Page 1

U.S. DEPARTMENT OF COMMERCE + + + + +

NATIONAL OCEANIC AND ATMOSPHERIC

ADMINISTRATION (NOAA)

+ + + + +

HYDROGRAPHIC SERVICES REVIEW PANEL (HSRP)

+ + + + + MEETING + + + + + WEDNESDAY MAY 4, 2011 + + + + +

The Hydrographic Services Review Panel met in the Kona Moku Ballroom at the Waikiki Beach Marriott Resort and Spa, 2552

Kalakaua Avenue, Honolulu, Hawaii, at 8:30 a.m., Edmund Welch, Chair, presiding. HSRP MEMBERS PRESENT: EDMUND B. WELCH, Chair MATTHEW WELLSLAGER, Vice Chair

LAWSON W. BRIGHAM, Ph.D. JEFFERY J. CAROTHERS MICHELE DIONNE, Ph.D. CAPT. SHERRI HICKMAN CAPT. THOMAS A. JACOBSEN DAVID A. JAY, Ph.D. GARY JEFFRESS, Ph.D.

JOYCE E. MILLER SCOTT R. PERKINS SUSAN SHINGLEDECKER

Page 2 PACIFIC NAVIGATION SERVICES STAKEHOLDER PANEL: CAPT. STEVE BAKER, Hawaii Pilots Association ROBIN BOND, Hawaiian Ocean Safety Team CAPT. BOB LAMB, Matson Navigation Company LT. DOUGLAS MILLER, U.S. Couast Guard, 14th Coast Guard District Waterways Management Branch BRAD RIMELL, Sause Brothers Ocean Towing Company ALSO PRESENT: RICHARD BALSER, U.S. Navy COMPACFLT JULIANA BLACKWELL, NOAA/National Geodetic Survey Director PAUL BRADLEY, NOAA/NOS ARTHUR BUTO, DLNR EDWARD CARLSON, NOAA/NGS VIRGINIA DENTLER, NOAA/HSRP BOB DUPUIS, Boat Surveys Hawaii RICHARD EDWING, NOAA/CO-OPS Director CAPT. GERD GLANG, NOAA/NOS LCDR MARCELLA GRANQUIST, Waterways Management Division, Sector Honolulu, U.S. Coast Guard LAURA HAMILTON, NOAA TIFFANY HOUSE, NOAA/HSRP Staff D. JOHNSON KRISTINA KEKUEWA, NOAA PSC DAVID M. KENNEDY, Asst. Administrator, NOS TORE LERAAND, Leraand Engineering Inc. CAPT. JOHN E. LOWELL, JR., NOAA/OCS Director JAY MAGERS, U.S. Navy JOHN MARRA, Ph.D., NOAA NCDC MICHAEL MacDONALD, Hawaiian Tug & Barge/Young Brothers DANIEL G. MORRIS, U.S. Navy COMPACFLT JESSICA PODOSKI, U.S. Army Corps of Engineers DAN POLHEMUS, U.S. Fish and Wildlife Service KEVIN RICHARD LT. KYLE RYAN, NOAA/OCS ALSO PRESENT (Cont'd):

Page 3

BRIAN SCHATZ, Lt. Governor, State of Hawai'i TOM SMITH, U.S. Army Corps of Engineers ADAM STEIN, NOAA PSC/Pacific Risk Management

'Ohana (PriMO)

DAVID SWATLAND, NOAA

BILL THOMAS, NOAA

KATHY WATSON, NOAA/HSRP Staff

Page 4 T-A-B-L-E O-F C-O-N-T-E-N-T-S Swearing in of New Members. . . . . . . . . . 9 Keynote Address The Honorable Brian Schatz. . . . . . 13 Welcoming Remarks and NOAA Update Challenges Facing NOAA and the HSRP Navigation Service Office Updates Capt. John E. Lowell, Office of Coast Juliana Blackwell, Richard Edwing, Center for Operational Pacific Navigation Services Stakeholder Panel Capt. Steve Baker, Capt. Bob Lamb, Robin Bond, Brad Rimmel, Sause Bros Ocean Towing Company . . . . 306 Lt. Douglas Miller, USCG, 14th Coast Guard District Identification of all NOAA personnel at 

T-A-B-L-E O-F C-O-N-T-E-N-T-S Public Comment Period David Swatland, Deputy Superintendent for Programs and Policy, Papahanaumokuakea Marine National Monument. . . . Daniel Morris, Geospatial Officer Commander and Chief of the 

|    | Page 6   |
|----|--|
| 1  | P-R-O-C-E-E-D-I-N-G-S                          |
| 2  | 8:47 a.m.                                      |
| 3  | CHAIR WELCH: Ladies and                        |
| 4  | gentlemen. Good morning. Let's convene the     |
| 5  | Hydrographic Services Review Panel of the      |
| 6  | National Oceanic & Atmospheric Administration. |
| 7  | I'm Ed Welch the Panel Chairman.               |
| 8  | This is an advisory committee created by       |
| 9  | statute of folks in the private sector from    |
| 10 | all over the country. And our job is to        |
| 11 | advise NOAA and NOAA's leadership on a number  |
| 12 | of navigation and contract services programs.  |
| 13 | This is the first official meeting             |
| 14 | that we had since the appointment of a new     |
| 15 | cadre of members. Some of us have been on the  |
| 16 | panel for several terms, several years. A      |
| 17 | number of the rest of us are attending our     |
| 18 | first official meeting.                        |
| 19 | I'm going to turn it over to our               |
| 20 | Designated Federal Official, Captain Lowell    |
| 21 | for a few remarks and then we're going to go   |
| 22 | right to the Lieutenant Governor.              |

Page 7 1 John? 2 CAPT. LOWELL: Thank you, Ed. I know most everybody here. Some guests I 3 haven't met. I tried to meet everybody. 4 5 Again, I'm Captain John Lowell. I'm Director of the Office of Coast Survey. 6 7 We have a couple of administrative 8 things to go over and then we'll move right 9 into the meeting. 10 First off, these are the emergency exits behind us. Everybody's recommended to 11 12 use the stairs to get out of here, just move down those stairs. 13 14 The restrooms are located right across from the stairs. 15 The mics are a little bit 16 17 different for this meeting. They're always Our sound engineer will be adjusting the 18 on. 19 controls as we speak. So if there's a slight 20 delay, it's just that he hasn't done it yet. 21 You're not supposed to push the top on this 22 one.

|    | Page 8   |
|----|--|
| 1  | But to facilitate him, you know do             |
| 2  | try to lean toward the mic so that he picks    |
| 3  | up. We do have a court reporter at the table,  |
| 4  | so we're recording everything and taking       |
| 5  | notes. As always, speak slowly and clearly.    |
| 6  | And I haven't seen this problem.               |
| 7  | At this meeting we're going to try not to talk |
| 8  | over each, as been known to happen.            |
| 9  | As Ed said, this is the first                  |
| 10 | Pacific Regional meeting for the Hydrographic  |
| 11 | Services Review Panel. As Ed said, it's an     |
| 12 | independent panel. We have individuals with    |
| 13 | diverse background and interests in those      |
| 14 | hydrographic services.                         |
| 15 | We welcome you all here. There are             |
| 16 | ten new members on the Panel, of which this is |
| 17 | their first meeting. So we'll try to walk      |
| 18 | everybody through the process here.            |
| 19 | We also have a couple of special               |
| 20 | sessions dealing with where is this committee  |
| 21 | want to go over the next three to four years.  |
| 22 | We'll talk a little bit about that today and   |

Page 9 1 then after we've gone through the meeting and 2 all new members will understand how we run the 3 meetings, then at the very end of the last day 4 we'll give everybody an opportunity to kind of 5 set the stage for the next several meetings. Where do you want to go and how it is we can 6 7 help you gather the information to meet that 8 objective that you've set for yourselves. 9 We also will be swearing two new 10 members in that we didn't get to a few months 11 ago in Silver Spring. We'll do that right 12 after these remarks. 13 And a quick reminder to the guests 14 in the back if you have not signed in, we have a sign in sheet that's required by FACA law. 15 16 So, please sign in. 17 So, with that said, I think we can 18 move to the swearing in. David Kennedy, you 19 want to just 20 That would be great. MR. KENNEDY: 21 But let's see, who are we swearing in? 22 CAPT. LOWELL: Susan and David.

|    | Page 10  |
|----|--|
| 1  | MR. KENNEDY: So just read it and               |
| 2  | they just follow along with me?                |
| 3  | MS. WATSON: And raise your right               |
| 4  | hand.  |
| 5  | CAPT. LOWELL: Raise your right                 |
| 6  | hand.  |
| 7  | MR. KENNEDY: This is unique for                |
| 8  | me. I've had a bunch of new experiences        |
| 9  | lately. And I've been sworn out a lot. So,     |
| 10 | all these new experiences.                     |
| 11 | All right. So you two, if you'd                |
| 12 | raise your right hand and then we'll go        |
| 13 | through this oath.                             |
| 14 | And it's I, you two do you have                |
| 15 | it in front of you to read it. Okay. Let's     |
| 16 | read it together.                              |
| 17 | Do solemnly swear or affirm that I             |
| 18 | will support and defend the Constitution of    |
| 19 | the United States against all enemies, foreign |
| 20 | and domestic, that I will bear true faith and  |
| 21 | allegiance to the same; that I take this       |
| 22 | obligation freely, without any mental          |

|    | Page 11  |
|----|--|
| 1  | reservation or purpose of evasion; and that I  |
| 2  | will well and faithfully discharge the duties  |
| 3  | of the office on which I am about to enter. so |
| 4  | help me God.                                   |
| 5  | Okay. That means you're                        |
| 6  | officially sworn in. Congratulations.          |
| 7  | So, I turn it back to you.                     |
| 8  | CHAIR WELCH: Thank you, David.                 |
| 9  | And congratulations to our new                 |
| 10 | members. Welcome to all of our members, again. |
| 11 | We are delighted to have as our                |
| 12 | first speaker the Honorable Brian Schatz is    |
| 13 | Lieutenant Governor of Hawaii.                 |
| 14 | Mr. Lieutenant Governor, we very               |
| 15 | much appreciate you coming. I've been on this  |
| 16 | Panel about four years and we've been meeting  |
| 17 | in various states around the country. And      |
| 18 | while we've had a number of state cabinet      |
| 19 | secretaries and other dignitaries from the     |
| 20 | state governments, I believe you're the        |
| 21 | highest ranking state official that we have    |
| 22 | had make a presentation to the Panel, at least |

Page 12 1 during my tenure. So we very much appreciate 2 it. As we indicated to you, those of 3 us here come from a diverse group of 4 5 occupations and backgrounds. Some of us are scientists, a couple of us are politicos. 6 We 7 have some maritime pilots. Some folks with 8 various types of maritime and geodetic types 9 of backgrounds. And we've been attracted to 10 come to Hawaii because of its unique situation. It's an island state. 11 Tt's 12 positioned in a strategic part of the Pacific Ocean. And a number of the NOAA programs that 13 14 we have some responsibility to comment on are 15 of importance to Hawaii. And I understand that there are 16 17 several hundred NOAA employees that actually live and work in the State of Hawaii. 18 19 So with that, we would welcome any 20 kind of remarks that you might care to give 21 And if time permits, perhaps some of us us. 22 can react to your remarks or pose a question

|    | Page 13  |
|----|--|
| 1  | to you.  |
| 2  | So the floor is yours. Thank you.              |
| 3  | LT. GOVERNOR SCHATZ: Well, thank               |
| 4  | you, Chair Ed Welch.                           |
| 5  | Thank you Assistant Administrator              |
| 6  | Kennedy and Captain John Lowell and to all the |
| 7  | members of this Panel. Thank you. Aloha e      |
| 8  | komo mai, welcome to Hawaii.                   |
| 9  | I see your schedule, your agenda,              |
| 10 | which is robust and that's appropriate. But I  |
| 11 | hope you can complete your work in time for    |
| 12 | some enjoyment of the natural environment      |
| 13 | here, and maybe even some enjoyment of the     |
| 14 | retail environment here, which is equally      |
| 15 | important to us.                               |
| 16 | The work you will undertake in the             |
| 17 | next couple of days is vitally important for   |
| 18 | Hawaii. And on behalf of Governor Abercrombie  |
| 19 | I'd like to thank you for your critical work   |
| 20 | in ensuring marine transportation.             |
| 21 | I'd also like to thank NOAA for                |
| 22 | selecting Hawaii for this location and giving  |
|    |  |

| <pre>stakeholders an opportunity to participate.<br/>We're grateful to NOAA for the far-reaching<br/>services provided, including information,<br/>tsunami early warning and monitoring coral</pre> | ge 14 |
|---|-------|
| 2 We're grateful to NOAA for the far-reaching<br>3 services provided, including information,<br>4 tsunami early warning and monitoring coral  |       |
| <pre>3 services provided, including information,<br/>4 tsunami early warning and monitoring coral</pre>   |       |
| 4 tsunami early warning and monitoring coral  |       |
|   |       |
|   |       |
| 5 reef and fisheries management, seafood  |       |
| 6 inspections, the management of the Hawaiian   |       |
| 7 Islands' humpback whale sanctuary and the   |       |
| 8 Papahanaumokuakea Marine Monument.  |       |
| 9 NOAA is a valued partner in   |       |
| 10 Hawaii. It's critically important in our   |       |
| 11 island state. And as you had mentioned, it's   |       |
| 12 a major employer in the State of Hawaii.   |       |
| 13 Several hundred employees and growing as a   |       |
| 14 result of our needs, as a result of our unique   | 9     |
| 15 natural environment and partly as a result of  |       |
| 16 Senator Inouye's leadership.   |       |
| 17 You may not know that I was at th  | 9     |
| 18 University of Hawaii's Sea Grant Extension   |       |
| 19 Service, and that's how I got my start in  |       |
| 20 public service. I was a program assistant.   |       |
| 21 And I started a not for profit called Youth  |       |
| 22 For Environmental Service designed to get kid  | 5     |

|    | Page 15  |
|----|--|
| 1  | involved in community service for the          |
| 2  | environment. In this way it's a small example  |
| 3  | of the significant and important role that     |
| 4  | NOAA plays in ensuring economic vitality and   |
| 5  | environmental protection through science.      |
| 6  | When I was asked to address you,               |
| 7  | of course like most folks, I didn't fully      |
| 8  | understand how nautical charts, shoreline      |
| 9  | surveys and water level measurements and       |
| 10 | geodetic and geospatial measurements were      |
| 11 | developed. Of course, I understood the         |
| 12 | importance of accurate charts, information on  |
| 13 | tides, water levels and good data for          |
| 14 | positioning services and so on. But now I      |
| 15 | more fully understand and appreciate how the   |
| 16 | network of NOAA professionals, state and local |
| 17 | government agencies, scientists, businesses    |
| 18 | and private citizens work together to ensure   |
| 19 | that the data that we collect is relevant to   |
| 20 | support to support the United States marine    |
| 21 | transportation system and the prosperity of    |
| 22 | our country.                                   |

|    | Page 1   |
|----|--|
| 1  | And we were chatting a little bit              |
| 2  | earlier this morning, this is exactly the kind |
| 3  | of work that in my opinion is under siege with |
| 4  | respect to budgets. Because as even at the     |
| 5  | state legislature right now, and I've been a   |
| 6  | legislator, and you've been a staff director   |
| 7  | for a congressman and I think the challenge    |
| 8  | for this Panel and the services that are       |
| 9  | provided is that you may end up in a           |
| 10 | conference committee and they're trying to     |
| 11 | find some dollar amount of savings. And they   |
| 12 | look across the table at each other and they   |
| 13 | say "What's that? I don't know," and it gets   |
| 14 | crossed out.                                   |
| 15 | And so the challenge today and for             |
| 16 | the next several days is to do your work, but  |
| 17 | also to understand that in an economic and     |
| 18 | political environment in which we're working   |
| 19 | that it's really critical to do more reaching  |
| 20 | out then ever about why what you're doing is   |
| 21 | so important. How it creates a stronger        |
| 22 | economy. How it creates efficiency. How it     |

## 16

Page 17 1 creates safety. How it saves people time. How 2 it saves companies time and how it save companies fuel. How it basically is one of the 3 most basic parts of America's economic 4 5 infrastructure. And we've got to make that 6 case loud and clear, because this is exactly 7 the kind of thing that is going to sound 8 abstract and arcane to a policymaker and will 9 be threatened. 10 And I don't mean that as an ideological statement. I think it's just a 11 12 factual statement that this is the kind of thing people don't understand. And I'll give 13 14 you another example at the state level. 15 I remember being in a committee 16 when they were trying to find \$750,000 of 17 savings at the state legislature. And two legislators looked at each other and said: 18 19 "What's vector control?" And, "I don't know, 20 I don't know." Cross. 21 So then I kind of came in and 22 said: "You know what vector control is,

Page 18 right? Dengue fever eradication, rats in 1 2 restaurants. Vector control is pretty basic 3 to what government does." And so we were able to reinsert it in the budget. But a lot of 4 5 policy making, especially on the budget level, especially in a rush which is almost always 6 7 how it's done, gets done with very little 8 information. And you're not going to be able 9 to get in the room at the last minute, maybe 10 you will but the rest of us are not going to be able to get in the room at the last minute. 11 12 And so those of you in the private sector, those of you who are pilots, those of you who 13 14 understand the economics of maritime 15 transportation and other aspects of how this 16 Panel services not just the maritime industry, 17 but the broader public that's the case we have 18 to make to our friends in Washington and to our local partners. 19 20 So, I want to thank you for the 21 work you do, because I really do think it's 22 totally critical. And that's actually the

|    | Page 19  |
|----|--|
| 1  | reason you say well, I'm one of the higher     |
| 2  | ranking public officials to come to this       |
| 3  | meeting, I think it's critical that we do have |
| 4  | public leaders who understand applied science  |
| 5  | matters, that infrastructure matters and that  |
| 6  | just because something doesn't sound good in   |
| 7  | a campaign commercial doesn't mean it's not    |
| 8  | important. And that's why I'm here, is to      |
| 9  | support the work you're doing and to say thank |
| 10 | you for the work you're doing, and to ask you  |
| 11 | to speed an extra couple of hundred bucks each |
| 12 | in the stores.                                 |
| 13 | Thank you very much. I'd be happy              |
| 14 | to answer any questions, although I lack the   |
| 15 | expertise to answer many of them.              |
| 16 | CHAIR WELCH: Well, thank you very              |
| 17 | much, Mr. Lieutenant Governor.                 |
| 18 | And let me open the panel oven and             |
| 19 | see if any comments or questions from members  |
| 20 | of the Panel. If you do, would you please not  |
| 21 | only state who you are, but what your          |
| 22 | affiliation is or where you're from.           |

|    | Page 20  |
|----|--|
| 1  | Do we have any comments or                     |
| 2  | questions? Well, let me break the ice, Mr.     |
| 3  | Lieutenant Governor.                           |
| 4  | I was here in Hawaii about two                 |
| 5  | months ago, the Big Island, for a family       |
| 6  | wedding. My sister-in-law, who is a Hawaiian   |
| 7  | resident was getting married. And we had a     |
| 8  | nice wedding at a facility a little bit south  |
| 9  | of Kalua Kona right on the waterfront. And two |
| 10 | weeks later the facility was absolutely        |
| 11 | devastated by the tsunami. And if we had       |
| 12 | waited two more weeks, we wouldn't have had    |
| 13 | that wedding there.                            |
| 14 | But I wonder if you might have any             |
| 15 | comments as to, you know obviously most people |
| 16 | didn't even know that Hawaii got hit by the    |
| 17 | tsunami. Do you have some comments or          |
| 18 | observations about the economic impacts of     |
| 19 | that event here and to what extent you had     |
| 20 | warnings and plans?                            |
| 21 | LT. GOVERNOR SCHATZ: Well, the                 |
| 22 | Pacific Tsunami Warning Center got it exactly  |
|    |  |

|    | Page 21  |
|----|--|
| 1  | right. From the time of the tsunami's arrival  |
| 2  | to the impact, although they were vague enough |
| 3  | to keep the public alert and aware. From the   |
| 4  | Emergency Operating Center we were in constant |
| 5  | contact with them. We were working with FEMA   |
| 6  | and the Warning Center and everything really   |
| 7  | worked well. The only thing that didn't work   |
| 8  | perfectly was our teleconferencing, our        |
| 9  | virtual teleconferencing system. And I think   |
| 10 | that was human error. We just didn't know      |
| 11 | where to place microphones, sort of like your  |
| 12 | push to talk system. But for the most part we  |
| 13 | felt very good about being able to             |
| 14 | especially with a new Governor and three new   |
| 15 | Mayors. We felt very good about being able to  |
| 16 | stand up a system where we were in constant    |
| 17 | contact and we were monitoring the impact. So  |
| 18 | on that level I thought things went well.      |
| 19 | On the level of impact to the                  |
| 20 | State of Hawaii, we had \$20 to \$30 million   |
| 21 | worth of infrastructure damage, \$8 million of |
| 22 | which was to public facilities. And we'll be   |

Page 22 1 getting FEMA assistance for that. 2 There were some significant damage at harbors and a bunch of private property 3 FEMA's not going to be helping with 4 damage. that because most of the private properties 5 were either insured or second homes, which 6 7 FEMA's disinclined to assist with for 8 understandable reasons. 9 The main economic impact has been 10 the understandable downturn in Japanese 11 arrivals. We depend on that as part of our 12 tourism mix, but it is only 18 percent of our total arrivals. So we had a, call it a 25 13 14 percent drop off of 18 percent. So if you do 15 the math, it's a 2 or 3 percent net drop for 16 a three month period and it's starting to pick 17 right back up. 18 So, you know you're probably 19 looking at a total loss in gross state product 20 of less than a percentage point, but not 21 inconsiderable. I mean, that's real money and 22 economic activity.

|    | Page 23  |
|----|--|
| 1  | We feel very confident that the                |
| 2  | Japanese market will recover. We feel          |
| 3  | confident that our relationship with Japan is  |
| 4  | stronger then ever. And so Hawaii's economy,   |
| 5  | actually, was on a nice trajectory until a     |
| 6  | couple of months ago. We have one of the       |
| 7  | lower unemployment rates in the country as a   |
| 8  | state. And we're relatively, knock on wood,    |
| 9  | stable. So we're feeling positive, although    |
| 10 | that doesn't solve our short term, budget      |
| 11 | shortfall, which is about \$1.3 billion. So we |
| 12 | just are finalizing work on the legislative    |
| 13 | budget tomorrow. And my view is the private    |
| 14 | sector will recover by the end of this year,   |
| 15 | and the public sector will recover about a     |
| 16 | year after that.                               |
| 17 | CHAIR WELCH: Are you anticipating              |
| 18 | a drop in arrivals of people that won't go     |
| 19 | over to the birth certificate?                 |
| 20 | Joyce?   |
| 21 | MEMBER MILLER: Yes, I have a                   |
| 22 | follow-up question. I'm a resident of          |

Page 24 CHAIR WELCH: On the birth 1 2 certificate? 3 MEMBER MILLER: No. 4 CHAIR WELCH: Joyce, if you can 5 identify yourself? MEMBER MILLER: Yes. I'm Joyce 6 7 Miller. I work for the Joint Institute for 8 Marine and Atmospheric Research, RCUH and I'm 9 a Panel member, recently joined. 10 And what are the state plans, I mean the Keehi Harbor in particular was 11 12 severely impacted? And I have to say having 13 been a boater here for many years, it never 14 was in the best condition anyway. 15 LT. GOVERNOR SCHATZ: Right. 16 MEMBER MILLER: So what are the 17 state plans for renovation of that harbor? 18 Are we getting FEMA money? What's the --19 LT. GOVERNOR SCHATZ: We are. We 20 are. So the FEMA money reimburses for public 21 infrastructure damage. And the estimate was 22 \$1.4 million in Keehi. And so what that'll do

| 1  | Page 25                                       |
|----|---|
| 1  | is get us back to where we were, which as you |
| 2  | know was unacceptable.                        |
| 3  | MEMBER MILLER: Right.                         |
| 4  | LT. GOVERNOR SCHATZ: So I think,              |
| 5  | our new Department of Land and Natural        |
| 6  | Resources Director is a former harbor master. |
| 7  | And so I think he understands better than,    |
| 8  | perhaps, any other DLNR chief the need for    |
| 9  | investment in harbors.                        |
| 10 | And the other thing we're doing is            |
| 11 | trying to have our Department of              |
| 12 | Transportation and Department of Land work a  |
| 13 | little bit better together on harbor          |
| 14 | infrastructure. Because our Transportation    |
| 15 | Department is fat and our DLNR is starving.   |
| 16 | And so I think, you know trying to make sure  |
| 17 | that there's partnership there will free up   |
| 18 | some resources for that infrastructure.       |
| 19 | CHAIR WELCH: Yes, David?                      |
| 20 | MEMBER JAY: Yes. David Jay,                   |
| 21 | Portland State University.                    |
| 22 | As an academic scientist, this is             |

Page 26 1 more sort of a plug than a question. You have 2 here at the University of Hawaii a very important called the University of Hawaii Sea 3 Level Center. I was curious, is there direct 4 state support for that activity? It's very 5 6 important for people who study sea level and 7 tides around the world. 8 LT. GOVERNOR SCHATZ: The way that 9 our university is funded is basically by block 10 appropriations. Because the University has constitutional autonomy, the Legislature 11 12 basically provides them a fixed amount of money and then the President and the 13 14 Chancellors determine which programs get funded. But as a general proposition, you know 15 David and I were talking this morning about 16 17 the importance of those kinds of data and that Hawaii continues to be a leader in some areas 18 19 and a potential leader in others. And so one 20 of the things we're going to be working on is separating out the question of global climate 21 22 change and getting off of oil no matter what

|    | Page 27  |
|----|--|
| 1  | happens. Even if we get off oil tomorrow       |
| 2  | morning, we're going to have deal with some    |
| 3  | sea level rise as a coastal state. And so      |
| 4  | what we're going to be doing is working with   |
| 5  | our University partners to develop an          |
| 6  | infrastructure plan for both private and       |
| 7  | public property so that we can actually deal   |
| 8  | with this.                                     |
| 9  | And I think because we're a                    |
| 10 | coastal state we can't afford to wait.         |
| 11 | CHAIR WELCH: Okay. Gary                        |
| 12 | Jeffress?                                      |
| 13 | MEMBER JEFFRESS: Gary Jeffress,                |
| 14 | Texas A&M University, Corpus Christi.          |
| 15 | I think you just answered my                   |
| 16 | question I was going to ask. I was going to    |
| 17 | ask about long-term sea level rise and also    |
| 18 | storm surges from hurricanes, how that impacts |
| 19 | low-lying coastal areas and Hawaii's policy in |
| 20 | the future.                                    |
| 21 | LT. GOVERNOR SCHATZ: Yes. You                  |
| 22 | know, I think I did answer that, but I'll say  |

|    | Page 28  |
|----|--|
| 1  | more broadly we may be ahead of other states   |
| 2  | and counties and municipalities, but that      |
| 3  | doesn't matter, does it? The question is       |
| 4  | whether we're going to have a plan in time to  |
| 5  | finance and implement so if it's hardening, if |
| б  | it's managing I mean, I don't know             |
| 7  | technically what the plan ought to be, but I   |
| 8  | do know that I don't want to be developing a   |
| 9  | plan as the problem is fully upon us.          |
| 10 | CHAIR WELCH: Other comments or                 |
| 11 | questions? Michele?                            |
| 12 | MEMBER DIONNE: Michele Dionne,                 |
| 13 | Wells National Estuarine Research Reserve in   |
| 14 | Wells, Maine.                                  |
| 15 | Just a follow-up, and that is                  |
| 16 | maybe you could comment on how the citizens of |
| 17 | Hawaii embrace this problem of sea level rise  |
| 18 | and whether they're thinking about it, not     |
| 19 | thinking about, aware of it kind of.           |
| 20 | LT. GOVERNOR SCHATZ: I think the               |
| 21 | answer is that Hawaii as a general proposition |
| 22 | has a high level of environmental awareness.   |

|    | Page 29  |
|----|--|
| 1  | But I think if you ask the person on the       |
| 2  | street about sea level rise, you'd get a blank |
| 3  | stare, even from those who call themselves     |
| 4  | environmentalists. There's a concern about     |
| 5  | land development and the sort of right in      |
| 6  | front of you challenges with respect to        |
| 7  | balancing the natural resources need versus    |
| 8  | the need for housing and hotel and resort      |
| 9  | development; all those questions are sort of   |
| 10 | more right in front of us.                     |
| 11 | I don't think our community at                 |
| 12 | large is educated about or concerned about     |
| 13 | this problem. And, frankly, one of the other   |
| 14 | challenges is that with an economy that is so  |
| 15 | dependent on tourism, we want to be preparing  |
| 16 | for this but we don't want to be sending out   |
| 17 | the wrong signals internationally. And here's  |
| 18 | been so much reticence about even I mean I     |
| 19 | actually agree with that. I don't think we     |
| 20 | should be making international news with       |
| 21 | respect to this question. But that doesn't     |
| 22 | prevent us from doing the work we need to do.  |

| Page 30                                       |
|---|
| It just means we shouldn't be you know, if    |
| someone asks us about it, we can be truthful  |
| but there's no need for a news release.       |
| So, I think what we've done in the            |
| interest of continuing Hawaii's great brand   |
| from a hospitality standpoint is sort of      |
| shutdown all activity on this question. And   |
| I think there's a happy medium that we've got |
| to get to.                                    |
| Well, thank you very much. I                  |
| appreciate your work. I'm sorry I have to go  |
| back to the capital. But I really appreciate  |
| you being here. Thanks very much.             |
| CHAIR WELCH: Thank you, Mr.                   |
| Lieutenant Governor.                          |
| (Applause.)                                   |
| CHAIR WELCH: Captain Lowell would             |
| like to give you a short presentation here.   |
| CAPT. LOWELL: I just have a                   |
| little gift coming down. Thank you very much. |
| I guess the Chair just left.                  |
| MS. WATSON: Captain, excuse me.               |
|   |

|    | Page 31  |
|----|--|
| 1  | I think we forgot one thing on the agenda' to  |
| 2  | have all the Panel members give a brief who    |
| 3  | they are.                                      |
| 4  | CAPT. LOWELL: I actually have                  |
| 5  | that right after the                           |
| 6  | MS. WATSON: Okay. That's fine.                 |
| 7  | Okay.  |
| 8  | CAPT. LOWELL: Actually, as a                   |
| 9  | final note to both Susan and Dave, there is a  |
| 10 | little paperwork that we have to do, but at    |
| 11 | the next break, I'll pull you guys aside and   |
| 12 | we'll finish that.                             |
| 13 | So that said, Dave Kennedy.                    |
| 14 | MR. KENNEDY: Okay. Sorry for                   |
| 15 | wandering off. I thought we were going to do   |
| 16 | some other business.                           |
| 17 | So I had the opportunity to talk               |
| 18 | with the Lieutenant Governor this morning, and |
| 19 | very impressed by his understanding of what's  |
| 20 | going on here and his willingness to support.  |
| 21 | When I first sat down with him, he             |
| 22 | kind of asked some questions. I said huh, I    |
|    |  |

Page 32 1 don't think he's going to get this. He had 2 read the material. But, boy, as soon as we started to talk and talk about particular 3 issues, it just clicked and he started giving 4 5 me examples of how important some of the nav 6 services issues are to Hawaii and how 7 important they are to the economy. So, really 8 impressed to have the opportunity to sit down 9 with him, and really I think an advocate for 10 us as we move forward. So I have a slide deck here 11 12 somewhere; do I not? No? Okay. Interesting. A lot of people looking at each other here. I 13 14 don't know. 15 So, what I'm going to talk about this morning a little bit is kind of the 16 17 atmosphere that we have as an environment to work in in NOAA nationally, the challenges. 18 19 How we think you guys fit into all of that, 20 and we do think you fit. And we're hoping that we can entice you to maybe be engaged 21 22 between meetings in a little more active way

| 1  |   |
|----|---|
|    | Page 3  |
| 1  | then you have in the past. The Governor got   |
| 2  | a good pitch in there for that. He and I      |
| 3  | chatting this morning he was kind of asking   |
| 4  | okay, so what is this Committee and what does |
| 5  | it do. And when I just mentioned, and that's  |
| 6  | kind of what I liked about him so much. He's  |
| 7  | such a quick study. When I just mentioned     |
| 8  | that, boy, this is a group that we think that |
| 9  | there's other opportunity, he immediately got |
| 10 | that and said, gosh, given the environment    |
| 11 | we're in, yes, yes, yes. And I'd like to talk |
| 12 | about that, too.                              |
| 13 | At any rate, so my slides, should             |
| 14 | we get them up, would kind of start with the  |
| 15 | environment that we're working in. And as you |
| 16 | all are extremely aware, budget, budget,      |
| 17 | budget. And so we have been struggling for    |
| 18 | months and months and months under this       |
| 19 | continuing resolution. We finally now have a  |
| 20 | stable budget for '11. And there were a       |
| 21 | number of draconian scenarios about what our  |
| 22 | budget might end up being for '11. And I'm    |

3

Page 34 very happy to say that most of those did not 1 2 play out. 3 So the budget that we have to work with, which is not final so I really can't 4 5 talk about it in detail, but at least the overall number and where we think we're going 6 7 to go if we get approval is not nearly as bad 8 as we thought it might be. So it is somewhat 9 stable. There aren't going to be any major increases, but I think the best good news of 10 all of that is that we're not going to have to 11 12 cut big chunks out of programs. We're going to be able to continue to do pretty much what 13 14 our primary basic missions are and will allow 15 us, at least this year, to be somewhat stable, 16 and certainly not take dramatic cuts. 17 Another part of that issue, 18 though, is okay what happens next year? 19 Conventional wisdom is that we had 20 presidential budget for '12, but that budget 21 we don't think probably will stand. It was a 22 pretty favorable budget for NOS, but we don't

|    | Page 35  |
|----|--|
| 1  | think that's where we'll start. We think that  |
| 2  | ultimately the kind of budget that we'll have  |
| 3  | probably will begin as a baseline with what we |
| 4  | ended up getting here this year, which is less |
| 5  | than certainly we had intended for '11 and     |
| 6  | certainly less then what was projected in the  |
| 7  | President's budget for '12.                    |
| 8  | I think, let's face it: economic               |
| 9  | budget woes will continue for the next few     |
| 10 | years. So two things:                          |
| 11 | (1) What we're striving to do is               |
| 12 | make sure that what the National Ocean Service |
| 13 | does, in particular the Navigation Services,   |
| 14 | we really try very hard to project as how      |
| 15 | important they are to the economy, how         |
| 16 | important they are to moving the nation        |
| 17 | forward in jobs and what have you. We're       |
| 18 | doing a fair amount of kind of rethinking some |
| 19 | of the messages that we are passing on to      |
| 20 | Congress, in particular about Nav Services     |
| 21 | with the hope that we can at least remain      |
| 22 | neutral, stable. It'd be great to have a       |

| 1  |  |
|----|--|
|    | Page 36  |
| 1  | little increase, whether that will happen or   |
| 2  | not, I don't know. But times are going to be   |
| 3  | tough. And so right now, the signals are that  |
| 4  | we're okay. We're hoping to keep it going that |
| 5  | way.   |
| 6  | Now that having been said, I think             |
| 7  | there's some major drivers and some of those   |
| 8  | that directly affect you that are very         |
| 9  | favorable in particular to National Ocean      |
| 10 | Service but to the Nav Services, that I think  |
| 11 | will help us maintain our position and maybe   |
| 12 | not have to continue to think about taking     |
| 13 | significant cuts.                              |
| 14 | And so they would fall into the                |
| 15 | categories of the new National Ocean Policy,   |
| 16 | which I'm sure most of you are aware of. That  |
| 17 | Ocean Policy has nine primary objectives.      |
| 18 | Several of those objectives which are          |
| 19 | currently having strategic plans developed are |
| 20 | very specific to the Nav Services side of the  |
| 21 | house. So, three that I can think that were on |
| 22 | my slides, I think, are                        |
|    | Page 37  |
|----|--|
| 1  | MS. DENTLER: If you want to read               |
| 2  | through them, then we can do that.             |
| 3  | MR. KENNEDY: What's that?                      |
| 4  | MS. DENTLER: If you want to read               |
| 5  | through like this. I've got to troubleshoot,   |
| 6  | but you can do the presentation.               |
| 7  | MR. KENNEDY: Okay. Well, I mean,               |
| 8  | we can kind of see that.                       |
| 9  | So, can you go to the next one?                |
| 10 | Let's see where we are in my talk. I think     |
| 11 | I've kind of covered that, the challenge of    |
| 12 | appropriations issue and the fact that '11, we |
| 13 | have something now to work with, not           |
| 14 | finalized, but to work with. And then '12, we  |
| 15 | don't where we're going to go. But I think     |
| 16 | the big battle to win is not having the        |
| 17 | discussion continue along the lines of let's   |
| 18 | cut a whole much more, but let's stabilize     |
| 19 | where we are.                                  |
| 20 | So, next. Let's see where I am                 |
| 21 | here. Yes. Gosh, I was kind of following the   |
| 22 | format, too.                                   |

|    | Page 38  |
|----|--|
| 1  | So in terms of opportunities, I                |
| 2  | had started with the Ocean Policy, but just to |
| 3  | back up for a second, NOAA has over the last   |
| 4  | couple of years developed a new strategic      |
| 5  | plan. And in developing that plan it kind of   |
| 6  | changed from what we used to do, and what its  |
| 7  | done is created a particular goal. It's        |
| 8  | called a coastal goal within NOAA which is the |
| 9  | basis for budget formulation as we move        |
| 10 | forward into the out years.                    |
| 11 | The National Ocean Service has not             |
| 12 | had its own goal for some period of time.      |
| 13 | We've been kind of blended into a theme called |
| 14 | ecosystem. Maybe not fair to say we have our   |
| 15 | own goal, because we did have our nav goal.    |
| 16 | But we've not had kind of a major goal within  |
| 17 | NOS that was really our own to manage and that |
| 18 | ultimately, when you got done with formulating |
| 19 | the budget, the Assistant Administrator, me,   |
| 20 | had kind of the final say in what went forward |
| 21 | to NOAA. We now have that in this coastal      |
| 22 | goal.  |

|    | Page 39  |
|----|--|
| 1  | You see the objectives on the left             |
| 2  | that really, then, are the basis for how we    |
| 3  | formulate to propose dollars to NOAA.          |
| 4  | And two things here: (1) There's               |
| 5  | some key objectives there listed on the left   |
| 6  | which we think match up pretty nicely with     |
| 7  | what Ocean Service and Nav Services are        |
| 8  | involved with. But the other nice thing as we  |
| 9  | develop this is that, as I mentioned before,   |
| 10 | that we have this Ocean Policy which has these |
| 11 | nine objectives, priority objectives. And      |
| 12 | when you look at our objectives within this    |
| 13 | coastal goal and then look at the Ocean Policy |
| 14 | priorities, they really match up very, very    |
| 15 | nicely. And I'm proud to say, that's on        |
| 16 | purpose. It wasn't just a fluke.               |
| 17 | And so what we're really hoping to             |
| 18 | do is take advantage of the fact that things   |
| 19 | that are pretty relevant within the Ocean      |
| 20 | Service that we consider objectives, we can    |
| 21 | match up very nicely with what the Ocean       |
| 22 | Policy is talking about.                       |

|    | Page 40  |
|----|--|
| 1  | So Marine Spatial Planning, as I               |
| 2  | mentioned, you've got the ocean coastal and    |
| 3  | Great Lakes observations mapping and           |
| 4  | infrastructure. Extremely relevant to us, and  |
| 5  | in particular this group today.                |
| 6  | And then changing conditions in                |
| 7  | the Arctic. And I'm going to talk about each   |
| 8  | of these just a little bit.                    |
| 9  | So next, please.                               |
| 10 | So, you've probably all heard                  |
| 11 | about Coastal Marine Spatial Planning as an    |
| 12 | objective. That's a good news/bad news story.  |
| 13 | Good news in that an awful lot of              |
| 14 | what the Ocean Service does really kind of     |
| 15 | fits within this major objective on a variety  |
| 16 | of fronts. And, in fact, NOAA, in being        |
| 17 | involved in the Ocean Policy and Dr. Lubchenco |
| 18 | being at the table as part of the Ocean        |
| 19 | Council, took on the responsibility of Coastal |
| 20 | Marine Spatial Planning to be kind of driven,  |
| 21 | at least in part, within NOAA. And where       |
| 22 | Coastal Marine Spatial Planning resides in     |

|    | Page 41  |
|----|--|
| 1  | NOAA is in the National Ocean Service, which   |
| 2  | is the parent organization for the groups that |
| 3  | are here today.                                |
| 4  | So, we're a primary player there.              |
| 5  | And in essence, what spatial planning is all   |
| 6  | about is, you've got an ocean that is being    |
| 7  | more and more and more looked at for           |
| 8  | alternative uses, for new uses, for more       |
| 9  | recreation. It's a place that is extremely     |
| 10 | vulnerable and a tremendous interest in        |
| 11 | continued development of the ocean.            |
| 12 | The thought was, as we continue to             |
| 13 | develop the ocean, we need to get everybody    |
| 14 | around a table that has an interest, a mandate |
| 15 | or a particular aspect of the ocean that they  |
| 16 | have an expertise in to sit down and then,     |
| 17 | with the appropriate data, to try and make     |
| 18 | intelligent decisions about where we go in the |
| 19 | oceans with development.                       |
| 20 | One of the major examples that                 |
| 21 | we're seeing around the country that's kind of |
| 22 | a driver for all of this is alternative        |

|    | Page 42  |
|----|--|
| 1  | energy. And you probably heard about in        |
| 2  | particular in the Northeast but not restricted |
| 3  | there, the windmill farms for power            |
| 4  | generation. But you've also got wave,          |
| 5  | current, a variety of other types of issues.   |
| б  | So when you think about a whole                |
| 7  | new industry and when you think about          |
| 8  | alternative energy as a major thrust in this   |
| 9  | country, and then putting huge wind farms      |
| 10 | throughout the ocean and those have to be      |
| 11 | mapped up against where ships go, where        |
| 12 | fishing takes place, where petroleum           |
| 13 | exploration occurs; how is it that you're      |
| 14 | going to have all the appropriate data and the |
| 15 | right people at the table to make decisions    |
| 16 | about how to do that kind of siting? Just as   |
| 17 | one example.                                   |
| 18 | So I think it's an admirable                   |
| 19 | undertaking. Unfortunately, there's a fair     |
| 20 | amount of controversy around it. We can talk   |
| 21 | about that later, if you'd like. But in        |
| 22 | essence there's just a fairly large body of    |

|    | Page 43  |
|----|--|
| 1  | organizations, individuals, entities, Congress |
| 2  | that think this is just one more federal       |
| 3  | bureaucratic red tape zoning restriction type  |
| 4  | of activity and why would we want to do this.  |
| 5  | And so there's a fair amount of resistance and |
| б  | a steep learning curve in terms of what we're  |
| 7  | trying to do and why it makes sense to do it,  |
| 8  | but also a very organized group against.       |
| 9  | So, next slide.                                |
| 10 | Under Arctic, again kind of an                 |
| 11 | objective at the Ocean Council.                |
| 12 | NOAA recently has released its own             |
| 13 | Arctic Strategy. That was done in May. You     |
| 14 | see our goals on the left there: with a        |
| 15 | purpose. It may be a little bit hard to see.   |
| 16 | But everything from better                     |
| 17 | predictions of sea ice. And, of course, one    |
| 18 | of the major issues in the Arctic, as I'm sure |
| 19 | you're pretty much aware, is that we have a    |
| 20 | changing set of environmental conditions that, |
| 21 | in and of themselves, are a challenge and an   |
| 22 | issue to and understand and deal with, but are |

|    | Page 44  |
|----|--|
| 1  | also an opportunity in that, as sea ice leaves |
| 2  | the Arctic, that's the opportunity in that     |
| 3  | it leaves for shipping, for mineral            |
| 4  | petroleum exploration, for a variety of other  |
| 5  | reasons. Without the sea ice, there's all      |
| 6  | sorts of new thoughts as to how and what       |
| 7  | should be done in the Arctic. And tremendous   |
| 8  | challenges not only in understanding an area   |
| 9  | that is not well understood environmentally    |
| 10 | and scientifically, but also as it relates to  |
| 11 | if in fact we're going to commercially         |
| 12 | develop, if we're going to ship, if we're      |
| 13 | going to do the other types of commercial      |
| 14 | thinking, you've got to have the               |
| 15 | infrastructure which is where the Nav Services |
| 16 | side of the house comes in. And it really      |
| 17 | doesn't exist there, or it doesn't exist much. |
| 18 | So a key backbone to a lot of the              |
| 19 | thinking is how do we get the appropriate      |
| 20 | services in place? The charts, the tide and    |
| 21 | water levels, the geodetic positioning such    |
| 22 | that we're in a position then to safely and    |

|    | Page 45  |
|----|--|
| 1  | appropriately begin to move our way that way   |
| 2  | to look at what the Arctic has to provide      |
| 3  | without ice. So a major issue.                 |
| 4  | Next.  |
| 5  | We, the Nav Services part of the               |
| 6  | Ocean Service, have been looking at the        |
| 7  | Arctic, have understood for a long time how    |
| 8  | important some of the things that we bring to  |
| 9  | the table are. And so you see in the center    |
| 10 | there an actual kind of plan that we have in   |
| 11 | place for the Arctic. And just some of         |
| 12 | examples of some of the thinking that's gone   |
| 13 | into upgrading the shoreline data, where our   |
| 14 | tide and water level gaps are and what we need |
| 15 | to really begin to flesh out.                  |
| 16 | We are looking at doing more                   |
| 17 | surveying. The lower left is the survey plan   |
| 18 | with some surveys planned for, I think, it's   |
| 19 | Kotzebue Sound and, Lowell, you can help me    |
| 20 | here. John, where else?                        |
| 21 | CAPT. LOWELL: This year it's                   |
| 22 | Kotzebue and, I believe, the approaches to the |
|    |  |

|    | Page 46  |
|----|--|
| 1  | Kotzebue.                                      |
| 2  | MR. KENNEDY: Yes. Okay.                        |
| 3  | CAPT. LOWELL: I think I                        |
| 4  | mispronounced that.                            |
| 5  | MR. KENNEDY: And then there is a               |
| 6  | major effort underway in Alaska on GRAV-D.     |
| 7  | And a fair amount of work already been done.   |
| 8  | And, Juliana, I don't know if                  |
| 9  | you're going to talk about that later, but     |
| 10 | more work certainly planned for the near       |
| 11 | future.  |
| 12 | So we're trying to step up and                 |
| 13 | begin to provide some of that very, very       |
| 14 | important data. And I will say it: we don't    |
| 15 | have enough money to do all that. So this is   |
| 16 | one of those areas where we feel strategically |
| 17 | we're so important, yet we don't have enough   |
| 18 | to do what we need to do. And so we've very    |
| 19 | aggressively trying to look forward at least   |
| 20 | having some budget numbers in place, should    |
| 21 | anybody ask, that we could show in terms of    |
| 22 | what kind of investment we think we need to    |

|    | Page 47  |
|----|--|
| 1  | bring the Arctic up to speed.                  |
| 2  | Next.  |
| 3  | And just this is another one of                |
| 4  | those major priority objectives from the Ocean |
| 5  | Policy, but you look at what it's talking      |
| б  | about doing. Again, centerline to the kinds    |
| 7  | of things that we do and that we're only       |
| 8  | trying to do. So when you think about          |
| 9  | integrated ocean mapping as we are trying to   |
| 10 | pursue it, where it's map once and use         |
| 11 | multiple times, that fits very nicely with     |
| 12 | what they're doing. This whole strengthening   |
| 13 | and integrating of the obs and the data        |
| 14 | collection fits beautifully what we're trying  |
| 15 | to think about for Marine Spatial Planning.    |
| 16 | The backbone of spatial planning               |
| 17 | really needs to be having the appropriate data |
| 18 | to bring to the table with the right people.   |
| 19 | And if you don't have the data, you can get    |
| 20 | everybody at the table. But we've certainly    |
| 21 | had plenty of experience ourselves with that   |
| 22 | quite often doesn't lead in the right          |

|    | Page 48  |
|----|--|
| 1  | direction if you can't pull out the            |
| 2  | appropriate data to share with everyone as a   |
| 3  | basis for how you're going to talk and then    |
| 4  | make decisions.                                |
| 5  | Next.  |
| 6  | I talked about opportunities. I                |
| 7  | think there's others here. Some of these have  |
| 8  | been around for a long time and I don't know   |
| 9  | where they're going to go. But certainly this  |
| 10 | new National Export Initiative, it's run out   |
| 11 | of I think ITA in Department of Commerce.      |
| 12 | It's a major push to try and get us more       |
| 13 | globally engaged in trade and export.          |
| 14 | One of the things, though, that                |
| 15 | really at least was not part of the original   |
| 16 | initiative is, gosh, for the nation to be more |
| 17 | competitive, doesn't it need to have the       |
| 18 | appropriate Nav Services for those ships that  |
| 19 | are going to be coming in and out in that      |
| 20 | export/import to have the appropriate products |
| 21 | and services to get in and out efficiently and |
| 22 | effectively. So we've tried to add that to     |

Page 49 the discussion and the debate. And NOAA has 1 2 someone that's head of the MTS Committee who 3 is really trying to promote this as a component to that trade initiative. 4 5 Panama Canal Expansion is another interesting area. I was just down in Norfolk 6 7 a couple of week ago talking with folks there. 8 And Norfolk is sure gearing up to try and be 9 one of those ports that is competitive in the 10 middle of the new larger vessels that the Panama Canal Expansion is going to affect. 11 12 And so, again, this gets to critical products and services as a result of that expansion and 13 14 port development and how that's going to take 15 place and who are those ports that are going 16 to get the business. 17 Harbor Maintenance Trust Fund, a 18 lot of money. We've been trying to get at it 19 for a long time. I don't know if there's any 20 latest for what can or can't be done. But. 21 that would be an excellent way to expand the 22 investments that maritime trade and commerce

|    | Page 50  |
|----|--|
| 1  | needs to really have its ports and harbors do  |
| 2  | what it needs to do.                           |
| 3  | And then the last thing, and I've              |
| 4  | kind of referred to it as the economy and the  |
| 5  | role in terms of economy and trade and dollars |
| 6  | generated that the whole Navigation Services   |
| 7  | side of the house really generates. We've      |
| 8  | been spending a lot of time trying to generate |
| 9  | better numbers. There's some really great      |
| 10 | stories out there about what we do and how it  |
| 11 | affects dollar-wise what happens around the    |
| 12 | country.                                       |
| 13 | Next.  |
| 14 | And then finally, our strategy.                |
| 15 | As I said, the Governor's kind of already      |
| 16 | given the bottom-line pitch. But we need you   |
| 17 | guys to really make sure that we are aligned   |
| 18 | and supporting the priorities. That whole      |
| 19 | economic silo benefit thing is huge for us     |
| 20 | right now. So down in Norfolk meeting with     |
| 21 | the private sector and some of the maritime    |
| 22 | organizations, they talked about the benefit   |

|    | Page 51  |
|----|--|
| 1  | of our services and how important they were as |
| 2  | they expanded and developed. And I said, man,  |
| 3  | I want you as Exhibit A on the Hill with me    |
| 4  | very soon; are you willing to do that, and     |
| 5  | then he said, absolutely.                      |
| 6  | But that's really important for                |
| 7  | us. And the more we can tell that story, as    |
| 8  | the Governor was suggesting, the less, then,   |
| 9  | hopefully we will be looked as one of those    |
| 10 | that can be drawn through a budget.            |
| 11 | Again, we're working very hard to              |
| 12 | make sure that we're meeting the needs of the  |
| 13 | constituency, but I think that's what we need  |
| 14 | you guys for; are we really getting there?     |
| 15 | And then finally, this whole thing             |
| 16 | about Rich stakeholder support and the         |
| 17 | role that you can play. Extremely important    |
| 18 | for us.  |
| 19 | And I think that's it. Was there               |
| 20 | another slide or no?                           |
| 21 | MS. DENTLER: No, that's it.                    |
| 22 | MR. KENNEDY: Yes. That's it?                   |
|    |  |

Page 52 1 So I was supposed to start by 2 adding my welcome and thanks for all of you for being part of this group. I think it's 3 fantastic that we have the new members. 4 We 5 apologize for the length of time it's taken to 6 get there. A tremendous amount of work behind 7 the scenes to generate what was required to 8 bring the new people onboard. But welcome, 9 and thank you for your support. Look forward 10 to the next two days. So, with that, I don't know. 11 Do I 12 answer any questions now or do we keep going? Ed, what do we do? 13 14 CHAIR WELCH: I think we ought to 15 pepper you with questions. 16 MR. KENNEDY: Okay. 17 CHAIR WELCH: Well, first, thank you, David, for the overview. 18 19 MR. KENNEDY: Yes. 20 CHAIR WELCH: Let me start with a 21 question, and for those of you who are not 22 necessarily thinking about the federal

|    | Page 53  |
|----|--|
| 1  | government every day of your lives, the        |
| 2  | federal budget year runs from October the 1st  |
| 3  | through the next September the 30th. So when   |
| 4  | David says fiscal 2012, he means the budget    |
| 5  | and the funding that will start this coming    |
| 6  | October 1st and go until the end of the next   |
| 7  | September. And that's the budget where the     |
| 8  | President has proposed a budget but Congress   |
| 9  | hasn't acted on it yet and there certainly     |
| 10 | will be major debates about the fiscal '12     |
| 11 | budget.  |
| 12 | The fiscal '11 budget, which is                |
| 13 | the fiscal year we're currently in, is the one |
| 14 | that it took six months until just about six   |
| 15 | weeks ago for Congress and the President to    |
| 16 | come up with a compromise.                     |
| 17 | So when David says we did okay, we             |
| 18 | were more or less stable in the fiscal '11     |
| 19 | budget, that's what he was referring to. And   |
| 20 | the next budget will be debated over the next  |
| 21 | six months, or eight months or ten months. It  |
| 22 | should be done by October the 1st but if       |

Page 54 recent history is any prediction, it will last 1 2 longer than that. 3 But I have a budget question, David. 4 5 MR. KENNEDY: Yes. CHAIR WELCH: You indicated that 6 7 you still are waiting for the particulars of 8 the fiscal '11, the current fiscal '11 budget 9 \_ \_ 10 MR. KENNEDY: Yes. CHAIR WELCH: -- and what it means 11 to National Ocean Services and Nav Services. 12 But isn't that kind of an internal decision or 13 14 debate within NOAA as opposed to something that's being acted on up at the Hill. 15 The Hill and the President have done their thing. 16 17 MR. KENNEDY: Well, here's the 18 problem. It is an internal discussion, and 19 has been. We've had a number to work with and 20 NOAA has parsed out to the Hawaiian offices, 21 so Ocean Services got a number with some 22 suggestions of what to do. There's been back

| Page 51<br>and forth with NOAA budget. And we believe<br>we're kind of pretty close to what we think is<br>okay, our budget. But that's not the end of<br>the line.<br>Now we have to take it back, once<br>we've gotten to this point to Commerce, OMB<br>and the Hill.<br>So, I would love to say that it<br>was an internal thing because we would be<br>done. And I think we've pretty much done a<br>back and forth. But, we're going to have to<br>send it back around for final approval.<br>And as you may know, you would<br>know, there's certainly still some<br>complications with the fact that there are no<br>earmarks, but there are, but there aren't.<br>And so we're still around the edges trying to<br>wrangle with, okay, you gave us a number, does<br>that truly mean we don't have earmarks. Well,<br>no. Yes. No. Yes. It means you have no<br>earmarks, but here's the things that Senator<br>So-and-So wants to make sure that you really, |    |  |
|--|----|--|
| we're kind of pretty close to what we think is<br>okay, our budget. But that's not the end of<br>the line. Now we have to take it back, once<br>we've gotten to this point to Commerce, OMB<br>and the Hill. So, I would love to say that it was an internal thing because we would be<br>done. And I think we've pretty much done a<br>back and forth. But, we're going to have to<br>send it back around for final approval. And as you may know, you would<br>know, there's certainly still some<br>complications with the fact that there are no<br>earmarks, but there are, but there aren't. And so we're still around the edges trying to<br>wrangle with, okay, you gave us a number, does<br>that truly mean we don't have earmarks. Well,<br>no. Yes. No. Yes. It means you have no<br>earmarks, but here's the things that Senator  |    | Page 55  |
| <ul> <li>okay, our budget. But that's not the end of</li> <li>the line.</li> <li>Now we have to take it back, once</li> <li>we've gotten to this point to Commerce, OMB</li> <li>and the Hill.</li> <li>So, I would love to say that it</li> <li>was an internal thing because we would be</li> <li>done. And I think we've pretty much done a</li> <li>back and forth. But, we're going to have to</li> <li>send it back around for final approval.</li> <li>And as you may know, you would</li> <li>know, there's certainly still some</li> <li>complications with the fact that there are no</li> <li>earmarks, but there are, but there aren't.</li> <li>And so we're still around the edges trying to</li> <li>wrangle with, okay, you gave us a number, does</li> <li>that truly mean we don't have earmarks. Well,</li> <li>no. Yes. No. Yes. It means you have no</li> <li>earmarks, but here's the things that Senator</li> </ul>                             | 1  | and forth with NOAA budget. And we believe     |
| <ul> <li>the line.</li> <li>Now we have to take it back, once</li> <li>we've gotten to this point to Commerce, OMB</li> <li>and the Hill.</li> <li>So, I would love to say that it</li> <li>was an internal thing because we would be</li> <li>done. And I think we've pretty much done a</li> <li>back and forth. But, we're going to have to</li> <li>send it back around for final approval.</li> <li>And as you may know, you would</li> <li>know, there's certainly still some</li> <li>complications with the fact that there are no</li> <li>earmarks, but there are, but there aren't.</li> <li>And so we're still around the edges trying to</li> <li>wrangle with, okay, you gave us a number, does</li> <li>that truly mean we don't have earmarks. Well,</li> <li>no. Yes. No. Yes. It means you have no</li> <li>earmarks, but here's the things that Senator</li> </ul>  | 2  | we're kind of pretty close to what we think is |
| 5Now we have to take it back, once6we've gotten to this point to Commerce, OMB7and the Hill.8So, I would love to say that it9was an internal thing because we would be10done. And I think we've pretty much done a11back and forth. But, we're going to have to12send it back around for final approval.13And as you may know, you would14know, there's certainly still some15complications with the fact that there are no16earmarks, but there are, but there aren't.17And so we're still around the edges trying to18wrangle with, okay, you gave us a number, does19that truly mean we don't have earmarks. Well,20no. Yes. No. Yes. It means you have no21earmarks, but here's the things that Senator  | 3  | okay, our budget. But that's not the end of    |
| 6 we've gotten to this point to Commerce, OMB<br>and the Hill. 8 So, I would love to say that it 9 was an internal thing because we would be 10 done. And I think we've pretty much done a 11 back and forth. But, we're going to have to 12 send it back around for final approval. 13 And as you may know, you would 14 know, there's certainly still some 15 complications with the fact that there are no 16 earmarks, but there are, but there aren't. 17 And so we're still around the edges trying to 18 wrangle with, okay, you gave us a number, does 19 that truly mean we don't have earmarks. Well, 10 No. Yes. No. Yes. It means you have no 21 earmarks, but here's the things that Senator  | 4  | the line.                                      |
| 7and the Hill.8So, I would love to say that it9was an internal thing because we would be10done. And I think we've pretty much done a11back and forth. But, we're going to have to12send it back around for final approval.13And as you may know, you would14know, there's certainly still some15complications with the fact that there are no16earmarks, but there are, but there aren't.17And so we're still around the edges trying to18wrangle with, okay, you gave us a number, does19that truly mean we don't have earmarks. Well,20no. Yes. No. Yes. It means you have no21earmarks, but here's the things that Senator  | 5  | Now we have to take it back, once              |
| 8So, I would love to say that it9was an internal thing because we would be10done. And I think we've pretty much done a11back and forth. But, we're going to have to12send it back around for final approval.13And as you may know, you would14know, there's certainly still some15complications with the fact that there are no16earmarks, but there are, but there aren't.17And so we're still around the edges trying to18wrangle with, okay, you gave us a number, does19that truly mean we don't have earmarks. Well,20no. Yes. No. Yes. It means you have no21earmarks, but here's the things that Senator  | б  | we've gotten to this point to Commerce, OMB    |
| 9 was an internal thing because we would be<br>done. And I think we've pretty much done a<br>back and forth. But, we're going to have to<br>send it back around for final approval.<br>13 And as you may know, you would<br>14 know, there's certainly still some<br>complications with the fact that there are no<br>earmarks, but there are, but there aren't.<br>17 And so we're still around the edges trying to<br>18 wrangle with, okay, you gave us a number, does<br>19 that truly mean we don't have earmarks. Well,<br>10. Yes. No. Yes. It means you have no<br>earmarks, but here's the things that Senator  | 7  | and the Hill.                                  |
| 10done. And I think we've pretty much done a11back and forth. But, we're going to have to12send it back around for final approval.13And as you may know, you would14know, there's certainly still some15complications with the fact that there are no16earmarks, but there are, but there aren't.17And so we're still around the edges trying to18wrangle with, okay, you gave us a number, does19that truly mean we don't have earmarks. Well,20no. Yes. No. Yes. It means you have no21earmarks, but here's the things that Senator  | 8  | So, I would love to say that it                |
| <ul> <li>back and forth. But, we're going to have to</li> <li>send it back around for final approval.</li> <li>And as you may know, you would</li> <li>know, there's certainly still some</li> <li>complications with the fact that there are no</li> <li>earmarks, but there are, but there aren't.</li> <li>And so we're still around the edges trying to</li> <li>wrangle with, okay, you gave us a number, does</li> <li>that truly mean we don't have earmarks. Well,</li> <li>no. Yes. No. Yes. It means you have no</li> <li>earmarks, but here's the things that Senator</li> </ul>  | 9  | was an internal thing because we would be      |
| 12 send it back around for final approval. 13 And as you may know, you would 14 know, there's certainly still some 15 complications with the fact that there are no 16 earmarks, but there are, but there aren't. 17 And so we're still around the edges trying to 18 wrangle with, okay, you gave us a number, does 19 that truly mean we don't have earmarks. Well, 20 no. Yes. No. Yes. It means you have no 21 earmarks, but here's the things that Senator  | 10 | done. And I think we've pretty much done a     |
| And as you may know, you would<br>know, there's certainly still some<br>complications with the fact that there are no<br>earmarks, but there are, but there aren't.<br>And so we're still around the edges trying to<br>wrangle with, okay, you gave us a number, does<br>that truly mean we don't have earmarks. Well,<br>no. Yes. No. Yes. It means you have no<br>earmarks, but here's the things that Senator  | 11 | back and forth. But, we're going to have to    |
| 14 know, there's certainly still some<br>15 complications with the fact that there are no<br>16 earmarks, but there are, but there aren't.<br>17 And so we're still around the edges trying to<br>18 wrangle with, okay, you gave us a number, does<br>19 that truly mean we don't have earmarks. Well,<br>20 no. Yes. No. Yes. It means you have no<br>21 earmarks, but here's the things that Senator  | 12 | send it back around for final approval.        |
| 15 complications with the fact that there are no 16 earmarks, but there are, but there aren't. 17 And so we're still around the edges trying to 18 wrangle with, okay, you gave us a number, does 19 that truly mean we don't have earmarks. Well, 20 no. Yes. No. Yes. It means you have no 21 earmarks, but here's the things that Senator   | 13 | And as you may know, you would                 |
| <pre>16 earmarks, but there are, but there aren't. 17 And so we're still around the edges trying to 18 wrangle with, okay, you gave us a number, does 19 that truly mean we don't have earmarks. Well, 20 no. Yes. No. Yes. It means you have no 21 earmarks, but here's the things that Senator</pre>   | 14 | know, there's certainly still some             |
| And so we're still around the edges trying to<br>wrangle with, okay, you gave us a number, does<br>that truly mean we don't have earmarks. Well,<br>no. Yes. No. Yes. It means you have no<br>earmarks, but here's the things that Senator   | 15 | complications with the fact that there are no  |
| 18 wrangle with, okay, you gave us a number, does<br>19 that truly mean we don't have earmarks. Well,<br>20 no. Yes. No. Yes. It means you have no<br>21 earmarks, but here's the things that Senator  | 16 | earmarks, but there are, but there aren't.     |
| 19 that truly mean we don't have earmarks. Well,<br>20 no. Yes. No. Yes. It means you have no<br>21 earmarks, but here's the things that Senator   | 17 | And so we're still around the edges trying to  |
| 20 no. Yes. No. Yes. It means you have no<br>21 earmarks, but here's the things that Senator   | 18 | wrangle with, okay, you gave us a number, does |
| 21 earmarks, but here's the things that Senator  | 19 | that truly mean we don't have earmarks. Well,  |
|  | 20 | no. Yes. No. Yes. It means you have no         |
| 22 So-and-So wants to make sure that you really,   | 21 | earmarks, but here's the things that Senator   |
|  | 22 | So-and-So wants to make sure that you really,  |

|    | Page 56  |
|----|--|
| 1  | really consider. Okay, but those aren't part   |
| 2  | of my budget. I know, but.                     |
| 3  | So part of the uncertainty still               |
| 4  | is how much of what isn't an earmark and won't |
| 5  | be, will be.                                   |
| 6  | CHAIR WELCH: Okay. Thanks.                     |
| 7  | Joyce.   |
| 8  | MEMBER MILLER: Yes. How does that              |
| 9  | affect   |
| 10 | CHAIR WELCH: And, Joyce, at least              |
| 11 | for a while let's introduce ourselves every    |
| 12 | time we speak. Because we don't all know each  |
| 13 | other yet.                                     |
| 14 | MEMBER MILLER: Yes. Okay. Joyce                |
| 15 | Miller again.                                  |
| 16 | How does that affect Nav Services              |
| 17 | in particular this whole budget uncertainty?   |
| 18 | You know, what does it do to their planning    |
| 19 | ability; their use of ships? You know, how     |
| 20 | does that roll down?                           |
| 21 | MR. KENNEDY: It affects them like              |
| 22 | it affects everyone. But that's a leading      |
|    |  |

|    | Page 57  |
|----|--|
| 1  | question.                                      |
| 2  | MEMBER MILLER: Yes.                            |
| 3  | MR. KENNEDY: Because it                        |
| 4  | dramatically affects their ability to look     |
| 5  | out. And so for months Coast Survey, the Nav   |
| 6  | Services in general, have had to ride the      |
| 7  | roller coaster with us about okay, here's the  |
| 8  | latest scenario You're not now cut \$50        |
| 9  | million, you're cut \$200 million and how do   |
| 10 | you get by. And so there has been no stability |
| 11 | in being able to kind of look out and know     |
| 12 | that you can fund the following things and     |
| 13 | move out.                                      |
| 14 | Complicating that even further,                |
| 15 | and I don't know. Captain Lowell, what do we   |
| 16 | say about the ships? Is this anything you're   |
| 17 | going to talk about, the ship time and vessels |
| 18 | and that whole deal?                           |
| 19 | CAPT. LOWELL: I'm not going into               |
| 20 | detail on that. But obviously the budgetary    |
| 21 | uncertainty has affected not only the ships    |
| 22 | and the sea days and the staffing of those     |

Page 58 assets, but also our contract pot. 1 Basically 2 is we haven't been able to spend any kind of money, and it's been an impact directly for 3 like work in Alaska. If we don't get it out 4 5 the door right now, it will seriously reduce our ability to collect data. 6 7 So we're struggling with that 8 right now. We're spending on the numbers that 9 we think we're going to get minus some safety 10 factors. But we're starting to move on it 11 right now. It's been very much a challenge. 12 MR. KENNEDY: Yes. It's just extremely difficult. I just don't think the 13 14 general public has any idea of how crippling this kind of a debate is to due process in the 15 16 government. It's been pretty tough. 17 Yes, sir. 18 MEMBER JAY: David Jay. 19 I was curious. I don't understand 20 the budget process all that well. You had 21 this big budget compromise. 22 MR. KENNEDY: Yes.

Page 59 MEMBER JAY: So you got a budget 1 2 number, but what kind of approval do you have -- you said "all the way back to the Hill." 3 Is this because of the oversight role of 4 5 congressional committees or what is that? MR. KENNEDY: They're interested 6 7 to make sure that with the lump number that we 8 got, that then it's broken down and we're 9 coming back with investments in specific 10 All different parts of Congress have areas. interests in all different parts of what we 11 12 invest in. And so they didn't tell us exactly what to invest in, so now they want to look at 13 14 that. And they want to say "Okay, we gave you a big number and you figured it all out down 15 to the individual lines as to what you're 16 going to invest, and then we want to look at 17 18 that and see if we think you did right." 19 MEMBER JAY: So that's not the 20 House Budget Committee, that's an oversight 21 committee? 22 Yes, right. So MR. KENNEDY:

|    | Page 60                                       |
|----|---|
| 1  | that's and again, we've got go through        |
| 2  | Department of Commerce and OMB both before we |
| 3  | get there.                                    |
| 4  | So, and given the Congress we                 |
| 5  | have, particularly in the House, some of the  |
| 6  | things that we are investing in, they may not |
| 7  | be happy with. So it's not out of the         |
| 8  | question that even some of those things that  |
| 9  | we have currently said we're going to spend   |
| 10 | money, we may now still hear "No, we don't    |
| 11 | want you to."                                 |
| 12 | Yes? I'm sorry. I'm taking your               |
| 13 | role away, and I won't do it anymore.         |
| 14 | CHAIR WELCH: That's all right.                |
| 15 | That's all right.                             |
| 16 | MEMBER JACOBSEN: Tom Jacobsen,                |
| 17 | Long Beach Pilots.                            |
| 18 | You touched on the Harbor                     |
| 19 | Maintenance Trust.                            |
| 20 | MR. KENNEDY: Yes.                             |
| 21 | MEMBER JACOBSEN: And you looked               |
| 22 | into using that. Is that just you're not      |

|    | Page 61  |
|----|--|
| 1  | going to try that again or is there a chance   |
| 2  | we could use that for some things like the     |
| 3  | port system?                                   |
| 4  | MR. KENNEDY: I think I've                      |
| 5  | probably been involved in trying to get at the |
| 6  | Harbor Maintenance Trust Fund for 25 years of  |
| 7  | my career. So the answer is we are continuing  |
| 8  | to discuss and it does occasionally get on the |
| 9  | table let's try this again, or have we thought |
| 10 | about this. So we're trying to get access to   |
| 11 | it. But it's an offset for the budget, and     |
| 12 | that's a tough road to hoe to get anybody to   |
| 13 | want to actually let us use it.                |
| 14 | MEMBER JACOBSEN: Yes.                          |
| 15 | MR. KENNEDY: And then there's a                |
| 16 | lot of concern about who all would want to use |
| 17 | it if they did open door.                      |
| 18 | MEMBER JACOBSEN: I know the Port               |
| 19 | of Long Beach looked into it to use some of    |
| 20 | that money for the port system locally.        |
| 21 | MR. KENNEDY: Right.                            |
| 22 | MEMBER JACOBSEN: And if other                  |
|    |  |

|    | Page 62  |
|----|--|
| 1  | ports would jump in, maybe that would help     |
| 2  | with having port authorities, you know the     |
| 3  | West Coast, Gulf Coast, help out. Would that   |
| 4  | work?  |
| 5  | MR. KENNEDY: Well, I think any                 |
| 6  | advocacy for getting access to the funds,      |
| 7  | especially as it relates to stuff that there's |
| 8  | been a big debate about. You know, who should  |
| 9  | fund it and in many cases the argument is well |
| 10 | the government ought to fund it and the        |
| 11 | government is trying to get the private sector |
| 12 | involved, or at least the local folks.         |
| 13 | And so anything that we can do to              |
| 14 | offset and get some things moving along that   |
| 15 | line with that fund, we'd love to work with or |
| 16 | have an advocacy, I think.                     |
| 17 | Is there any kind of official                  |
| 18 | where we are with the Trust Fund right now,    |
| 19 | Paul, or anyone?                               |
| 20 | MR. BRADLEY: Yes. I'd actually                 |
| 21 | like to weigh in that.                         |
| 22 | I'm Paul Bradley, I work in the                |

Management and Budget Office at the National
 Ocean Service.

And there's an interesting 3 4 development on Harbor Maintenance Trust Fund 5 right now because OMB is apparently interested 6 in opening that pot up to fund some of NOAA's 7 base programs. And not to expand basically 8 with the moving of the boxes, rather then 9 expanding the box. So some of NOAA's programs 10 that this supports directly, not supports the program but individual port's, it's supporting 11 12 directly, you know they're considering whether it would be advantageous to fund some of those 13 14 programs. The base, you know based on not new money from the Harbor Maintenance Trust Fund. 15 16 I think there's going to be a lot of discussion about that from the industry 17 18 folks, you know the people paying the tax. 19 Because, obviously, dredging is the number one 20 concern there and they want more flex to be 21 able to maintain dredge depths. And so it's 22 something that the folks are looking at, and

|    | Page 64  |
|----|--|
| 1  | I think certainly we're into following it      |
| 2  | closely.                                       |
| 3  | I think your point about trying to             |
| 4  | show that NOAA's PORTS Program, for example,   |
| 5  | how that supports ports and maybe looking at   |
| б  | that as a use for Harbor Maintenance Trust     |
| 7  | Fund, but getting support from industry would  |
| 8  | be helpful.                                    |
| 9  | MEMBER JACOBSEN: Well, exactly.                |
| 10 | And I think, you know if the ports and the     |
| 11 | pilots can show that, you know using the right |
| 12 | equipment, the port's equipment and the air    |
| 13 | gap sensors, you know we can bring bigger      |
| 14 | ships in without dredging. I mean we still     |
| 15 | need the dredging, but we can do it more       |
| 16 | efficiently. So I mean, there's ways of        |
| 17 | showing this, and I'd just like to get people  |
| 18 | together and keep pushing for it, tapping into |
| 19 | that source.                                   |
| 20 | CHAIR WELCH: Let me make a                     |
| 21 | comment. This is Ed Welch.                     |
| 22 | The Harbor Maintenance Trust Fund,             |
|    |  |

|    | Page 65  |
|----|--|
| 1  | perhaps not everybody is fully familiar with   |
| 2  | it. It is a statutory program created by law   |
| 3  | by Congress. There is what amounts to a tax,   |
| 4  | ad valorem tax on the value of cargo imports   |
| 5  | and also passengers on vessels that come into  |
| 6  | the United States. And it's been in existence  |
| 7  | for about 25 years now, maybe 30 years.        |
| 8  | And money that is collected goes               |
| 9  | into this "trust fund." And it is              |
| 10 | appropriated, supposedly, each year by         |
| 11 | Congress for certain types of dredging         |
| 12 | activities and maintenance activities of ports |
| 13 | around the country.                            |
| 14 | The problem is Congress and                    |
| 15 | several Administrations have not they've       |
| 16 | been collecting more money then they've been   |
| 17 | appropriating. So at the same time as          |
| 18 | dredging needs are not being taken care of in  |
| 19 | the view of lots users around the country, and |
| 20 | the harbors and the channels are silting up,   |
| 21 | this money which has been collected for the    |
| 22 | ostensible purpose of dredging the harbors is  |

|    | Page 66  |
|----|--|
| 1  | piling up in the Trust Fund.                   |
| 2  | So you can imagine that hacks off              |
| 3  | all the people that are paying the taxes and   |
| 4  | all the people that run port authorities, and  |
| 5  | all the people that do dredging contracts. And |
| 6  | so they are continually saying "We've got a    |
| 7  | dredging crises. We have a port crises. We're  |
| 8  | collecting money for this purpose and we       |
| 9  | aren't spending it. Let's spend the money and  |
| 10 | get our physical facilities and ports back in  |
| 11 | shape."  |
| 12 | So that's the basic political                  |
| 13 | fight.   |
| 14 | MR. KENNEDY: Yes.                              |
| 15 | CHAIR WELCH: But adding to that                |
| 16 | is that anytime in Washington when a pile of   |
| 17 | money starts accumulating, it starts looking   |
| 18 | attractive. Because they say,"Hey, we need     |
| 19 | money for." The know-all nautical services or  |
| 20 | various types of trade promotion policy.       |
| 21 | So there's a community of people               |
| 22 | that are saying (a), we want to defend what we |

Page 67 1 got and we want to spend it for the original 2 purposes. And (b), then there's a bigger community of other folks who are somewhat 3 related to the original purpose, but not 4 5 exactly, who are saying "We could use some of 6 that money." And this secondary group is 7 resisted by the first group. They're saying 8 "Hands off our money. We got enough problems 9 just trying to get it spent for the original 10 purpose." 11 And so you got the money 12 accumulating. You got people fighting as to should it be spent for the original purposes 13 14 or should the purposes be expanded. And any kind of a change is going to require 15 legislation of Congress. This is not 16 17 something the Administration can get together 18 and decide as a part of their budget proposal 19 they're going to start spending the money for 20 some other purpose. 21 So that's what this Harbor 22 Maintenance Trust Fund debate is all about.

Page 68 And similar trust funds exist in 1 2 other things. For example, there's an Oil Spill Pollution Trust Fund which collects 3 4 money that is supposed to pay for our 5 prevention and response to oil spills. And, 6 obviously, has been used quite a bit in the 7 last year. 8 You know, one of the things some 9 folks, including me, say is "You know, to the 10 extent that proper nautical systems or navigation systems or the ports system that's 11 12 run by NOAA prevent ships from spilling oil in the first place, that's a very efficient use 13 14 of money from the Oil Spill Trust Fund. You're preventing spill in the first place 15 rather than wasting a lot of money trying to 16 skim up the spill afterwards." 17 18 So this type of debate on the 19 Harbor Maintenance Trust Fund is replicated in 20 other parts of the Federal Government. 21 Gary? 22 MEMBER JEFFRESS: Gary Jeffress,

|    | Page 69  |
|----|--|
| 1  | Texas A&M University, Corpus Christi.          |
| 2  | With this aspect of funding                    |
| 3  | through the Harbor Maintenance Trust Fund, I'm |
| 4  | assuming that the Corps of Engineers gets the  |
| 5  | majority of that for dredging purposes, is     |
| б  | that correct?                                  |
| 7  | CHAIR WELCH: I think that's                    |
| 8  | correct, although it's ultimately the people   |
| 9  | that do most of the work are private           |
| 10 | contractors.                                   |
| 11 | MEMBER JEFFRESS: Okay. So this                 |
| 12 | is how ports fits into this. In Texas right    |
| 13 | now we're rebuilding two tide gauges which are |
| 14 | part of the port systems. One for the Sabine   |
| 15 | Pass and one for the Houston-Galveston port    |
| 16 | system. These are the large sentinel           |
| 17 | structures. And the Corps of Engineers is      |
| 18 | funding that and the money is coming from Ike  |
| 19 | damage reconstruction. But they will be        |
| 20 | integrated back into the they're replacing     |
| 21 | TCOON, Texas Coastal Ocean Observation Network |
| 22 | tide gauges which were destroyed by Ike.       |

|    | Page 70  |
|----|--|
| 1  | And part of the instrumentation                |
| 2  | that they're putting back onto these super     |
| 3  | tide gauges is precise GPS positioning. We're  |
| 4  | putting CORS stations on these tide gauges.    |
| 5  | Now the Corps has requested these              |
| 6  | because they want to start using machine       |
| 7  | controls for dredging them. You know what      |
| 8  | machine control is, you use precise GPS        |
| 9  | positioning now to control machines like road  |
| 10 | construction, graders or farming equipment.    |
| 11 | They want to start using it for dredging which |
| 12 | will integrate real-time water level           |
| 13 | oscillations with precise positioning to get   |
| 14 | a three dimensional dredging operation fairly  |
| 15 | accurate, which is actually going to make      |
| 16 | dredging a lot more efficient.                 |
| 17 | CHAIR WELCH: So it becomes part                |
| 18 | of the infrastructure for a dredging project?  |
| 19 | MEMBER JEFFRESS: Exactly. And so               |
| 20 | the Corps is looking at this as a way to, you  |
| 21 | know make their dredging numbers lower and     |
| 22 | theoretically it can save millions and         |

Page 71 millions of dollars. But at the same time 1 2 this is going to be integrated into the port system so then you can also use it at 3 Galveston. So it would be worth a lot to make 4 5 that efficiency argument to incorporate for 6 the funding of ports for that sort of 7 technology for future funding of the Harbor 8 Maintenance Trust Fund. 9 CHAIR WELCH: I think so that we 10 can stay on schedule, we need to sort of wrap up this session with David. So I think what 11 12 I'll do is, again, thank David for his 13 presentation and his presence. 14 How long are you going to be able to be here? 15 16 MR. KENNEDY: Oh, I'm here off and 17 on for the next two days. 18 CHAIR WELCH: Okay. Oh, good. 19 MR. KENNEDY: So I got a couple of 20 things I got to do on the side, but I'm in and 21 out. 22 CHAIR WELCH: Particularly you new

|    | Page 72  |
|----|--|
| 1  | members who don't really know David, I hope    |
| 2  | you'll have a chance to individually spend     |
| 3  | some time with him, and talk to him a little   |
| 4  | bit about your situation and your interests.   |
| 5  | And one more thing before we move              |
| б  | on, we skipped this before. We need to take    |
| 7  | a moment and go around and have each Panel     |
| 8  | member introduce himself or herself, what your |
| 9  | affiliation, where you location is and a       |
| 10 | little bit just a very little bit of           |
| 11 | background as to what brought you to this      |
| 12 | profession and this Panel. Also whether        |
| 13 | you're a new member or a returning member.     |
| 14 | So if we could, let's start                    |
| 15 | Captain Jacobsen.                              |
| 16 | MEMBER JACOBSEN: Tom Jacobsen,                 |
| 17 | Long Beach Pilots.                             |
| 18 | We use in Long Beach, we use a lot             |
| 19 | of technology to bring the ships in and out of |
| 20 | the port, high precision GPS equipment and     |
| 21 | also the PORTS system. But we move about       |
| 22 | 7,000 ships per year, so that's what kind of   |
|    | Page 73  |
|----|--|
| 1  | got me into this group.                        |
| 2  | CHAIR WELCH: And you've been on                |
| 3  | the Panel three years                          |
| 4  | MEMBER JACOBSEN: Same as you?                  |
| 5  | CHAIR WELCH: Yes.                              |
| 6  | MEMBER JACOBSEN: Yes.                          |
| 7  | MEMBER HICKMAN: Sherri Hickman,                |
| 8  | pilot in Houston. Been a pilot 17 years and    |
| 9  | like, Tom, that's what got me on this Panel.   |
| 10 | We use a lot of the PORTS                      |
| 11 | programs. I have my navigation computer right  |
| 12 | here if anyone wants to see how I can pull all |
| 13 | that stuff up. I don't have my antenna, so I   |
| 14 | can't show you us moving on it, but I can show |
| 15 | you the PORTS programs that I do have on       |
| 16 | there.   |
| 17 | And I was advised today that I'm               |
| 18 | like the oldest member, not age-wise but       |
| 19 | tenure-wise on this Panel.                     |
| 20 | MEMBER CAROTHERS: My name is Jeff              |
| 21 | Carothers. I'm the I used to say marine        |
| 22 | surveyors, but in this group I can't say       |

|    | Page 74                                       |
|----|---|
| 1  | marine surveyors; those are the people that   |
| 2  | look at ships and decide whether they're      |
| 3  | seaworthy or not. So I'm going to say I'm a   |
| 4  | hydrographic and geophysical survey manager   |
| 5  | for Fugro Consultants in the United States.   |
| 6  | Started out in this business about            |
| 7  | 1979 and done nothing else since.             |
| 8  | Located close to Long Beach in                |
| 9  | Ventura, California.                          |
| 10 | And this is my first year on the              |
| 11 | Panel.  |
| 12 | MEMBER JAY: I'm David Jay. I'm a              |
| 13 | Professor at Portland State University. And   |
| 14 | I have a whole lot of interest in tides, long |
| 15 | term changes in tides and sea level. I work   |
| 16 | closely with the Port of Portland related to  |
| 17 | navigational safety issues, long term changes |
| 18 | in how much water we have under ships coming  |
| 19 | into the harbor, which is a big issue, a big  |
| 20 | concern for them. Salmon restoration, salmon  |
| 21 | habitat; a whole lot of things.               |
| 22 | And by the way, the Port of                   |

|    | Page 75  |
|----|--|
| 1  | Portland is keenly interested in salmon        |
| 2  | restoration, too, because it's connected to    |
| 3  | their dredging. So these issues aren't as      |
| 4  | separate as they used to be and everybody's    |
| 5  | trying to pull together, at least in the       |
| 6  | Columbia River.                                |
| 7  | CHAIR WELCH: And our Panel had a               |
| 8  | recent meeting right across the river from     |
| 9  | Portland in Vancouver, Washington.             |
| 10 | Lawson?  |
| 11 | MEMBER BRIGHAM: Good morning,                  |
| 12 | everyone. I am Lawson Brigham from the         |
| 13 | University of Alaska, Fairbanks. And I teach   |
| 14 | geography and work on Arctic policy and am     |
| 15 | fairly involved with the Arctic Council, Chair |
| 16 | of the Arctic Marine Shipping Assessment,      |
| 17 | which I'll talk a little bit about tomorrow.   |
| 18 | As a matter of disclosure, I was a             |
| 19 | Coast Guard officer for three decades, and I   |
| 20 | was on the maritime side, like the Captain in  |
| 21 | command of a bunch of ships, including a polar |
| 22 | icebreaker at both ends of the world. So my    |

Page 76 1 interests are polar, but all maritime 2 interests of the Committee. Somewhat involved distantly in 3 4 pushing elements of the National Ocean Policy 5 work, behind the scenes I would say. MEMBER PERKINS: Good morning. 6 7 Scott Perkins with Wilson & Company, engineers and architects. 8 9 I'm a surveyor by practice 10 experienced with doing ports and harbors on the Great Lakes, shallow water habitat on the 11 12 Missouri, Mississippi, Illinois waterway, a variety of navigational chart services and 13 14 hydro chart services for the Corps of Engineers. And then participate under 15 16 shoreline mapping contract, you know, for NGS. 17 So it's a pleasure to be here and 18 an honor to serve. 19 MEMBER MILLER: I'm Joyce Miller. 20 I'm with the Joint Institute for Marine and 21 Atmospheric Research here in Honolulu, that's 22 part of the Research Corporation of the

|    | Page 77  |
|----|--|
| 1  | University of Hawaii.                          |
| 2  | I work very closely with the NOAA              |
| 3  | Coral's program. I've been out here for about  |
| 4  | a decade.                                      |
| 5  | I've been doing multi-beam                     |
| 6  | surveying since the first NOAA vessel the      |
| 7  | surveyor had the multi-beam on it. And I am    |
| 8  | a commercial certified hydrographer and have   |
| 9  | worked commercially as well.                   |
| 10 | We've been mapping out here in                 |
| 11 | Hawaii under a lot of different funding, but   |
| 12 | one of the NOS programs, Coral funding jointly |
| 13 | with the University of Hawaii.                 |
| 14 | And I'm very interested in this                |
| 15 | meeting being out here. It's great to have     |
| 16 | the Panel finally come out after it's what?    |
| 17 | Eight year existence. And I'm pleased to be    |
| 18 | on the Panel.                                  |
| 19 | Thank you.                                     |
| 20 | MEMBER SHINGLEDECKER: I'm Susan                |
| 21 | Shingledecker. I work for BoatUS, the Boat     |
| 22 | Owners Association of the United States. So    |

|    | Page 78  |
|----|--|
| 1  | relative to most of you, I look out for the    |
| 2  | little guys.                                   |
| 3  | We have over half a million                    |
| 4  | members who are the nation's recreational      |
| 5  | boaters. We're also a boat insurance company,  |
| 6  | so things like sea level rise and storm        |
| 7  | predictions and those kind of things,          |
| 8  | navigation, running ground those all impact us |
| 9  | as well directly as a private business.        |
| 10 | I work for the nonprofit part of               |
| 11 | BoatUS, the BoatUS Foundation for Boating      |
| 12 | Safety and Clean Water. Obviously              |
| 13 | navigational safety has a big impact on        |
| 14 | recreational boats. I run all of our           |
| 15 | environmental programs, so anyway that a       |
| 16 | recreational boat can impact the environment   |
| 17 | falls under my jurisdiction.                   |
| 18 | Happy to be here.                              |
| 19 | VICE CHAIR WELLSLAGER: Good                    |
| 20 | morning. My name is Matt Wellslager. I am an   |
| 21 | employed or second term officer with the HSRP. |
| 22 | I am the Vice Chair.                           |

Page 79 1 I am a surveyor by training. Ι 2 got into hydrographic surveys in my first professional career as a NOAA Corps officer, 3 and then moved to the South Carolina Geodetic 4 5 Survey where I have been working with geodesy, spatial planning and mapping. 6 7 I administer a real-time network 8 of 52 GPS and GLONASS receivers and find the interesting comments that Dr. Jeffress about 9 real-time tides and dredging using real-time 10 networks very thought provoking. 11 Because 12 these are going to be things that we as a group will look at needing to address in the 13 These networks are growing and it's 14 future. a service that can be done and used to 15 facilitate projects guite well, and the 16 savings are great robust as well. 17 18 But thank you. 19 CHAIR WELCH: I'm Ed Welch. 20 Originally from North Carolina. Been in 21 Washington, D.C. area for 30-something years. 22 I'm currently in the private

|    | Page 80  |
|----|--|
| 1  | sector representing and providing advocacy for |
| 2  | various types of commercial maritime users     |
| 3  | including the U.S. Passenger Vessel            |
| 4  | Association. I represent some foreign          |
| 5  | shipping cargo companies as well.              |
| 6  | For 20 years I was on the staff of             |
| 7  | the House of Representatives and was the chief |
| 8  | counsel of the House Committee that had        |
| 9  | oversight for most of the NOAA marine programs |
| 10 | as well as shipping and Coast Guard.           |
| 11 | I'm in my third year on the Panel.             |
| 12 | CAPT. LOWELL: Yes. I'm Captain                 |
| 13 | John Lowell, I'm the Director of the Office of |
| 14 | Coast Survey and also what is referred to as   |
| 15 | the DFO or Designated Federal Official of this |
| 16 | Panel.   |
| 17 | Thank you.                                     |
| 18 | MS. BLACKWELL: I'm Juliana                     |
| 19 | Blackwell, the Director of the National        |
| 20 | Geodetic Survey. And I've been with NOAA for   |
| 21 | 21 years. The first third of my career was in  |
| 22 | the NOAA Corps and gained a great deal of      |

|    | Page 8   |
|----|--|
| 1  | operational experience with hydrographic and   |
| 2  | geodetic surveying.                            |
| 3  | MR. EDWING: Good morning. I'm                  |
| 4  | Richard Edwing, the Director of the Center for |
| 5  | Operational Oceanographic Products and         |
| 6  | Services. This is my 35th year of service to   |
| 7  | NOAA.  |
| 8  | The first 20 years I started with              |
| 9  | CO-OPS and worked for CO-OPS for 20 years.     |
| 10 | And then I accepted a detail up to the NOS     |
| 11 | Headquarters to help out with budgeting and    |
| 12 | strategic planning, and legislative affairs    |
| 13 | and those sorts of things. And ended up        |
| 14 | staying a bit too long because I was           |
| 15 | eventually made a division chief up there      |
| 16 | doing those same sorts of things.              |
| 17 | Came back to CO-OPS in 2002 as a               |
| 18 | Deputy Director. And about a year and a half   |
| 19 | ago became Director when Mike Szabados         |
| 20 | retired.                                       |
| 21 | MS. WATSON: Kathy Watson, HSRP                 |
| 22 | Program Coordinator.                           |
|    |  |

1

|    | Page 82  |
|----|--|
| 1  | MEMBER JEFFRESS: Gary Jeffress,                |
| 2  | Professor of Geographic Information Science    |
| 3  | and Director of the Conrad Blucher Institute   |
| 4  | for Surveying and Science at Texas A&M         |
| 5  | University at Corpus Christi.                  |
| 6  | My background is as a land                     |
| 7  | surveyor. First trained in Australia, and      |
| 8  | then to the University of Maine where I got    |
| 9  | Ph.D. in survey engineering.                   |
| 10 | At the Blucher Institute we house              |
| 11 | two programs that are associated with HSRP.    |
| 12 | That's the Texas Coastal Ocean Observation     |
| 13 | Network, it's a network of over 30 tide        |
| 14 | gauges, including the National Ocean Service   |
| 15 | gauges in Texas constructed to NOS standards.  |
| 16 | Primarily to determine the littoral boundary   |
| 17 | issues in Texas. That's the legal boundary     |
| 18 | between submerged lands owned by the state and |
| 19 | privately owned uplands. That data goes into   |
| 20 | courts so it has to be to national standards.  |
| 21 | We also run the blueprints to the              |
| 22 | Texas Spatial Reference Center which is sort   |

| 1  |  |
|----|--|
|    | Page 83  |
| 1  | of like a branch office of the National        |
| 2  | Geodetic Survey. We offer State of Texas       |
| 3  | Geodetic                                       |
| 4  | MEMBER DIONNE: I'm Michele                     |
| 5  | Dionne, and I'm a coastal ecologist with the   |
| 6  | Wells National Estuarine Research Reserve,     |
| 7  | which is one of 27 reserves around the country |
| 8  | that are state/federal partnerships within     |
| 9  | NOSOCRM. And I've been there for about 20      |
| 10 | years and have developed a program that        |
| 11 | represents many of the other uses that Nav     |
| 12 | Services and HSRP products are relevant to.    |
| 13 | We're very involved in trying to and not       |
| 14 | only at the Wells Reserve, but nationally      |
| 15 | trying to develop programs to understand       |
| 16 | coastal habitat change that are driven by      |
| 17 | changes in weather and climate, and so         |
| 18 | therefore vertical control is very important   |
| 19 | as well as mapping and other more              |
| 20 | sophisticated GIS/GPS sorts of technologies.   |
| 21 | We have been a leader within the               |
| 22 | Gulf of Maine in restoring tidal flow to what  |

|    | Page 84  |
|----|--|
| 1  | we call tidally restricted coastal habitats,   |
| 2  | especially salt marshes. So we're thinking of  |
| 3  | hydrology a lot that way.                      |
| 4  | And then you mentioned in Oregon,              |
| 5  | I believe, how they're trying to create        |
| 6  | habitat for salmon, intertidal habitat for     |
| 7  | salmon. So there's a nice interesting kind of  |
| 8  | marriage there between port expansion and      |
| 9  | maintenance and positive environmental things. |
| 10 | I am a fish ecologist, so I am                 |
| 11 | always thinking about ways to improve or       |
| 12 | restore coastal habitats to support more       |
| 13 | robust populations of fishes. As most people   |
| 14 | know, they are just a shadow of their former   |
| 15 | selves.  |
| 16 | I'm also involved with the                     |
| 17 | NERACOOS, the Northeast Regional Association   |
| 18 | of Coastal Ocean Observing Systems. Again,     |
| 19 | very much their vision of observing and        |
| 20 | collecting data has a lot of overlap with this |
| 21 | Panel.   |
| 22 | I'm also on the National Focus                 |

|    | Page 85                                       |
|----|---|
| 1  | Team for the Sea Grant Healthy Coastal        |
| 2  | Ecosystem Team. And so there's some overlap   |
| 3  | there as well.                                |
| 4  | And I guess that's enough for the             |
| 5  | moment.                                       |
| 6  | CAPT. GLANG: Good morning. I'm                |
| 7  | Captain Gerd Glang, NOAA Corps. I'm not on    |
| 8  | the Panel, but I am on Mr. Kennedy's staff as |
| 9  | a Strategic Planner. I've been involved in    |
| 10 | developing the coastal goal for the NOS. And  |
| 11 | that's the role I'll be playing today.        |
| 12 | Thank you.                                    |
| 13 | LT. RYAN: I'm Lieutenant Kyle                 |
| 14 | Ryan. I'm the Pacific Islands Navigation      |
| 15 | Manager. So I'm the pointman for Office of    |
| 16 | Coast Survey.                                 |
| 17 | MR. BRADLEY: Paul Bradley. I                  |
| 18 | work in the National Ocean Service Management |
| 19 | and Budget Office coordinating policy and     |
| 20 | legislative affairs as they relate to NOAA's  |
| 21 | three Navigation Services offices as well as  |
| 22 | the integrated Ocean Observing System.        |

|    | Page 86                                       |
|----|---|
| 1  | MS. DENTLER: I'm Virginia                     |
| 2  | Dentler. I work with CO-OPS.                  |
| 3  | CAPT. LOWELL: Well, for the                   |
| 4  | benefit of the new members, I just want to    |
| 5  | make a quick point. All of you, the 15 of you |
| 6  | as non-Feds are voting members of the Panel.  |
| 7  | The three of us who you see sitting up here,  |
| 8  | we are members of the Panel, but we're        |
| 9  | nonvoting members. So should there be any     |
| 10 | votes or anything we step aside when that     |
| 11 | occurs.                                       |
| 12 | There's also two other nonvoting              |
| 13 | members of the Panel, Andy Armstrong, who     |
| 14 | could not make this meeting he's at another   |
| 15 | conference. I think he's getting the program  |
| 16 | recertified, which of course we're interested |
| 17 | very much. And Dr. Larry Mayer who has only   |
| 18 | been peripherally involved with the Panel. He |
| 19 | actively wants to get back involved. And he   |
| 20 | had every intention of coming to this meeting |
| 21 | until, of course, he was pulled away on       |
| 22 | another topic. So there are two other         |

Page 87 nonvoting members of the Panel. 1 2 And we do have three members who 3 didn't make this meeting here: Mr. Stephen 4 Carothers from Maersk, Ramon Torres from San 5 Juan, Puerto Rico and --MS. WATSON: Steve Carmel. 6 7 CAPT. LOWELL: -- Steve Carmel. 8 Oh Steve was Maersk. MS. WATSON: Steve was Maersk. 9 CAPT. LOWELL: Bob Hanson. 10 And I should mention that if Bob mention was here he 11 12 would have waded in quickly and forcibly on the Harbor Maintenance Trust Fund discussion. 13 14 CHAIR WELCH: Okay. Thanks very 15 much. So that's who we are and we'll get to 16 know each other, and little more about each 17 other as we proceed. 18 We are trying something a little 19 bit new on the agenda from the past Panel 20 members. We're going to have three of our 21 actual voting panel members make presentations 22 later in the program, areas of their

Page 88 expertise. So we will look forward to those 1 2 presentations. 3 At this point, we're going to 4 recognize Captain Glang to lead some 5 discussion. One of the things that NOAA is 6 hoping for our Panel to do is to engage in 7 some strategic and long-term thinking. So you 8 will hear us discussing how we can do that 9 over the next several days. And we'll wrap it 10 up on the third day with some intense discussion along those lines. 11 12 But, Gerd, why don't you make your additional comments at this point. 13 14 And I will point out that a little bit, maybe 20 or 25 minutes from now, we'll 15 take a break in his presentation and then 16 finish up after the break. 17 18 CAPT. GLANG: Okay. Thank you, 19 Ed. 20 I am Gerd Glang. 21 I wanted to point to a few things. 22 One was Mr. Kennedy opened really well with

Page 89 1 his PowerPoint slide, and we may go back to 2 that. But there are a couple of slides in 3 there that are really good. They'll help 4 frame some of the background for you all of 5 how we're shaping our strategic planning in the coastal goal to meet the priority 6 7 objective of the National Ocean Policy through 8 our NGSP, Next Generation Strategic Plan. 9 But I also wanted to remark or 10 remind and then share with the returning Panel members when the new Panel members were sworn 11 12 in about two months ago and you had your initial training session in Silver Spring, 13 14 Maryland, the NOAA Chief of Staff Margaret Spring came. And she's currently serving also 15 in the role as Chair of the Committee on 16 17 Marine Transportation System. But she had some remarks that she shared with the ten new 18 19 members, and there were about five points that 20 I was going to pull out of that that we had 21 shared with the new members. I'm not sure if 22 we covered it with the returning members.

|    | Page 90  |
|----|--|
| 1  | So the first point she mentioned               |
| 2  | was: "I would be interested in your thoughts   |
| 3  | on what the CMTS could focus on as well, and   |
| 4  | how NOAA can best engage." So that's the       |
| 5  | Committee on the Marine Transportation System. |
| 6  | And the second                                 |
| 7  | CHAIR WELCH: And if I might,                   |
| 8  | Gerd, the Committee on the Marine              |
| 9  | Transportation System is an intergovernmental  |
| 10 | coordinating committee, I guess, of about 15   |
| 11 | to 20 federal agencies from the Defense        |
| 12 | Department to some environmental agencies and  |
| 13 | everything in between that have some role in   |
| 14 | marine transportation. And like now, NOAA in   |
| 15 | the person of Margaret Spring is the           |
| 16 | Chairperson of that Committee.                 |
| 17 | CAPT. GLANG: The second point                  |
| 18 | that she mentioned, which was also mentioned   |
| 19 | this morning, the National Export Initiative.  |
| 20 | And she's anxious to hear examples of that     |
| 21 | where NOAA's Navigation Services can help to   |
| 22 | support the National Export Initiative.        |

|    | Page 91  |
|----|--|
| 1  | The third one was National Ocean               |
| 2  | Policy. So NOAA's Navigation Services play an  |
| 3  | important role in several of those ocean       |
| 4  | priority objectives which were on that slide   |
| 5  | this morning. And we can go back to that.      |
| б  | The fourth one she mentioned was               |
| 7  | the State of the Union Address from earlier    |
| 8  | this year when President Obama called for the  |
| 9  | U.S. to "win the future through bold           |
| 10 | improvements in infrastructure, innovation and |
| 11 | education." So her comment was she was eager   |
| 12 | to hear our thoughts on how NOAA's Navigation  |
| 13 | Services can contribute to this future.        |
| 14 | And then the fifth and final point             |
| 15 | or theme that she conveyed to the new Panel    |
| 16 | members was specific to the coastal goal,      |
| 17 | which we more formally call it the Resilient   |
| 18 | Coastal Communities and Economies Goal, it's   |
| 19 | one of the four mission goals within our NGSP. |
| 20 | So the intent here for me today is             |
| 21 | to spend this first 20 or 25 minutes that we   |
| 22 | have until the break to sort of throw out      |

|    | Page 9   |
|----|--|
| 1  | those ideas. We can also talk about the        |
| 2  | guidance document that should be in your       |
| 3  | packet that Office of Coast Survey put         |
| 4  | together to help steer you, but really we want |
| 5  | to have an unstructured conversation within    |
| б  | the limits of the recording here. We want to   |
| 7  | make sure we're not talking on top of each     |
| 8  | other. But really encourage the other Panel    |
| 9  | members to ask questions. Maybe you heard      |
| 10 | something in one of these conversations this   |
| 11 | morning or you read something about our        |
| 12 | strategic planning that you want to know more  |
| 13 | about, or put your ideas on the table.         |
| 14 | We have another session 45 minutes             |
| 15 | after the break. And then on Friday afternoon  |
| 16 | the Panel will meet again for a final session  |
| 17 | and, hopefully, we can tease out at that point |
| 18 | something more concrete, something you as a    |
| 19 | panel want to engage in.                       |
| 20 | Any thoughts up to that point?                 |
| 21 | CHAIR WELCH: Gerd, do you know,                |
| 22 | did Margaret Spring have a written copy of her |

2

| i  |  |
|----|--|
|    | Page 93  |
| 1  | remarks, and if she did can we have that       |
| 2  | distributed? Not necessarily now, but to all   |
| 3  | the Panel members?                             |
| 4  | CAPTAIN GLANG: Yes, we can do                  |
| 5  | that later.                                    |
| 6  | CHAIR WELCH: I think those that                |
| 7  | weren't at Silver Spring it only takes five    |
| 8  | minutes to read through them and she's one of  |
| 9  | the senior NOAA leaders. So it's nice to see   |
| 10 | what the leadership at the top is thinking     |
| 11 | about in terms of what this Panel can do.      |
| 12 | CAPTAIN GLANG: So a couple of                  |
| 13 | thoughts. So we want to sort of prime the      |
| 14 | conversation here, let you all talk about what |
| 15 | you're interested in and how you think the     |
| 16 | Panel can best serve the Navigation Services,  |
| 17 | how we can get the most out of this. But also  |
| 18 | think about how you want to carry that out.    |
| 19 | What we'd like to be able to do is             |
| 20 | when the Panel reconvenes in about half a year |
| 21 | is actually share some of your work in some    |
| 22 | form, whether you've met offline in some       |

|    | Page 9  |
|----|---|
| 1  | smaller working group or we shared            |
| 2  | information.                                  |
| 3  | I don't know how many of you have             |
| 4  | prior experience or other experience with     |
| 5  | FACAs or with these kind of board activities. |
| 6  | I'm sure, Ed, you've thought about this a     |
| 7  | little bit.                                   |
| 8  | So there's sort of the strategic              |
| 9  | framework of what we're asking you to look at |
| 10 | and consider, and then there's the kind of    |
| 11 | process or the mechanism of how we might want |
| 12 | you guys to act on that information and more  |
| 13 | fully develop ideas that the can Panel can    |
| 14 | push forward.                                 |
| 15 | CHAIR WELCH: Okay. Gerd, thank                |
| 16 | you.  |
| 17 | I know particularly of the newer              |
| 18 | members, you might be thinking well how can I |
| 19 | think strategically if I don't know too much  |
| 20 | about the day-to-day type of operations of    |
| 21 | this particular part of NOAA. And I know      |
| 22 | that's a challenge, so I think it's incumbent |

4

|    | Page 95  |
|----|--|
| 1  | on those of us that have been here a little    |
| 2  | bit of time to sort of give you some thoughts. |
| 3  | I made a list of several of the                |
| 4  | themes of prior Panel meetings that I think    |
| 5  | possibly might be something that we could get  |
| 6  | into strategically. This is not an exhaustive  |
| 7  | list. And, you know obviously we can't do      |
| 8  | everything on this list. But let me just read  |
| 9  | you some of the things I jotted down.          |
| 10 | There's been some discussion in                |
| 11 | prior Panels about what role NOAA can play in  |
| 12 | ensuring that there is a trained community of  |
| 13 | hydrographers in the country, either to go to  |
| 14 | work in the agencies or be in the private      |
| 15 | sector. And is that a government role? Is      |
| 16 | that a NOAA role? Should it be? Really, I      |
| 17 | guess, my understanding is there are only a    |
| 18 | couple of special universities around the      |
| 19 | country that have concentrations in that. So   |
| 20 | in other words, what role does the Federal     |
| 21 | Government through NOAA have in investing in   |
| 22 | the human part of this infrastructure? So      |

|    | Page 96  |
|----|--|
| 1  | that could be something for discussion.        |
| 2  | One of the early sets of debates               |
| 3  | in the Panel before I came on, Sherri probably |
| 4  | can give us some insight about this, in the    |
| 5  | past there was quite a bit of controversy,     |
| 6  | political controversy about the relative roles |
| 7  | and importance of the private companies that   |
| 8  | engage in hydrography versus the NOAA Corps    |
| 9  | and the Federal Government. You know, should   |
| 10 | the majority of stuff be contracted out, do    |
| 11 | you keep it in-house? How do you balance       |
| 12 | that?  |
| 13 | To me if there are going to be                 |
| 14 | funding constraints on the Federal Government, |
| 15 | obviously there's a renewed question as to how |
| 16 | much should you rely or must you rely on       |
| 17 | private sector resources to do some of the     |
| 18 | work? So, that could be a strategic question.  |
| 19 | Although it's not something in                 |
| 20 | recent years that really has gotten a huge     |
| 21 | amount of attention because I think eventually |
| 22 | a more or less satisfactory balance was struck |

|    | Page 97  |
|----|--|
| 1  | between the private sector and the public      |
| 2  | sector.  |
| 3  | As the Agency moves into new                   |
| 4  | areas, particularly the Arctic, and if budgets |
| 5  | are static, does an expanded concentration on  |
| 6  | Arctic programs necessarily mean a diminished  |
| 7  | concentration on other areas? And if so, is    |
| 8  | that appropriate or wise?                      |
| 9  | I personally have wondered is                  |
| 10 | there way of quantifying I mean this is a      |
| 11 | crude way of saying it. But what unit of       |
| 12 | effort is necessary to make a nautical chart   |
| 13 | in the Arctic versus a nautical in Long Beach  |
| 14 | Harbor? Is there some way of making that       |
| 15 | comparison?                                    |
| 16 | The question of a NOAA vessel and              |
| 17 | other physical resources and whether and how   |
| 18 | to renew them I think is a strategic question. |
| 19 | Also, are there possible new types             |
| 20 | of technology, say unmanned devices that can   |
| 21 | take over a larger role in hydrography?        |
| 22 | A continuing issue is, is there                |

|    | Page 98  |
|----|--|
| 1  | some magic solution to continued funding for   |
| 2  | the NOAA PORTS system, that's a real time      |
| 3  | observing system in many of our commercial     |
| 4  | harbors that has been embraced by a lot of     |
| 5  | users with which really there's never really   |
| б  | been a settled policy decision as to how to    |
| 7  | ensure that these things are funded over the   |
| 8  | long term.                                     |
| 9  | Should there be a renewed effort               |
| 10 | for users of the products to add more of a     |
| 11 | financial contribution towards NOAA's cost of  |
| 12 | producing the products? One example is that    |
| 13 | the State of California a couple of years ago  |
| 14 | engaged in a major sea floor mapping project   |
| 15 | where they actually put a significant amount   |
| 16 | of state funding in matched with federal       |
| 17 | funding. That's not the normal way of doing    |
| 18 | things, but it worked in that particular       |
| 19 | project.                                       |
| 20 | You know if we're going to have                |
| 21 | oil exploration and development in the Arctic  |
| 22 | and that triggers a need for nautical services |

|    | Page 99  |
|----|--|
| 1  | up in the Arctic, should the oil industry as   |
| 2  | part of their lease payments fork over a       |
| 3  | little bit of money into NOAA for supporting   |
| 4  | their efforts up there?                        |
| 5  | If the Defense Department needs                |
| 6  | baseline surveys of harbors for terrorism      |
| 7  | purposes, is that something that NOAA should   |
| 8  | absorb or should the Defense Department make   |
| 9  | a contribution?                                |
| 10 | And then there's sort of a                     |
| 11 | fundamental question that has come before the  |
| 12 | Panel in the past, which is virtually all of   |
| 13 | the weather services around the country,       |
| 14 | extensive weather services, seem to be         |
| 15 | provided at no cost and full federal funding   |
| 16 | to all the users. And, you know what's the     |
| 17 | difference as far as ocean observations and    |
| 18 | navigation type services? The only difference  |
| 19 | I can see in terms of policy is the Weather    |
| 20 | Service got started a long, long time ago and  |
| 21 | navigation services just didn't quite have the |
| 22 | oomph to get the same policies put in place.   |

| 1  |  |
|----|--|
|    | Page 100                                       |
| 1  | So those are some things that I                |
| 2  | just listed that could be the subject of       |
| 3  | strategic type thoughts by the Panel. But      |
| 4  | again, that's not an exhaustive list and other |
| 5  | people are in this meeting and subsequently    |
| 6  | may want to come up with your own suggestions. |
| 7  | But we need to start thinking                  |
| 8  | about that because NOAA does want you know,    |
| 9  | my feeling is the Panel has been doing quite   |
| 10 | a bit of long range thinking previously, but   |
| 11 | we might not have called it strategic          |
| 12 | thinking. But NOAA leadership is making a      |
| 13 | very specific request to us that we think      |
| 14 | strategically and label it accordingly, and we |
| 15 | need to respond.                               |
| 16 | Lawson?  |
| 17 | MEMBER BRIGHAM: Lawson Brigham                 |
| 18 | from Alaska.                                   |
| 19 | I'll give you one number, since                |
| 20 | you were asking for quantitative information.  |
| 21 | Six to seven percent charitably of the Arctic  |
| 22 | Ocean is charted to international navigation   |

|    | Page 101                                       |
|----|--|
| 1  | standards. It would be nice for NOAA to come   |
| 2  | up with a number, of sorts, for the United     |
| 3  | States Arctic for all our EEZ.                 |
| 4  | I can't believe its more than 10               |
| 5  | percent, 15 percent to navigational you        |
| б  | know, where you can take a ship and sail it    |
| 7  | across. It's a useful number because if        |
| 8  | you're talking about marine safety and         |
| 9  | environmental protection not even touching the |
| 10 | maritime trade facilitation question, just for |
| 11 | safety and environmental protection we don't   |
| 12 | have any charts. And the whole of the Arctic   |
| 13 | doesn't have any charts.                       |
| 14 | So I'll tell you tomorrow that                 |
| 15 | there's a lot of activity. There's a lot of    |
| 16 | ships that are operating in the Arctic,        |
| 17 | including some of the largest cruise ships and |
| 18 | some large bulk carriers. They're operating    |
| 19 | with, let's just say few charts. So as all     |
| 20 | the other gizmos and great capability today,   |
| 21 | there's not enough hydrography and charting.   |
| 22 | So I think we need some numbers.               |

Page 102 Like, I agree with you, Ed, that 1 2 when we're talking to the Congress or talking to other agencies of the United States 3 4 Government, we need to put at least Arctic in 5 context with -- at least quantitatively, a 6 little bit and what does it mean. 7 Can I make one more comment? 8 CHAIR WELCH: Sure, please. 9 MEMBER BRIGHAM: On the national ocean policy stuff, from what Gerd said and 10 what you said, David, this morning I think the 11 12 promotion of it has been environmental stewardship, or at least I'll give you my 13 14 citizen's perspective on it, and not enough environmental security and economic security, 15 16 an economic component to it. I mean, I think 17 it's all mixed together. I think I understand 18 the concept. But the economic security part 19 of it it doesn't seem to get enough play, 20 maybe more at the meetings currently going on 21 in Washington. But it sounded to me 22 exclusionary, protection and not enough, hey,

|    | Page 103                                       |
|----|--|
| 1  | this is all about economics and trade and use  |
| 2  | of the oceans and facilitating that use.       |
| 3  | So, I think you came around to                 |
| 4  | that in your talk in the end, but I thought    |
| 5  | the promotion of it still is a little bit too  |
| 6  | even though I support it from a safety and     |
| 7  | environmental protection standpoint,           |
| 8  | environmental stewardship maybe is not defined |
| 9  | holistically, maybe. I don't know. Just a      |
| 10 | challenge.                                     |
| 11 | CHAIR WELCH: Yes, please, David,               |
| 12 | can  |
| 13 | MR. KENNEDY: Just in terms of                  |
| 14 | maybe a strategic thought. Something from      |
| 15 | this Panel commenting on the Ocean Policy      |
| 16 | and/or what may be the more specific comments  |
| 17 | on the pieces that are relevant, might be very |
| 18 | useful. I think that's a great observation     |
| 19 | and I guess from my close and personal         |
| 20 | experience you're not that far off.            |
| 21 | Conceptually I don't think that's              |
| 22 | what they have in mind, but that does seem to  |
|    |  |

| Page 1041be the projection. And so something just to2keep I think in all of your minds you think3about what you might want to address that4might be pretty strategic and useful is some5comments back from this Panel to the6organizers of the Ocean Policy about what you7think is important and maybe what they need to8be stressing that you don't think they are.9So, I think that's a great comment.10CHAIR WELCH: If I could make an11observation and then we'll turn it to Joyce.12The coordinating agency for the13National Oceans Policy is in the White House,14but it's the White House Council on15Environmental Quality. So that says a lot just16in and of itself.17MR. KENNEDY: Yes.18CHAIR WELCH: And as you were19speaking, both of you were speaking, I was20thinking perhaps at a relatively soon21forthcoming meeting of this Panel maybe we22ought to consider having a couple of people   | 1  |  |
|---|----|--|
| 2keep I think in all of your minds you think3about what you might want to address that4might be pretty strategic and useful is some5comments back from this Panel to the6organizers of the Ocean Policy about what you7think is important and maybe what they need to8be stressing that you don't think they are.9So, I think that's a great comment.10CHAIR WELCH: If I could make an11observation and then we'll turn it to Joyce.12The coordinating agency for the13National Oceans Policy is in the White House,14but it's the White House Council on15Environmental Quality. So that says a lot just16in and of itself.17MR. KENNEDY: Yes.18CHAIR WELCH: And as you were19speaking, both of you were speaking, I was20thinking perhaps at a relatively soon21forthcoming meeting of this Panel maybe we  |    | Page 104                                       |
| 3       about what you might want to address that         4       might be pretty strategic and useful is some         5       comments back from this Panel to the         6       organizers of the Ocean Policy about what you         7       think is important and maybe what they need to         8       be stressing that you don't think they are.         9       So, I think that's a great comment.         10       CHAIR WELCH: If I could make an         11       observation and then we'll turn it to Joyce.         12       The coordinating agency for the         13       National Oceans Policy is in the White House,         14       but it's the White House Council on         15       Environmental Quality. So that says a lot just         16       in and of itself.         17       MR. KENNEDY: Yes.         18       CHAIR WELCH: And as you were         19       speaking, both of you were speaking, I was         20       thinking perhaps at a relatively soon         21       forthcoming meeting of this Panel maybe we | 1  | be the projection. And so something just to    |
| <ul> <li>might be pretty strategic and useful is some</li> <li>comments back from this Panel to the</li> <li>organizers of the Ocean Policy about what you</li> <li>think is important and maybe what they need to</li> <li>be stressing that you don't think they are.</li> <li>So, I think that's a great comment.</li> <li>CHAIR WELCH: If I could make an</li> <li>observation and then we'll turn it to Joyce.</li> <li>The coordinating agency for the</li> <li>National Oceans Policy is in the White House,</li> <li>but it's the White House Council on</li> <li>Environmental Quality. So that says a lot just</li> <li>in and of itself.</li> <li>MR. KENNEDY: Yes.</li> <li>CHAIR WELCH: And as you were</li> <li>speaking, both of you were speaking, I was</li> <li>thinking perhaps at a relatively soon</li> <li>forthcoming meeting of this Panel maybe we</li> </ul>  | 2  | keep I think in all of your minds you think    |
| <ul> <li>comments back from this Panel to the</li> <li>organizers of the Ocean Policy about what you</li> <li>think is important and maybe what they need to</li> <li>be stressing that you don't think they are.</li> <li>So, I think that's a great comment.</li> <li>CHAIR WELCH: If I could make an</li> <li>observation and then we'll turn it to Joyce.</li> <li>The coordinating agency for the</li> <li>National Oceans Policy is in the White House,</li> <li>but it's the White House Council on</li> <li>Environmental Quality. So that says a lot just</li> <li>in and of itself.</li> <li>MR. KENNEDY: Yes.</li> <li>CHAIR WELCH: And as you were</li> <li>speaking, both of you were speaking, I was</li> <li>thinking perhaps at a relatively soon</li> <li>forthcoming meeting of this Panel maybe we</li> </ul>  | 3  | about what you might want to address that      |
| <ul> <li>organizers of the Ocean Policy about what you</li> <li>think is important and maybe what they need to</li> <li>be stressing that you don't think they are.</li> <li>So, I think that's a great comment.</li> <li>CHAIR WELCH: If I could make an</li> <li>observation and then we'll turn it to Joyce.</li> <li>The coordinating agency for the</li> <li>National Oceans Policy is in the White House,</li> <li>but it's the White House Council on</li> <li>Environmental Quality. So that says a lot just</li> <li>in and of itself.</li> <li>MR. KENNEDY: Yes.</li> <li>CHAIR WELCH: And as you were</li> <li>speaking, both of you were speaking, I was</li> <li>thinking perhaps at a relatively soon</li> <li>forthcoming meeting of this Panel maybe we</li> </ul>  | 4  | might be pretty strategic and useful is some   |
| <ul> <li>think is important and maybe what they need to</li> <li>be stressing that you don't think they are.</li> <li>So, I think that's a great comment.</li> <li>CHAIR WELCH: If I could make an</li> <li>observation and then we'll turn it to Joyce.</li> <li>The coordinating agency for the</li> <li>National Oceans Policy is in the White House,</li> <li>but it's the White House Council on</li> <li>Environmental Quality. So that says a lot just</li> <li>in and of itself.</li> <li>MR. KENNEDY: Yes.</li> <li>CHAIR WELCH: And as you were</li> <li>speaking, both of you were speaking, I was</li> <li>thinking perhaps at a relatively soon</li> <li>forthcoming meeting of this Panel maybe we</li> </ul>   | 5  | comments back from this Panel to the           |
| <ul> <li>be stressing that you don't think they are.</li> <li>So, I think that's a great comment.</li> <li>CHAIR WELCH: If I could make an</li> <li>observation and then we'll turn it to Joyce.</li> <li>The coordinating agency for the</li> <li>National Oceans Policy is in the White House,</li> <li>but it's the White House Council on</li> <li>Environmental Quality. So that says a lot just</li> <li>in and of itself.</li> <li>MR. KENNEDY: Yes.</li> <li>CHAIR WELCH: And as you were</li> <li>speaking, both of you were speaking, I was</li> <li>thinking perhaps at a relatively soon</li> <li>forthcoming meeting of this Panel maybe we</li> </ul>   | 6  | organizers of the Ocean Policy about what you  |
| <ul> <li>So, I think that's a great comment.</li> <li>CHAIR WELCH: If I could make an</li> <li>observation and then we'll turn it to Joyce.</li> <li>The coordinating agency for the</li> <li>National Oceans Policy is in the White House,</li> <li>but it's the White House Council on</li> <li>Environmental Quality. So that says a lot just</li> <li>in and of itself.</li> <li>MR. KENNEDY: Yes.</li> <li>CHAIR WELCH: And as you were</li> <li>speaking, both of you were speaking, I was</li> <li>thinking perhaps at a relatively soon</li> <li>forthcoming meeting of this Panel maybe we</li> </ul>  | 7  | think is important and maybe what they need to |
| 10 CHAIR WELCH: If I could make an<br>11 observation and then we'll turn it to Joyce.<br>12 The coordinating agency for the<br>13 National Oceans Policy is in the White House,<br>14 but it's the White House Council on<br>15 Environmental Quality. So that says a lot just<br>16 in and of itself.<br>17 MR. KENNEDY: Yes.<br>18 CHAIR WELCH: And as you were<br>19 speaking, both of you were speaking, I was<br>20 thinking perhaps at a relatively soon<br>21 forthcoming meeting of this Panel maybe we   | 8  | be stressing that you don't think they are.    |
| 11 observation and then we'll turn it to Joyce.<br>12 The coordinating agency for the<br>13 National Oceans Policy is in the White House,<br>14 but it's the White House Council on<br>15 Environmental Quality. So that says a lot just<br>16 in and of itself.<br>17 MR. KENNEDY: Yes.<br>18 CHAIR WELCH: And as you were<br>19 speaking, both of you were speaking, I was<br>20 thinking perhaps at a relatively soon<br>21 forthcoming meeting of this Panel maybe we   | 9  | So, I think that's a great comment.            |
| 12The coordinating agency for the13National Oceans Policy is in the White House,14but it's the White House Council on15Environmental Quality. So that says a lot just16in and of itself.17MR. KENNEDY: Yes.18CHAIR WELCH: And as you were19speaking, both of you were speaking, I was20thinking perhaps at a relatively soon21forthcoming meeting of this Panel maybe we  | 10 | CHAIR WELCH: If I could make an                |
| 13 National Oceans Policy is in the White House,<br>14 but it's the White House Council on<br>15 Environmental Quality. So that says a lot just<br>16 in and of itself.<br>17 MR. KENNEDY: Yes.<br>18 CHAIR WELCH: And as you were<br>19 speaking, both of you were speaking, I was<br>20 thinking perhaps at a relatively soon<br>21 forthcoming meeting of this Panel maybe we  | 11 | observation and then we'll turn it to Joyce.   |
| 14 but it's the White House Council on<br>15 Environmental Quality. So that says a lot just<br>16 in and of itself.<br>17 MR. KENNEDY: Yes.<br>18 CHAIR WELCH: And as you were<br>19 speaking, both of you were speaking, I was<br>20 thinking perhaps at a relatively soon<br>21 forthcoming meeting of this Panel maybe we  | 12 | The coordinating agency for the                |
| 15 Environmental Quality. So that says a lot just<br>16 in and of itself.<br>17 MR. KENNEDY: Yes.<br>18 CHAIR WELCH: And as you were<br>19 speaking, both of you were speaking, I was<br>20 thinking perhaps at a relatively soon<br>21 forthcoming meeting of this Panel maybe we  | 13 | National Oceans Policy is in the White House,  |
| <pre>16 in and of itself. 17 MR. KENNEDY: Yes. 18 CHAIR WELCH: And as you were 19 speaking, both of you were speaking, I was 20 thinking perhaps at a relatively soon 21 forthcoming meeting of this Panel maybe we</pre>   | 14 | but it's the White House Council on            |
| 17MR. KENNEDY: Yes.18CHAIR WELCH: And as you were19speaking, both of you were speaking, I was20thinking perhaps at a relatively soon21forthcoming meeting of this Panel maybe we  | 15 | Environmental Quality. So that says a lot just |
| 18CHAIR WELCH: And as you were19speaking, both of you were speaking, I was20thinking perhaps at a relatively soon21forthcoming meeting of this Panel maybe we   | 16 | in and of itself.                              |
| 19 speaking, both of you were speaking, I was<br>20 thinking perhaps at a relatively soon<br>21 forthcoming meeting of this Panel maybe we  | 17 | MR. KENNEDY: Yes.                              |
| 20 thinking perhaps at a relatively soon 21 forthcoming meeting of this Panel maybe we  | 18 | CHAIR WELCH: And as you were                   |
| 21 forthcoming meeting of this Panel maybe we   | 19 | speaking, both of you were speaking, I was     |
|   | 20 | thinking perhaps at a relatively soon          |
| 22 ought to consider having a couple of people  | 21 | forthcoming meeting of this Panel maybe we     |
|   | 22 | ought to consider having a couple of people    |

|    | Page 105                                       |
|----|--|
| 1  | from the Council on Environmental Quality come |
| 2  | make a presentation. And rather than just us   |
| 3  | submitting a couple of papers, have them       |
| 4  | subjected to having to interact with us over   |
| 5  | a few hours.                                   |
| 6  | Joyce?   |
| 7  | MEMBER MILLER: Yes. A follow-up                |
| 8  | to that and then sort of a question of the     |
| 9  | sort of level of the Panel.                    |
| 10 | But I was recently reading Dr.                 |
| 11 | Lubchenco's report to Congress, and I got to   |
| 12 | the end of it and I searched for the word      |
| 13 | "ships" or "survey" or "mapping" and I didn't  |
| 14 | find much. And it concerned me, you know,      |
| 15 | being on this Panel because it just seems like |
| 16 | a lot of infrastructure needed for             |
| 17 | environmental safety and so forth sits with    |
| 18 | Navigation Services, and yet it's not really   |
| 19 | a focus, I would say.                          |
| 20 | And then my following question is,             |
| 21 | as a new member, this is sort of a question to |
| 22 | the older members and Ed, and so forth. Okay.  |

|    | Page 106                                       |
|----|--|
| 1  | We're advising Dr. Lubchenco, right, is that   |
| 2  | correct?                                       |
| 3  | CHAIR WELCH: Essentially that's                |
| 4  | correct. Dr. Lubchenco and her senior staff.   |
| 5  | MEMBER MILLER: And I'm reading                 |
| б  | the previous, the 2007 report and the 2010     |
| 7  | report, and the first thing that it says is    |
| 8  | "more emphasis on mapping," more mapping which |
| 9  | translates really into more funding. You       |
| 10 | know, to what extent can she or her senior     |
| 11 | advisors really you know, I guess my           |
| 12 | question is at what level can we provide       |
| 13 | useful advice? Saying get more money is        |
| 14 | you know, so what is it that we as a Panel     |
| 15 | really can do, I guess is my question, and at  |
| 16 | what level do we advise, since this is a NOAA  |
| 17 | Panel and not a national panel, et cetera?     |
| 18 | And I'll leave it open to anybody              |
| 19 | who has thoughts on it.                        |
| 20 | CHAIR WELCH: Well, let me make a               |
| 21 | comment and then perhaps some of the previous  |
| 22 | members may want to comment. And I'm speaking  |

Page 107 1 for the earlier panels. 2 I think when they initially started and when they initially did the first 3 version of the most wanted hydrographic 4 5 improvements, the Panel felt like it was 6 important to give the Agency an outside, a 7 non-Agency document that the Agency could 8 point to highlighting the needs for more: 9 More charting, more effort, more money. And 10 stating why, and stating how far short of the ideal the status quo was. 11 12 And so there was a sense first that the Agency, if they wished to, could use 13 14 this document to help buttress their case that 15 they made to the Department of Commerce, to 16 the Office of Management and Budget, to Congress, to whoever. So I think that that 17 was sort of the fundamental thought of the 18 19 original membership of this Panel in producing 20 the original document. 21 Sherri, you were there. Is there 22 any observation you would make along those

|    | Page 108                                       |
|----|--|
| 1  | lines?   |
| 2  | MEMBER HICKMAN: Yes. I know,                   |
| 3  | like, when we came up with that, a big part of |
| 4  | it was it's always the budget. So where are    |
| 5  | you going to take it from to put it where you  |
| 6  | need it? At that time, the critical areas      |
| 7  | that needed to be surveyed were 16 years in    |
| 8  | arrears. And if we put all the money into the  |
| 9  | critical areas: Alaska which doesn't have      |
| 10 | much mapping at all for the timely mapping we  |
| 11 | should say, we'd still be 16 years in arrears  |
| 12 | by the time we got we'd have another 16        |
| 13 | years of critical.                             |
| 14 | So, we also decided if you only                |
| 15 | had this much money and you're going to either |
| 16 | outsource it to private or keep it in-house,   |
| 17 | it's still the same amount of money. We also   |
| 18 | decided that we needed to keep in-house        |
| 19 | because you need in-house expertise to spec    |
| 20 | out a contract to private industry. So a lot   |
| 21 | of that is where that came from. Also with     |
| 22 | the PORTS program. We were trying to get the   |
|    | Page 109                                       |
|----|--|
| 1  | funding, but it's all down to money.           |
| 2  | Everything's down to money.                    |
| 3  | So where are you going to take it              |
| 4  | from if you're going to keep the budget the    |
| 5  | same? Where are you going to remove it from    |
| 6  | for our priorities of that initial report?     |
| 7  | CHAIR WELCH: The revised report,               |
| 8  | which was done while I was part of the Panel   |
| 9  | and finalized last year, was frankly, as much  |
| 10 | of anything, a political decision. And this    |
| 11 | report was a group of folks who, for the most, |
| 12 | left the Panel given to the Bush               |
| 13 | Administration. And there was a sense that     |
| 14 | the new people, particularly folks needed to   |
| 15 | say to the Obama Administration "You know,     |
| 16 | this might have been a Bush era document, but  |
| 17 | it's still the main themes are still pretty    |
| 18 | much what we agreed on."                       |
| 19 | So you will see that the '11                   |
| 20 | document is not all that much different than   |
| 21 | the `07. And so that was the purpose.          |
| 22 | Now that I'm hearing the Agency                |

Page 110 say to us, and of course they're going to push 1 2 for their best budget that they can get, but there are constraints, and they're saying to 3 us if you accept, if everybody accept that 4 5 there are going to be constraints, we're not going to get to the ideal anytime soon, what 6 7 advice can you, the Panel, give to us, the 8 Agency, about how to operate and what 9 priorities to set in constrained budget conditions? 10 And so that's a slightly different 11 12 task then what the original Panel set out to 13 And I think it's a very valid task, and do. 14 I think it's realistic. And obviously this document still stands. 15 16 This document, I think, was useful 17 to the Agency a couple of years ago when the 18 President Stimulus Proposal came in. Because 19 NOAA's National Ocean Service was able to make 20 a case to NOAA's leadership, which was able to 21 make a case to the Department of Commerce, 22 which was able to make a case to Congress

|    | Page 111                                       |
|----|--|
| 1  | successfully that there are ought to be a      |
| 2  | fairly significant infusion into the Stimulus  |
| 3  | bill for some expanded navigation services and |
| 4  | charting. And it didn't solve all the          |
| 5  | problems, by any means, but it could have been |
| 6  | very easily for them to have gotten skunked    |
| 7  | when that Stimulus bill was put together. And  |
| 8  | I think having this as a baseline document     |
| 9  | helped them make the case.                     |
| 10 | David, did you have a comment?                 |
| 11 | MR. KENNEDY: I did. And at the                 |
| 12 | risk of dominating the conversation, I wanted  |
| 13 | to maybe address some of what Joyce just       |
| 14 | asked. And I think two points, one I forgot    |
| 15 | to make this morning.                          |
| 16 | Dr. Lubchenco takes these advisory             |
| 17 | committees extremely seriously. You know,      |
| 18 | I've seen the past, yes, yes, we got these     |
| 19 | committees and whatever. So (1) I think we     |
| 20 | have an opportunity in that she really has     |
| 21 | been at the table in talking about the         |
| 22 | candidacy and the importance of getting the    |

| Page 1121right people here. I mean, Dr. Lubchenco2personally clears this kind of stuff.3So, one, very important. And I4think that leads to an opportunity because she5does pay attention, she thinks that committees6are important and I think she'll listen.7Two, the part that I missed this8morning is, Dr. Lubchenco has been under-9staffed since she's begun. Hasn't had a chief10scientist, kind of restructured and had two11major kind of assistants, deputy assistants.12One is kind of on the environmental ecosystem13side, and that's Dr. Larry Robinson, who has14been here. But on the observational side, the15side that gets closer to the kinds of things16we're talking about today, she's not had17anyone.18And she announced, I think today19to the world something we've known for a20anybody remember the title? I actually wrote21atybody remember the title? I actually wrote22it down somewhere, probably can't read it. |    |  |
|--|----|--|
| 2personally clears this kind of stuff.3So, one, very important. And I4think that leads to an opportunity because she5does pay attention, she thinks that committees6are important and I think she'll listen.7Two, the part that I missed this8morning is, Dr. Lubchenco has been under-9staffed since she's begun. Hasn't had a chief10scientist, kind of restructured and had two11major kind of assistants, deputy assistants.12One is kind of on the environmental ecosystem13side, and that's Dr. Larry Robinson, who has14been here. But on the observational side, the15side that gets closer to the kinds of things16we're talking about today, she's not had17anyone.18And she announced, I think today19to the world something we've known for a20while, that she has that second does21anybody remember the title? I actually wrote  |    | Page 112                                       |
| 3So, one, very important. And I4think that leads to an opportunity because she5does pay attention, she thinks that committees6are important and I think she'll listen.7Two, the part that I missed this8morning is, Dr. Lubchenco has been under-9staffed since she's begun. Hasn't had a chief10scientist, kind of restructured and had two11major kind of assistants, deputy assistants.12One is kind of on the environmental ecosystem13side, and that's Dr. Larry Robinson, who has14been here. But on the observational side, the15side that gets closer to the kinds of things16we're talking about today, she's not had17anyone.18And she announced, I think today19to the world something we've known for a20while, that she has that second does21anybody remember the title? I actually wrote  | 1  | right people here. I mean, Dr. Lubchenco       |
| <ul> <li>think that leads to an opportunity because she</li> <li>does pay attention, she thinks that committees</li> <li>are important and I think she'll listen.</li> <li>Two, the part that I missed this</li> <li>morning is, Dr. Lubchenco has been under-</li> <li>staffed since she's begun. Hasn't had a chief</li> <li>scientist, kind of restructured and had two</li> <li>major kind of assistants, deputy assistants.</li> <li>One is kind of on the environmental ecosystem</li> <li>side, and that's Dr. Larry Robinson, who has</li> <li>been here. But on the observational side, the</li> <li>side that gets closer to the kinds of things</li> <li>we're talking about today, she's not had</li> <li>anyone.</li> <li>And she announced, I think today</li> <li>to the world something we've known for a</li> <li>while, that she has that second does</li> <li>anybody remember the title? I actually wrote</li> </ul>           | 2  | personally clears this kind of stuff.          |
| 5does pay attention, she thinks that committees6are important and I think she'll listen.7Two, the part that I missed this8morning is, Dr. Lubchenco has been under-9staffed since she's begun. Hasn't had a chief10scientist, kind of restructured and had two11major kind of assistants, deputy assistants.12One is kind of on the environmental ecosystem13side, and that's Dr. Larry Robinson, who has14been here. But on the observational side, the15side that gets closer to the kinds of things16we're talking about today, she's not had17anyone.18And she announced, I think today19to the world something we've known for a20while, that she has that second does21anybody remember the title? I actually wrote  | 3  | So, one, very important. And I                 |
| <ul> <li>are important and I think she'll listen.</li> <li>Two, the part that I missed this</li> <li>morning is, Dr. Lubchenco has been under-</li> <li>staffed since she's begun. Hasn't had a chief</li> <li>scientist, kind of restructured and had two</li> <li>major kind of assistants, deputy assistants.</li> <li>One is kind of on the environmental ecosystem</li> <li>side, and that's Dr. Larry Robinson, who has</li> <li>been here. But on the observational side, the</li> <li>side that gets closer to the kinds of things</li> <li>we're talking about today, she's not had</li> <li>anyone.</li> <li>And she announced, I think today</li> <li>to the world something we've known for a</li> <li>while, that she has that second does</li> <li>anybody remember the title? I actually wrote</li> </ul>   | 4  | think that leads to an opportunity because she |
| 7Two, the part that I missed this8morning is, Dr. Lubchenco has been under-9staffed since she's begun. Hasn't had a chief10scientist, kind of restructured and had two11major kind of assistants, deputy assistants.12One is kind of on the environmental ecosystem13side, and that's Dr. Larry Robinson, who has14been here. But on the observational side, the15side that gets closer to the kinds of things16we're talking about today, she's not had17anyone.18And she announced, I think today19to the world something we've known for a20while, that she has that second does21anybody remember the title? I actually wrote  | 5  | does pay attention, she thinks that committees |
| 8 morning is, Dr. Lubchenco has been under-<br>9 staffed since she's begun. Hasn't had a chief<br>10 scientist, kind of restructured and had two<br>11 major kind of assistants, deputy assistants.<br>12 One is kind of on the environmental ecosystem<br>13 side, and that's Dr. Larry Robinson, who has<br>14 been here. But on the observational side, the<br>15 side that gets closer to the kinds of things<br>16 we're talking about today, she's not had<br>17 anyone.<br>18 And she announced, I think today<br>19 to the world something we've known for a<br>20 while, that she has that second does<br>21 anybody remember the title? I actually wrote   | 6  | are important and I think she'll listen.       |
| <ul> <li>staffed since she's begun. Hasn't had a chief</li> <li>scientist, kind of restructured and had two</li> <li>major kind of assistants, deputy assistants.</li> <li>One is kind of on the environmental ecosystem</li> <li>side, and that's Dr. Larry Robinson, who has</li> <li>been here. But on the observational side, the</li> <li>side that gets closer to the kinds of things</li> <li>we're talking about today, she's not had</li> <li>anyone.</li> <li>And she announced, I think today</li> <li>to the world something we've known for a</li> <li>while, that she has that second does</li> <li>anybody remember the title? I actually wrote</li> </ul>  | 7  | Two, the part that I missed this               |
| <ul> <li>scientist, kind of restructured and had two</li> <li>major kind of assistants, deputy assistants.</li> <li>One is kind of on the environmental ecosystem</li> <li>side, and that's Dr. Larry Robinson, who has</li> <li>been here. But on the observational side, the</li> <li>side that gets closer to the kinds of things</li> <li>we're talking about today, she's not had</li> <li>anyone.</li> <li>And she announced, I think today</li> <li>to the world something we've known for a</li> <li>while, that she has that second does</li> <li>anybody remember the title? I actually wrote</li> </ul>   | 8  | morning is, Dr. Lubchenco has been under-      |
| 11 major kind of assistants, deputy assistants. 12 One is kind of on the environmental ecosystem 13 side, and that's Dr. Larry Robinson, who has 14 been here. But on the observational side, the 15 side that gets closer to the kinds of things 16 we're talking about today, she's not had 17 anyone. 18 And she announced, I think today 19 to the world something we've known for a while, that she has that second does 21 anybody remember the title? I actually wrote  | 9  | staffed since she's begun. Hasn't had a chief  |
| 12One is kind of on the environmental ecosystem13side, and that's Dr. Larry Robinson, who has14been here. But on the observational side, the15side that gets closer to the kinds of things16we're talking about today, she's not had17anyone.18And she announced, I think today19to the world something we've known for a20while, that she has that second does21anybody remember the title? I actually wrote  | 10 | scientist, kind of restructured and had two    |
| 13 side, and that's Dr. Larry Robinson, who has<br>14 been here. But on the observational side, the<br>15 side that gets closer to the kinds of things<br>16 we're talking about today, she's not had<br>17 anyone.<br>18 And she announced, I think today<br>19 to the world something we've known for a<br>20 while, that she has that second does<br>21 anybody remember the title? I actually wrote  | 11 | major kind of assistants, deputy assistants.   |
| 14 been here. But on the observational side, the<br>15 side that gets closer to the kinds of things<br>16 we're talking about today, she's not had<br>17 anyone.<br>18 And she announced, I think today<br>19 to the world something we've known for a<br>20 while, that she has that second does<br>21 anybody remember the title? I actually wrote   | 12 | One is kind of on the environmental ecosystem  |
| 15 side that gets closer to the kinds of things<br>16 we're talking about today, she's not had<br>17 anyone.<br>18 And she announced, I think today<br>19 to the world something we've known for a<br>20 while, that she has that second does<br>21 anybody remember the title? I actually wrote   | 13 | side, and that's Dr. Larry Robinson, who has   |
| <pre>16 we're talking about today, she's not had<br/>17 anyone.<br/>18 And she announced, I think today<br/>19 to the world something we've known for a<br/>20 while, that she has that second does<br/>21 anybody remember the title? I actually wrote</pre>  | 14 | been here. But on the observational side, the  |
| <pre>17 anyone. 17 anyone. 18 And she announced, I think today 19 to the world something we've known for a 20 while, that she has that second does 21 anybody remember the title? I actually wrote</pre>   | 15 | side that gets closer to the kinds of things   |
| And she announced, I think today<br>to the world something we've known for a<br>while, that she has that second does<br>anybody remember the title? I actually wrote   | 16 | we're talking about today, she's not had       |
| 19 to the world something we've known for a 20 while, that she has that second does 21 anybody remember the title? I actually wrote  | 17 | anyone.  |
| 20 while, that she has that second does 21 anybody remember the title? I actually wrote  | 18 | And she announced, I think today               |
| 21 anybody remember the title? I actually wrote  | 19 | to the world something we've known for a       |
|  | 20 | while, that she has that second does           |
| 22 it down somewhere, probably can't read it.  | 21 | anybody remember the title? I actually wrote   |
|  | 22 | it down somewhere, probably can't read it.     |

|    | Page 113                                       |
|----|--|
| 1  | CAPTAIN GLANG: It's Assistant                  |
| 2  | Secretary for Observations and Predictions.    |
| 3  | MR. KENNEDY: Yes. That's it.                   |
| 4  | And so she announced today that                |
| 5  | that is Kathy Sullivan, Dr. Kathy Sullivan, an |
| 6  | ex-astronaut, well respected in the community. |
| 7  | Oh, there we go. And she starts May 9th.       |
| 8  | And the importance there is that I             |
| 9  | think what the message needs to be as much as  |
| 10 | anything, and it's kind of message that I've   |
| 11 | been talking about a lot is, you look at       |
| 12 | previous Administrations, previous strategic   |
| 13 | plans, previous national priorities and then   |
| 14 | you try and find where the National Ocean      |
| 15 | Service fit; you had a hard time doing that.   |
| 16 | You don't anymore. You don't anymore. And      |
| 17 | that's kind of the point I was trying to make  |
| 18 | up here, and the point that I'm making to all  |
| 19 | of my troops is we're players, but we've got   |
| 20 | to go sell ourselves. And we're new to this    |
| 21 | game because we haven't been able to say "Look |
| 22 | at that National Ocean Policy and look at      |

Page 114 1 where all we fit." 2 Now we have strategic plan in NOAA and we have an annual guidance memorandum. 3 4 And every place you go the Ocean Service 5 really has a very specific role that you don't 6 have to be embarrassed to try and wind your 7 way through a bunch of explanations to show 8 how you fit. And I think that is the one 9 thing that I'm hoping you guys can help, is carry that message of "Hey, this Nav Services 10 bunch, they do count and here's how they count 11 12 and they're very important to the economy and they're important to us" in whatever ways you 13 14 decide you might want to do that. So that gets back to: 15 16 (1) We got an Administrator that 17 I think is listening, and; 18 (2)I think we have an advocacy 19 that really can help at a high level to help 20 carry that message and further establish the 21 importance of some of the things we're doing. 22 So, sorry for the speech.

|    | Page 115                                      |
|----|---|
| 1  | CHAIR WELCH: No. Thanks very                  |
| 2  | much, David.                                  |
| 3  | And I think probably we ought to              |
| 4  | take our break now and come back and continue |
| 5  | the discussion.                               |
| 6  | But I would like to say, Joyce, in            |
| 7  | the past couple of meetings we have had very  |
| 8  | senior NOAA leadership here. We had Margaret  |
| 9  | Spring, who is Dr. Lubchenco Chief of Staff,  |
| 10 | and you met her in Silver Spring. And Dr.     |
| 11 | Robinson came to our meeting up in Vancouver, |
| 12 | Washington. And we are still very hopeful and |
| 13 | want to be very aggressive in pursuing Dr.    |
| 14 | Lubchenco to come to as early as possible     |
| 15 | meeting as we can. We haven't had her yet,    |
| 16 | and the previous panels have had previous     |
| 17 | administrators. So, we hope that we can get   |
| 18 | her. Find a date, find a location that she    |
| 19 | can be part of our program. And that is       |
| 20 | you know if we're going to be thinking        |
| 21 | strategically, we want the strategic head of  |
| 22 | the Agency to be part of our efforts.         |

|    | Page 116                                      |
|----|---|
| 1  | So with that, let's take a break              |
| 2  | of how long? Fifteen minutes. So if           |
|    |   |
| 3  | everybody can be back in place at 11:00.      |
| 4  | (Whereupon, the above-entitled                |
| 5  | matter went off the record at 10:45 a.m. and  |
| 6  | resumed at 11:05 a.m.)                        |
| 7  | CHAIR WELCH: Okay. Let's resume               |
| 8  | our discussion with Captain Glang. But I want |
| 9  | to first recognize Gary Jeffress for a        |
| 10 | comment.                                      |
| 11 | MEMBER JEFFRESS: Hi. Gary                     |
| 12 | Jeffress, Texas A&M, Corpus Christi.          |
| 13 | I heard in Joyce's comments about             |
| 14 | who is listening to us. One of the things     |
| 15 | that I and, by the way, I forgot to mention   |
| 16 | that I'm a three term as well. Came on with   |
| 17 | Ed and Tom.                                   |
| 18 | One of the things I've learned in             |
| 19 | that three years is that the main             |
| 20 | congressional sponsors of NOAA are coastal    |
| 21 | states and coastal congressional              |
| 22 | representatives. And, of course, there's a    |

|    | Page 117                                       |
|----|--|
| 1  | bunch more landlocked electoral districts than |
| 2  | there are coastal districts. And so that's     |
| 3  | one of the political hurdles that we've got to |
| 4  | get over.                                      |
| 5  | And that goes back to what Dave                |
| 6  | was asking us to do because obviously the work |
| 7  | that NOAA does associate with the economy and  |
| 8  | creating jobs, which is the highest priority   |
| 9  | that the nation is facing right now.           |
| 10 | And one of the ways we can                     |
| 11 | highlight that is, which came out of our       |
| 12 | Portland meeting, was that the port of         |
| 13 | Portland is a big major conduit for exports,   |
| 14 | but not just from Oregon, but from all the     |
| 15 | landlocked states up the river and up to the   |
| 16 | Dakotas. And so all of these landlocked states |
| 17 | are producing exports which have to get to     |
| 18 | their market through the ports, but those      |
| 19 | congressional representatives don't see that.  |
| 20 | And we need to highlight the association       |
| 21 | between ports and the exports that are         |
| 22 | generated in non-coastal states, and I think   |

|    | Page 118                                     |
|----|--|
| 1  | that's going to be fairly easy to do.        |
| 2  | And another thing that's happening           |
| 3  | right, which is actually going to accelerate |
| 4  | the National Export Initiatives is the fact  |
| 5  | that the American dollar has gone down       |
| 6  | compared to the major countries around the   |
| 7  | world which makes exports a lot cheaper. And |
| 8  | so we're going to see over the next year or  |
| 9  | two a large increase in exports in           |
| 10 | agricultural products. Also in the major     |
| 11 | press a lot of data on shortage of food      |
| 12 | worldwide. So America's breadbasket is going |
| 13 | to step up to take advantage of that, which  |
| 14 | means more exports versus dollars in our     |
| 15 | favor. And we're going to see an increase in |
| 16 | exports.                                     |
| 17 | So we just have to associate those           |
| 18 | things that are going to happen with the     |
| 19 | bottlenecks that may be created in our ports |
| 20 | systems.                                     |
| 21 | CHAIR WELCH: Okay. Good.                     |
| 22 | Thanks, Gary.                                |

|    | Page 119                                       |
|----|--|
| 1  | Let's go back to Captain Glang and             |
| 2  | we'll see if any Panel members have some       |
| 3  | further reaction.                              |
| 4  | Go ahead, Gerd.                                |
| 5  | CAPTAIN GLANG: Thank you, Ed.                  |
| б  | Gerd Glang.                                    |
| 7  | So just before the break I thought             |
| 8  | Kennedy made some really good points, also     |
| 9  | responding to Joyce and her questions on the   |
| 10 | budget. So I was going to offer to the Panel,  |
| 11 | maybe, obviously, given the constraints of the |
| 12 | budget, we now understand that growing the     |
| 13 | Navigation Services' budget is going to be     |
| 14 | basically impossible in this climate. So       |
| 15 | maybe that's not what we do. Maybe what the    |
| 16 | Panel instead can offer, and each of you comes |
| 17 | with a very unique perspective on NOAA's       |
| 18 | Navigation Services or NOAA's services,        |
| 19 | broader, but maybe the Panel can support, can  |
| 20 | help us create arguments for preserving the    |
| 21 | budget that we have. Because I think that's    |
| 22 | going to become just as important in           |

|    | Page 120                                       |
|----|--|
| 1  | developing the '12 budget and the '13 budgets. |
| 2  | So the Panel is, I think, with                 |
| 3  | your different perspectives could maybe        |
| 4  | consider how do we make a better argument for  |
| 5  | preserving what we have. And the corollaries   |
| 6  | to that, and you'll see that in this guidance, |
| 7  | where how do we identify more clearly the      |
| 8  | societal values of the navigation services?    |
| 9  | And then related to that also were this notion |
| 10 | of the navigation services and the value they  |
| 11 | provide in the non-traditional sectors. And    |
| 12 | we've got representatives from those non-      |
| 13 | traditional sectors here on the Panel as well. |
| 14 | So maybe there's a little bit of serendipitous |
| 15 | design here in how the Panel is constructed,   |
| 16 | but I think the Panel could make a really good |
| 17 | focus on that: How do we make a better         |
| 18 | argument to the Administrator to preserve the  |
| 19 | budget that we have? It's something that she   |
| 20 | can carry back to the Hill to help argue to at |
| 21 | least maintain the Navigation Services'        |
| 22 | budget. So I'm just going to throw that idea   |

| 1  |   |
|----|---|
|    | Page 121                                      |
| 1  | out there. Think about it a little bit        |
| 2  | differently.                                  |
| 3  | CHAIR WELCH: Yes.                             |
| 4  | MEMBER JAY: David Jay.                        |
| 5  | In response to that, I wonder the             |
| 6  | tragedy of the Japanese tsunami, at least in  |
| 7  | Oregon got a lot of people's attention that   |
| 8  | had never thought about tsunamis at all       |
| 9  | before. I mean, it was sort of a vague,       |
| 10 | distant threat, you know, no reality to it.   |
| 11 | And in terms of tsunami preparedness, the     |
| 12 | services that NOAA NOS provides are extremely |
| 13 | important.                                    |
| 14 | Mapping. If we're going to have               |
| 15 | decent run out predictions, we have to have   |
| 16 | good coastal mapping.                         |
| 17 | Tide gauges. You know, observing              |
| 18 | when tsunamis happen so we can model better.  |
| 19 | All of these things. This is a                |
| 20 | tragedy, obviously, but I wonder if we can    |
| 21 | make use of it a little bit and point out the |
| 22 | importance of Navigational Services in that   |
|    |   |

| Page 122                                       |
|--|
| kind of text as well?                          |
| MEMBER SHINGLEDECKER: I would be               |
| interested in seeing, it seems to me that      |
| marine spatial planning is obviously a key     |
| priority and there are so many facets to that  |
| exercise. And it seems to me that Navigation   |
| Services could easily get lost in the many     |
| layers of marine spatial planning. And it      |
| almost seems like there could be almost like   |
| a campaign for saying that Navigation Services |
| literally is the foundation of any marine      |
| spatial planning and tying it to that broader  |
| framework that definitely seems to have legs   |
| and seems to going places. And, presumably,    |
| there's money going towards that at some       |
| point.   |
| CHAIR WELCH: If I could, let me                |
| make a comment. David Kennedy alluded to       |
| this, and this may be a little bit some of     |
| our NOAA colleagues may flinch when I say      |
| this. But David understated how much           |
| political controversy there is about marine    |
|  |

| 1  |  |
|----|--|
|    | Page 123                                       |
| 1  | spatial planning. There are key members of     |
| 2  | the House of Representatives who have said     |
| 3  | the Chair of the Committee that oversees       |
| 4  | NOAA's ocean programs has said "I'm going to   |
| 5  | put a stop to this marine spatial planning     |
| 6  | nonsense."                                     |
| 7  | Now, it is being perceived in a                |
| 8  | very political way. I don't think it was       |
| 9  | offered in a political way, but there are      |
| 10 | people that are responding to it               |
| 11 | ideologically.                                 |
| 12 | So just because they're opposed to             |
| 13 | it and are making statements like that doesn't |
| 14 | mean it's going to be stopped in its tracks.   |
| 15 | But there is some risks into jumping on to the |
| 16 | marine spatial planning horse. The horse may   |
| 17 | not go so fast. It might die. And so while     |
| 18 | you want to make sure you're onboard that      |
| 19 | horse if it's running around the track, you    |
| 20 | want to have a contingency plan, too. Because  |
| 21 | it may be hobbling around that track.          |
| 22 | And to the extent if your service              |

| 1  |  |
|----|--|
|    | Page 124                                       |
| 1  | is too identified with marine spatial          |
| 2  | planning, you get identified with the baggage  |
| 3  | that it carries as well as the momentum.       |
| 4  | So, I'll just I'm not myself,                  |
| 5  | you know, saying marine spatial planning is a  |
| 6  | bad idea. But there are some key people up on  |
| 7  | Capitol Hill that don't like it one bit. And   |
| 8  | it remains to be seen. And there's some        |
| 9  | industries that don't like it one bit. And it  |
| 10 | remains to be seen whether they're going to be |
| 11 | able to throw significant roadblocks or not in |
| 12 | its way.                                       |
| 13 | Okay. Who had a comment? Let's go              |
| 14 | to Michele.                                    |
| 15 | MEMBER DIONNE: Michele Dionne                  |
| 16 | from the Wells NERR in Maine.                  |
| 17 | Following up on the heightened                 |
| 18 | sort of public awareness from the tsunami,     |
| 19 | well we certainly people's attention to be     |
| 20 | focused on the Gulf oil spill. And one of the  |
| 21 | real sort of limitations to understanding the  |
| 22 | sort of play out of a hazard like that is      |

| Page 125                                       |
|--|
| circulation modeling. It's also very           |
| important for understanding flood hazards and  |
| things. And critical to any good circulation   |
| model is bathymetry. And that's certainly      |
| something that Navigation Services provides    |
| and you don't want to limit it just, so I'm    |
| not talking not just about doing what you need |
| to do within your ports for navigation         |
| purposes. But we really do need I think in     |
| order to prepare our coasts for short          |
| term/long term hazards and response to hazards |
| and predictions is really good coastal         |
| bathymetry, period.                            |
| And I think that we talked a                   |
| little bit about this at the orientation that  |
| maybe just calling it Navigation Services      |
| restricts peoples' sort of willingness to      |
| listen to what Navigation Services has to say  |
| and what they offer.                           |
| We talked a little about it, and I             |
| think it's been discussed before. Navigation   |
| could be navigation and mapping services, or   |
|  |

|    | Page 126                                       |
|----|--|
| 1  | something like that might help. Just get the   |
| 2  | ear of people that need to understand what all |
| 3  | NOAA is doing within this realm.               |
| 4  | CHAIR WELCH: Okay. David?                      |
| 5  | MEMBER JAY: David Jay, Portland                |
| б  | State.   |
| 7  | I'd like to second that. That was              |
| 8  | a really great comment.                        |
| 9  | Dr. Brigham pointed out that only              |
| 10 | six percent of the Arctic, I think it was, has |
| 11 | been properly mapped and yet if you go to      |
| 12 | lower 48 estuaries you have excellent mapping  |
| 13 | in the navigation channel, you know, but you   |
| 14 | got mapping elsewhere that dates back          |
| 15 | sometimes a century and is wildly inaccurate   |
| 16 | and not adequate for circulation modeling or   |
| 17 | inundation modeling, or many purposes. So we   |
| 18 | have major shortfalls in mapping all over the  |
| 19 | lower 48, I'm sure.                            |
| 20 | CHAIR WELCH: Joyce?                            |
| 21 | MEMBER MILLER: Back to the                     |
| 22 | tsunami comment earlier. I think that's a      |
|    |  |

|    | Page 127                                       |
|----|--|
| 1  | great idea, but I believe I heard somewhere in |
| 2  | this budget cycle that at one point somebody   |
| 3  | had zeroed out the Tsunami Warning Center here |
| 4  | in Hawaii. And this was shortly before the     |
| 5  | Japan tsunami. And I don't recall at what      |
| 6  | stage of the budget that was. I think this is  |
| 7  | no longer true. But, I don't know, do any of   |
| 8  | you know anything about that?                  |
| 9  | CHAIR WELCH: There was a                       |
| 10 | situation about a year and a half ago where    |
| 11 | somebody up on Capitol Hill was raising hell   |
| 12 | about volcano-observing funds about two weeks  |
| 13 | before the big volcano off in Alaska. And,     |
| 14 | you know, people have short memories. They     |
| 15 | don't think anything bad is going to happen,   |
| 16 | and then something bad happens and they get    |
| 17 | the religion.                                  |
| 18 | Let me take a minute and I want to             |
| 19 | read to the new Panel members a letter that I  |
| 20 | just got. I'm just going to read a couple of   |
| 21 | selections from it. But this is a very small   |
| 22 | little item that the Panel was involved with,  |

|    | Page 128                                       |
|----|--|
| 1  | but it goes to the point you were making about |
| 2  | how can you get people's attention about what  |
| 3  | these services really do in the real world.    |
| 4  | We had a meeting from Providence,              |
| 5  | Rhode Island about a year ago, a year and a    |
| 6  | half ago. And we had a gentleman that came in  |
| 7  | from far northeastern Maine with the pilots up |
| 8  | there and he said to the Panel, he said "We    |
| 9  | had a situation up there where fishermen, we   |
| 10 | have a lot of commercial fishermen who," he    |
| 11 | said, "frankly like to take risks." They have  |
| 12 | to take risks and they're out there trying to  |
| 13 | compete and catch fish in a tough environment  |
| 14 | and a limited season. And there has just been  |
| 15 | a rash of commercial fishing accidents, mainly |
| 16 | where it appears that they have snagged        |
| 17 | uncharted obstacles. And nobody has charted    |
| 18 | this bay up there because there's not any      |
| 19 | material commercial shipping there. There's    |
| 20 | commercial fishing, but not what you and I     |
| 21 | would consider to be commercial navigation.    |
| 22 | And people are dying and we need some better   |

|    | Page 129                                       |
|----|--|
| 1  | charts.  |
| 2  | And he was emotional and emphatic              |
| 3  | in his presentation, and very effective.       |
| 4  | So one of the things the Panel did             |
| 5  | was that we in our summary letter to Dr.       |
| 6  | Lubchenco said NOAA needs to deviate a little  |
| 7  | bit from its policy of concentrating on the    |
| 8  | area of commercial navigation and see if       |
| 9  | there's something you can do up in this bay    |
| 10 | for the fishermen.                             |
| 11 | And the Panel was not the only                 |
| 12 | entity that was saying the same thing. But     |
| 13 | the Office of Coast Survey was saying the same |
| 14 | thing internally to the NOAA leadership. And   |
| 15 | one of the Maine Senators was saying.          |
| 16 | But here's the letter that we just             |
| 17 | received from our witness. He said to the      |
| 18 | Panel members, he says "Shortly after the      |
| 19 | meeting and within the recommendation that you |
| 20 | made to NOAA within one week, NOAA had people  |
| 21 | from the Navigation Response Team #5 on the    |
| 22 | water in Cobscook Bay working out of East Port |

|    | Page 130                                       |
|----|--|
| 1  | Maine." It turned out to be an amazing survey  |
| 2  | effort which lasted into November 2010, six    |
| 3  | months. And he he named several of the NOAA    |
| 4  | people individually that were part of this     |
| 5  | effort, including Captain Lowell.              |
| б  | He said "Conducted a complete                  |
| 7  | survey of the area, worked very hard with      |
| 8  | public outreach, especially with the fishing   |
| 9  | community, met with the press on an almost     |
| 10 | weekly basis, responded to special requests    |
| 11 | for wreck identification and charting          |
| 12 | successfully located within centimeters        |
| 13 | several missing and dangerous wrecks. The      |
| 14 | information was sent to us in December and the |
| 15 | wrecks identified in February. The tidal       |
| 16 | currents in Cobscook Bay with tidal ranges of  |
| 17 | between minus 3.2 feet to plus 23.9 feet are   |
| 18 | very difficult to work surveys in, but the     |
| 19 | team's expertise and safe boat handling was    |
| 20 | interesting to observe.                        |
| 21 | "NOAA responded quickly,                       |
| 22 | enthusiastically and thoroughly to your        |

| 1  |  |
|----|--|
|    | Page 131                                       |
| 1  | Panel's request. The result was a survey,      |
| 2  | press relations, community outreach and local  |
| 3  | participation is, we are happy to report, the  |
| 4  | loss of no fishermen or vessels during the     |
| 5  | dragging season between October 2010 and April |
| 6  | of 2011." And they were losing one or two      |
| 7  | vessels per year up to that.                   |
| 8  | "We have no doubt that the work of             |
| 9  | the Office of Coast Survey and Navigation      |
| 10 | Response Team #5 both on and off the water was |
| 11 | the primary reason for the dragging season's   |
| 12 | safe outcome. This helped changed for the      |
| 13 | better the safety philosophy of the fishing    |
| 14 | community in our area. We could ask for no     |
| 15 | more."   |
| 16 | This is the type of thing that                 |
| 17 | gets people's attention. You can show this to  |
| 18 | a Senator or a congressman or a governor or an |
| 19 | agency head, and this trumps all the           |
| 20 | statistics in the world about how important    |
| 21 | Navigation Services, bathymetry or that type   |
| 22 | of thing is.                                   |

|    | Page 132                                       |
|----|--|
| 1  | So, I just wanted to bring this to             |
| 2  | the new Panel members' attention. We haven't   |
| 3  | even had a chance to distribute it to the old  |
| 4  | Panel members who just came in.                |
| 5  | And I'd like to say to all the                 |
| 6  | NOAA folks, Captain Lowell and all your folks, |
| 7  | congratulations. This is an excellent          |
| 8  | testimony to the worth of all the federal      |
| 9  | employees.                                     |
| 10 | MEMBER JACOBSEN: Great.                        |
| 11 | CHAIR WELCH: Yes. When a                       |
| 12 | government agency preserves people's lives and |
| 13 | livelihoods, that's the purpose of government. |
| 14 | CAPT. LOWELL: Thank you, Ed.                   |
| 15 | Like I mentioned, a lot of this                |
| 16 | activity is the presentation package. Captain  |
| 17 | Peacock was extremely emotional. He talked     |
| 18 | about the 15 deaths that had occurred there    |
| 19 | over the last few years both in the community  |
| 20 | and in U.S. waters. And that was the focus.    |
| 21 | And although it was on our schedule, it was    |
| 22 | certainly you know myself sitting there        |

Page 133

listening to Captain Peacock talk about the
 issues just kind of raised the priority, so we
 did respond.

And the new Panel 4 CHAIR WELCH: 5 members, you will see that we've got sprinkled 6 throughout the program over the next three 7 days we have several what we call stakeholder 8 panels, which are people both in and outside 9 of government that use some of these products of Navigation Services. And we on the Panel 10 have found these to be great things because 11 12 they give us feedback, we learn things that we didn't expect to hear. We've learned how 13 14 highway road crews for the State of Minnesota used NOAA Navigation Services to plow the snow 15 on highways in Minnesota. You know, I didn't 16 17 expect to hear something like that. We learned how the Domino Sugar 18 19 Company, which is the biggest sugar importer

20 on the East Coast of the U.S. in Baltimore 21 Harbor can save millions of dollars a year or 22 lose billions of dollars a year by shutting

Page 134

1 down or not shutting down based on NOAA's 2 water level predictions. And if they shutdown 3 too early, they lose a lot of money. And if 4 they shutdown too late, they suffer a lot of 5 damage.

So, you know, we didn't expect to 6 7 hear Domino Sugar say that they have been fans 8 of NOAA Navigation Services. And I'm not 9 going to say that everyone of the panelist 10 coming in over the next three days are going to have dramatic statements like that, but you 11 12 just can't anticipate when one of these panelists is really going to sort of make you 13 14 think and give you some information that you 15 didn't expect to hear that the Agency needed 16 to hear, and that the people that make decisions about how the Agency should be 17 funded need to know about too. 18 19 So we will continued, even as we 20 have these strategic thinking sessions, to try 21 to incorporate opportunities for private 22 sector and public folks, users, traditional

|    | Page 135                                       |
|----|--|
| 1  | users and non-traditional users to come in and |
| 2  | make their observations.                       |
| 3  | Sherri?  |
| 4  | MEMBER HICKMAN: Yes, Sherri                    |
| 5  | Hickman, Houston Pilots.                       |
| 6  | And I agree. I mean, that's great              |
| 7  | this letter you just read to us because        |
| 8  | Captain Peacock was emotional. But we've also  |
| 9  | done other things.                             |
| 10 | When we had our meeting in Florida             |
| 11 | we found out that they depicted a spot that    |
| 12 | they anchor ships, and the ships were          |
| 13 | anchoring in coral reef. So they're required   |
| 14 | to go there. And so I think we helped along    |
| 15 | with that as well. And that's great.           |
| 16 | But I don't know that I bet you                |
| 17 | if we went to every state and had a meeting,   |
| 18 | we could help with something. And I'm not so   |
| 19 | sure that that's really what the Panel was     |
| 20 | for. Because I'm pretty sure if we looked      |
| 21 | back at our most wanted that most of that has  |
| 22 | not been really looked at nothing majorly done |

| Page 136                                       |
|--|
| with that. And it's kind of disheartening.     |
| So, like, here we have a budget to             |
| build a new NOAA vessel. I don't even know if  |
| it's running yet, is it?                       |
| CAPT. LOWELL: You talking                      |
| Hassler?                                       |
| MEMBER HICKMAN: Yes.                           |
| CAPT. LOWELL: No.                              |
| MEMBER HICKMAN: And yet we                     |
| decommissioned one, and we don't even have the |
| budget to crew the new one if it was running,  |
| because the crew on the other vessel was       |
| smaller. And that just seems mind-boggling to  |
| me that this wasn't a forethought or a         |
| foresight. Of course, if the budget was going  |
| to be there, it seems horrible that this boat  |
| is not even running with a crew to do          |
| surveying.                                     |
| So I think our picture here is                 |
| probably bigger. Yes, the local things that    |
| we can help with are great. But I bet you that |
| we could do that every time we have a meeting  |
|  |

Page 137 1 somewhere. 2 CHAIR WELCH: And we could. And 3 the purpose of the Panel is not to be an 4 ombudsman, you know, problem-solving. But my 5 point is, if we hear from people like this, we 6 the Panelist get some --7 MEMBER HICKMAN: Recognition. 8 CHAIR WELCH: -- picture of what 9 users think about how well or poorly NOAA may 10 be doing. And I remember Ronald Reagan's 11 12 President Reagan's, his closest staff. They said they could go in there and make 13 14 presentations on policy issues and big picture stuff, charts, and after a short while his 15 eyes would glaze over. But if somebody went 16 in and said, you know, "This is effecting Mrs. 17 18 Smith in this particular way and it's this 19 program that is going to make a difference," 20 he'd get engaged. And so many of our leaders 21 are like that. 22 So you need some concrete examples

|    | Page 138                                       |
|----|--|
| 1  | to give, I think, some heart to what you're    |
| 2  | talking about. You shouldn't have to, you      |
| 3  | know. But in our effort to try to promote the  |
| 4  | big things, Sherri, I think it's useful to     |
| 5  | have, a few of these examples.                 |
| 6  | You know, our purpose is not here              |
| 7  | really to solve these types of problems. But   |
| 8  | we need to know about these little types of    |
| 9  | incidents so that we can use them to promote   |
| 10 | our big picture agenda.                        |
| 11 | Yes, Lawson?                                   |
| 12 | MEMBER BRIGHAM: Yes. Lawson                    |
| 13 | Brigham from Alaska.                           |
| 14 | Yes, I agree with Michele that we              |
| 15 | need it would be useful at sometime in the     |
| 16 | next couple of years to actually have our      |
| 17 | definition of national navigational services   |
| 18 | our the Panel members with the assistance      |
| 19 | of the NOAA people. But I think sometimes from |
| 20 | government, when I was in the Coast Guard, we  |
| 21 | get a bureaucratic definition of something     |
| 22 | when it really didn't fit what the public      |

Page 139 thinks it is in the broadest of context. 1 And 2 it would be nice to have a little facilitated discussion amongst us to see how close or how 3 different our view of navigational services is 4 5 to what the bureaucratic view is. And I don't mean that in the negative sense. 6 So it might 7 be useful. 8 The thing you brought up in your 9 points about the role of technology, I'm 10 getting a sense on the Hill and particularly when I deal with DHS people, that technology 11 12 will eliminate the need for ships in the nation's inventory. And I don't buy it. 13 I, 14 of course, work on icebreaker issues. And 15 people are starting to say "Ah, satellites can do it all or autonomous vehicles can do it 16 17 all." You know, I absolutely don't buy it for 18 the next century. 19 So in the terms of hydrography and 20 ships for the NOAA fleet, I think we're up 21 against a new phenomena, which is all the high 22 tech stuff can eliminate the need for ships,

|    | Page 140                                       |
|----|--|
| 1  | except for maybe gray ships, or we outsource   |
| 2  | to foreign countries or we do all kinds of     |
| 3  | novel things.                                  |
| 4  | So I think it is an issue. And I               |
| 5  | think people are going to argue that, "Ah,     |
| 6  | satellites can do everything or autonomous     |
| 7  | vehicles," and I think we need to either make  |
| 8  | the case or not make the case that some small  |
| 9  | body of a fleet of ships is necessary to carry |
| 10 | out science and research on the scene with     |
| 11 | humans actually doing it to at least correlate |
| 12 | with all the satellites' information.          |
| 13 | A comment about marine spatial                 |
| 14 | planning in Alaska and integrated use. It      |
| 15 | isn't necessarily about the commercial world,  |
| 16 | there's barge traffic, there are large ships   |
| 17 | into the Red Dog Mine, but most of it is about |
| 18 | fishing vessels and offshore development and   |
| 19 | what that means. So it isn't traditional, in   |
| 20 | a sense.                                       |
| 21 | And it's also about indigenous                 |
| 22 | use. And so there integrating in the U.S.      |

|    | Page 141                                      |
|----|---|
| 1  | Arctic, it's about almost everything but      |
| 2  | global transport. Although some people think  |
| 3  | it is, I'll have to try to dispel that        |
| 4  | tomorrow. So I think marine spatial planning, |
| 5  | multiple use management is important there,   |
| 6  | and Navigation Service is hugely important to |
| 7  | all of these other sectors, which we don't    |
| 8  | necessarily think about. But fisheries, of    |
| 9  | course, is huge there, as you all know.       |
| 10 | Anyway, a couple of comments.                 |
| 11 | CHAIR WELCH: Joyce?                           |
| 12 | MEMBER MILLER: Joyce Miller                   |
| 13 | again,  |
| 14 | One thing, as I said, I work                  |
| 15 | pretty closely with NOAA and the entire       |
| 16 | process of loss in statement or discussion of |
| 17 | ships being important well I'm a surveyor     |
| 18 | in small launches and multi-beam ships,       |
| 19 | obviously, I think they're important but I    |
| 20 | think one of the things that possibly the     |
| 21 | Panel could make a recommendation on is       |
| 22 | efficient use of ships. Because this year     |

Page 142 1 there's been discussion of are we laying up 2 one, two, three, four, five ships, are we going to have 135 days per ship, are we going 3 4 to -- I mean, everything's been on the table. 5 And I just think that if you got ships and you've got crews, having them sit around while 6 7 the greater NOAA makes some sort of decision 8 of what's going to happen, that's a shameful 9 waste of resources. I mean, it's just -- it's 10 wasteful to have these ships with a full crew on them waiting to go out and having to wait 11 12 to know whether you've got 136 days or -- I mean, ships used to have what? 13 210 days of 14 sea time. This year, some of them are down to 15 130. 16 And it just seems like that might 17 be a suggestion that the Panel might be able 18 make. 19 I was hoping that the guy from 20 Maersk would be here and have somebody from 21 NOAA explain how the ship allocation is --22 somebody who runs big commercial ships would

|    | Page 143                                       |
|----|--|
| 1  | just be appalled at what that takes out of the |
| 2  | ability to do surveying, really. Not just for  |
| 3  | Navigation Services but for programs and so    |
| 4  | forth.   |
| 5  | So, I don't know if anybody else               |
| 6  | has experience with that.                      |
| 7  | CHAIR WELCH: Okay. Gerd, you                   |
| 8  | were going to say something?                   |
| 9  | CAPTAIN GLANG: Gerd Glang.                     |
| 10 | Yes. I should probably talk to you             |
| 11 | afterwards, Joyce. I have experience with the  |
| 12 | ship allocation process because we're a        |
| 13 | witness to it and we try to keep Kennedy       |
| 14 | involved with it or aware of what's going on.  |
| 15 | It could be a long conversation.               |
| 16 | But the same issues that we deal               |
| 17 | within the Ocean Service as far as the budget  |
| 18 | and the appropriation cycle, that affects the  |
| 19 | fleet just as much where it's tied closely to  |
| 20 | planning for science missions and then there's |
| 21 | a delay in the appropriations and you have to  |
| 22 | make certain assumptions. And that's how we    |

Page 144 1 wind up with these resources that are under-2 utilized. 3 So I think that I like your 4 suggestion, though, and maybe we can put that 5 on our list of things to consider for the Panel to focus on is how we might improve 6 7 efficiency of the NOAA fleet, because that's 8 sort of the purview we have. But that also echoes what in the National Ocean Policy we 9 10 have these strategic action plan writing teams for each of those nine priority objectives. 11 12 And the ninth one, Observations, Mapping and Infrastructure, each of these strategic action 13 14 plans will have six actions. And that ninth priority objective, one of those six actions 15 has to deal with improving the efficiency or 16 the utilization of the federal fleet. 17 It's 18 the National Oceanographic Fleet or Federal 19 Oceanographic Fleet, of which NOAA is part of. 20 So there's a nice echo there. So that could 21 be the narrow enough theme that the Panel 22 could maybe invest a little time and
|    | Page 145                                       |
|----|--|
| 1  | understanding and come away with some crisp    |
| 2  | recommendations to the Administrator.          |
| 3  | CHAIR WELCH: Okay. Yes?                        |
| 4  | MEMBER SHINGLEDECKER: Just kind                |
| 5  | of back to a little bit what I said before     |
| 6  | with targeting what we're looking at and our   |
| 7  | priorities and our needs and marine spatial    |
| 8  | planning. I guess I could have said that more  |
| 9  | broadly.                                       |
| 10 | If it's the National Ocean                     |
| 11 | Policy's strategic action plans, it seems      |
| 12 | maybe looking at I mean Sherri alluded         |
| 13 | there's this great document that the Panel has |
| 14 | done in the past of the ten most needed        |
| 15 | improvements. How do we take that and          |
| 16 | structure that in a way that it mirrors a      |
| 17 | vehicle that's moving forward such as those    |
| 18 | strategic action plans? It's not really sexy   |
| 19 | and exciting, but if it would maybe move some  |
| 20 | of these things into actually being            |
| 21 | implemented, including what you were saying,   |
| 22 | Joyce, about the use of the federal fleet,     |

|    | Page 146                                       |
|----|--|
| 1  | that would seem worthwhile to me               |
| 2  | CHAIR WELCH: Okay. Yes, David?                 |
| 3  | MEMBER JAY: Well, being new on                 |
| 4  | this Panel, I guess I feel I have ignorance to |
| 5  | plead so that I can be rash and bring up new   |
| 6  | ideas.   |
| 7  | CHAIR WELCH: Yes.                              |
| 8  | MEMBER JAY: In a time of                       |
| 9  | contracting budgets, I want to mention a       |
| 10 | couple of small but different directions that  |
| 11 | are not much emphasized in previous documents. |
| 12 | And they're both based off the idea that NOS   |
| 13 | or its predecessor organization have almost a  |
| 14 | century of innovation to look back on and be   |
| 15 | proud of. So the United States invented the    |
| 16 | idea that because we have this very long       |
| 17 | coastline in the 1840s and 1850s and almost no |
| 18 | people on it that it was a government          |
| 19 | responsibility to chart it and do the tides    |
| 20 | observations rather than just leaving it to    |
| 21 | the local pilots and sort of thing. So we      |
| 22 | have, perhaps, the best in the world, despite  |

|    | Page 147                                      |
|----|---|
| 1  | our small population, historic tide record.   |
| 2  | Now that gets me to point #1.                 |
| 3  | Even though we did a very good job of         |
| 4  | collecting data, and if we were going to take |
| 5  | sea level rise seriously and changing tides   |
| 6  | and things, we need to resurrect that 19th    |
| 7  | century data. We actually have a rather poor  |
| 8  | record compared to the Europeans of getting   |
| 9  | you know our historic data are sitting on the |
| 10 | archives. They are not available on the CO-   |
| 11 | OPS website.                                  |
| 12 | If you go back you know, a                    |
| 13 | colleague of mine I think came up with a list |
| 14 | of 264 station years of Alaskan tide data     |
| 15 | alone between 1880 and 1940 that are not on   |
| 16 | the CO-OPS website. And Steve Gill told him   |
| 17 | "Well, we started on this project a few years |
| 18 | ago and we just didn't have the funding. We   |
| 19 | lost funding for it so it sat. And so that's  |
| 20 | one area.                                     |
| 21 | Another is, you know, one of the              |
| 22 | reasons the U.S. Archives hold the best       |

|    | Page 148                                       |
|----|--|
| 1  | collection of world tide data, historic world  |
| 2  | tide data, is that the tide gauge, there were  |
| 3  | only two tide predicting machines in the world |
| 4  | of circa 1900, one of them in London and one   |
| 5  | in Washington. And so we did tide predictions  |
| 6  | for much of the world at that time. And so we  |
| 7  | have all this data sitting in our archives.    |
| 8  | But there's a need to innovate and             |
| 9  | keep up with where science is on tides.        |
| 10 | The traditional thinking about                 |
| 11 | tides is, very briefly, is that this a         |
| 12 | stationary phenomena, statistically            |
| 13 | stationary. And what oceanographers are        |
| 14 | realizing is that a lot of the information     |
| 15 | that we get out of it and can use is by        |
| 16 | treating it as actually non-stationary.        |
| 17 | And so, tide predictions in the                |
| 18 | Columbia River, NOAA does them but nobody pays |
| 19 | attention to them, the load maxes. I'm sure    |
| 20 | you heard about this in Portland. The load max |
| 21 | is partly done by NOAA, but not NOS. It's run  |
| 22 | by the port and by the National Weather        |

|    | Page 149                                       |
|----|--|
| 1  | Service. And that's partly it's an             |
| 2  | innovation problem in tidal prediction, and    |
| 3  | that's a particularly difficult one. But       |
| 4  | there are lots of difficult harbors across the |
| 5  | United States that need attention.             |
| 6  | New York Harbor, for example.                  |
| 7  | Predictions for New York Harbor are rather     |
| 8  | poor because of ice, once you get above New    |
| 9  | York City.                                     |
| 10 | So there's a need for innovation               |
| 11 | and just analysis and prediction where we      |
| 12 | could actually be doing there is the           |
| 13 | knowledge out there to do much better then is  |
| 14 | currently being done.                          |
| 15 | It's not a huge expenditure, but               |
| 16 | it certainly would have some utility.          |
| 17 | CHAIR WELCH: Okay. Other                       |
| 18 | comments or suggestions?                       |
| 19 | MEMBER HICKMAN: Sherri Hickman.                |
| 20 | Way back when we started this                  |
| 21 | Panel, I know one of the things we brought up  |
| 22 | was user fees for and it kept going round,     |

|    | Page 150                                       |
|----|--|
| 1  | and round and round. But I'm going to bring    |
| 2  | it up again; we'll kick a dead horse, since    |
| 3  | that other horse might die anyway.             |
| 4  | Like when RUDE, for those of you               |
| 5  | who don't know is a NOAA vessel, survey        |
| 6  | vessel, when the RUDE is taken off task, two   |
| 7  | major times it was taken off task; JFK's       |
| 8  | Junior's plane went down. Somebody correct me  |
| 9  | if I'm wrong on that. And also the Bow         |
| 10 | Mariner when she blew up sunk en route from    |
| 11 | New York to Texas. RUDE was taken off task to  |
| 12 | do this, and nobody's charged because the      |
| 13 | government's doing that for free with our tax  |
| 14 | money. Yet, foreign lawyers for the Bow        |
| 15 | Mariner collect that information and get it    |
| 16 | for free, and they're charging big bucks to be |
| 17 | the lawyers for that company. We give it to    |
| 18 | them for free.                                 |
| 19 | RUDE's off task. I don't think                 |
| 20 | anybody was charged to have the Rude off task  |
| 21 | and do that, collect that information for      |
| 22 | either incident. I could be wrong. I don't     |

|    | Page 151                                       |
|----|--|
| 1  | think they were. The money is just because it  |
| 2  | was in the budget or we had to change money.   |
| 3  | The RUDE is off task and not surveying to do   |
| 4  | that.  |
| 5  | And I'm sure there's other areas               |
| б  | where this has occurred, not just the two      |
| 7  | incidents that I'm aware of. And we go round   |
| 8  | and round about if it's always a financial     |
| 9  | budget matter, why can't we figure out how to  |
| 10 | be charging for this when the Coast Guard does |
| 11 | it when they rescue people. They charge.       |
| 12 | So I don't know if that's a new                |
| 13 | area or an old area that we need to reopen and |
| 14 | look at. I don't know if it's feasible.        |
| 15 | MEMBER PERKINS: Mr. Chairman, can              |
| 16 | I chime in on that?                            |
| 17 | CHAIR WELCH: Yes, Scott.                       |
| 18 | MEMBER PERKINS: Scott Perkins                  |
| 19 | with Wilson & Company.                         |
| 20 | The subject of geospatial user                 |
| 21 | fees has come up in other advocacy groups that |
| 22 | I'm involved with. And the fee for service,    |

|    | Page 152                                       |
|----|--|
| 1  | fee for rescue model may not be the best, but  |
| 2  | there are other successful user fee models     |
| 3  | that have been very successful. If you look    |
| 4  | at what as gone on with wildlife restoration   |
| 5  | and the use of a federal duck stamp, for       |
| 6  | example.                                       |
| 7  | If you look at the use of the                  |
| 8  | federal gas tax and how that has created a     |
| 9  | sustainable pool of funding for transportation |
| 10 | infrastructure-related activity.               |
| 11 | And then looking at the                        |
| 12 | opportunity for a geospatial user tax or a     |
| 13 | Navigation Services tax, you know this is a    |
| 14 | location-based services is a looming segment   |
| 15 | of our economy, right? Spatially enabled       |
| 16 | devices are being sold by the millions every   |
| 17 | month. So perhaps a recommendation from this   |
| 18 | panel because Navigation Services is the life  |
| 19 | blood of what the people in this room are here |
| 20 | for, right? Maybe the opportunity is they to   |
| 21 | start advocating for some sort of location-    |
| 22 | based geospatial-based user fee at point of    |

|    | Page 153                                       |
|----|--|
| 1  | purchase on these devices that would generate  |
| 2  | one-hundredth of a cent per unit on the        |
| 3  | commercial side would solve everything that    |
| 4  | we've whined about all morning on the funding. |
| 5  | CHAIR WELCH: That's a very                     |
| 6  | interesting observation, Scott. I'm familiar,  |
| 7  | for example, with there are certain types of   |
| 8  | very small taxes on ammunition, a hunting tax. |
| 9  | Ammunition, bows and arrows, and other even    |
| 10 | fishing tackleboxes.                           |
| 11 | MEMBER DIONNE: Recreational                    |
| 12 | fishing taxes.                                 |
| 13 | CHAIR WELCH: And those users, for              |
| 14 | the most part                                  |
| 15 | MEMBER PERKINS: Are glad to pay.               |
| 16 | CHAIR WELCH: have embraced the                 |
| 17 | idea. Now, you have to be pretty darn sure the |
| 18 | money you're collecting is actually going to   |
| 19 | be spent on the alleged purpose. Because if    |
| 20 | you don't, then you have a situation like the  |
| 21 | Harbor Maintenance Tax. And, in fact, a        |
| 22 | couple of those fishing programs got enacted   |

| -  | Page 154                                       |
|----|--|
| 1  | back in the long dark days before now where    |
| 2  | the money flows automatically without an       |
| 3  | appropriation by Congress. So in other words,  |
| 4  | Congress doesn't have to appropriate the       |
| 5  | money, the money goes into a true trust fund,  |
| 6  | and it is expended. The days of creating       |
| 7  | those automatic appropriations are long gone.  |
| 8  | But it's an interesting concept.               |
| 9  | Matt, did you have a comment?                  |
| 10 | VICE CHAIR WELLSLAGER: I did.                  |
| 11 | Matt Wellslager, South Carolina Geodetic       |
| 12 | Survey.  |
| 13 | Sherri, I agree with you a 100                 |
| 14 | percent. Taking it from the state's            |
| 15 | perspective, we have had to reinvent the wheel |
| 16 | for the services that we provide. And nothing  |
| 17 | is free anymore.                               |
| 18 | My office can no longer provide to             |
| 19 | farmers, to the counties, to anybody that uses |
| 20 | geospatial data anything for free. We have to  |
| 21 | prove our existence or fund for our existence, |
| 22 | and I think when the situation like the RUDE   |

Page 155 1 being taken off line is moving its priorities 2 from one situation to another, that service needs to be subsidized. And how it gets 3 subsidized is going to be a question that we 4 5 can't actually answer here but needs to be addressed. 6 7 And NOAA, NOS, Coastal Geodetic 8 Services; somebody is going to have to, I 9 guess, step up to the plate and say these are 10 the things that we need. It's got the idea of taxes, I'm behind 100 percent. Being a public 11 12 official, getting that to float is going to be damn near next to impossible. 13 14 You know, this new no tax thing. Well, how in the hell are we paying for things 15 if we can't tax something. And I have a hard 16 time with that, but I really think we need to 17 18 -- and wordsmithing it is 90 percent of the 19 battle. Making it work and having someone 20 that can come up with a way to phrase is 21 correctly would be the way to do that. But we need to charge if we're 22

|    | Page 156                                       |
|----|--|
| 1  | working on something and we're taken off task. |
| 2  | When we're taken off task, somebody has to     |
| 3  | step up and pay that bill. And how we're       |
| 4  | going to get that done, I don't know. But      |
| 5  | it's losing money because we're not keeping    |
| 6  | the focus of what we're trying to do there     |
| 7  | It's broadening the scope, and we got to kind  |
| 8  | of tie that scope back.                        |
| 9  | Good idea, though.                             |
| 10 | MEMBER MILLER: Joyce Miller.                   |
| 11 | I have a question. Has NOAA                    |
| 12 | gotten anything back from BP oil spill? I      |
| 13 | mean, there were numerous ships, numerous      |
| 14 | scientists. I mean, half of NOAA was down      |
| 15 | there for a time. And has any of it flown      |
| 16 | back into                                      |
| 17 | MR. KENNEDY: Yes. All of the                   |
| 18 | vessels that were down there working on the    |
| 19 | oil spill and the ones that continue, are, in  |
| 20 | fact, reimbursed. And that's the good news.    |
| 21 | The bad news, though, and it does not get to   |
| 22 | a sustainable solution, is all of those ships  |

|    | Page 157                                       |
|----|--|
| 1  | had missions.                                  |
| 2  | MEMBER MILLER: Yes.                            |
| 3  | MR. KENNEDY: They didn't do any                |
| 4  | of those missions. Okay. They got money, but   |
| 5  | they're the same ships that now have a year of |
| 6  | lost mission that have to go back and figure   |
| 7  | out how to do it again; do their mission that  |
| 8  | they didn't do last year this year, and        |
| 9  | essentially it's a zero-sum game only it's     |
| 10 | less then that because those funds that are    |
| 11 | reimbursed well, it's a long, sad story.       |
| 12 | But, nonetheless we did get reimbursed. But    |
| 13 | part of the dilemma is that we didn't do the   |
| 14 | mission we're supposed to be doing. We got     |
| 15 | money, but we're in no better shape to do the  |
| 16 | mission with that money. It just offsets some  |
| 17 | of the other problems we had.                  |
| 18 | So the idea of some sustainable                |
| 19 | way to pay for our services beyond just        |
| 20 | reimbursable in an incidental fashion, I       |
| 21 | think, is a much better approach in my mind.   |
| 22 | CHAIR WELCH: David, does the                   |

|    | Page 158                                      |
|----|---|
| 1  | Agency have a history or a catalog over a     |
| 2  | period of time of showing how much and how    |
| 3  | frequently assets have been taken off their   |
| 4  | normal mission to respond to some kind of     |
| 5  | unexpected event?                             |
| 6  | In other words, is there a way of             |
| 7  | saying 20 percent of the time we aren't doing |
| 8  | what we consider to be our normal mission, or |
| 9  | part of it. Do you see what I' saying?        |
| 10 | MR. KENNEDY: No, I do see what                |
| 11 | you're saying. That maybe, Captain Lowell?    |
| 12 | CAPT. LOWELL:                                 |
| 13 | John Lowell.                                  |
| 14 | Let me just bring up two quick                |
| 15 | points.                                       |
| 16 | I think data is available for that            |
| 17 | kind of an analysis. Nobody's certainly asked |
| 18 | me for that, but that's reasonable that       |
| 19 | someone can look into.                        |
| 20 | CHAIR WELCH: Would that be a                  |
| 21 | useful thing to have?                         |
| 22 | CAPT. LOWELL: I would say it                  |

| Page 159                                       |
|--|
| would certainly allow everyone to understand   |
| the magnitude of the issue, which is kind of   |
| Sherri's point.                                |
| But #2 is, you know one of the                 |
| reasons for our existence is for hazard        |
| response.                                      |
| CHAIR WELCH: Right.                            |
| CAPT. LOWELL: And to have that                 |
| number might validate it. Say, it comes out    |
| to 15 percent. I'm making this up. At 15       |
| percent, as historically we expend sources of  |
| 15 percent for these activities, then it would |
| be reasonable to assume that should we not     |
| exceed that 15 percent, we are on mission at   |
| that point. We're not deviating from mission.  |
| So hazard response currently is part of our    |
| responsibility in the things we do. We would   |
| deviate it to NRTs, and I think I'll mention   |
| that this afternoon to deal with tsunami       |
| issues in California this year. But we         |
| consider that part of our normal routine       |
| business. So the fact that we would defer a    |
|  |

|    | Page 160                                       |
|----|--|
| 1  | ship to go, you know Bow Mariner, we'll call   |
| 2  | that incident, I wouldn't say we were off task |
| 3  | at that point, but we were still within our    |
| 4  | mission envelop.                               |
| 5  | CHAIR WELCH: Gary?                             |
| 6  | MEMBER JEFFRESS: Just a question               |
| 7  | to Dave and John.                              |
| 8  | I guess that compensation from BP              |
| 9  | also included the coastal mapping and your     |
| 10 | time, Dave, when you went down there, et       |
| 11 | cetera. But then how do you cost that out?     |
| 12 | How did you come up with a number for that?    |
| 13 | MR. KENNEDY: Well, it wouldn't be              |
| 14 | a number that would stack up if you had to go  |
| 15 | out and get that in the commercial sector,     |
| 16 | that's for sure. The vessel has kind of a      |
| 17 | calculated per day cost, and that's what was   |
| 18 | used for all of the vessels that were down     |
| 19 | there. And labor was just straight labor; you  |
| 20 | know whatever we were being paid, and that     |
| 21 | wasn't everybody. And I'm not one of them      |
| 22 | that did get paid. I got to spend most of my   |

| Pa  | age 161 |
|---|---------|
|   | -90 ±0± |
| 1 time just being a conductor of the orchestra  | a.      |
| 2 But it's just straight labor costs and then   |         |
| 3 whatever our routine ship costs are per day   |         |
| 4 that were charged.                            |         |
| 5 CHAIR WELCH: Yes, Jeff?                       |         |
| 6 MEMBER CAROTHERS: Yes, this Je                | Ef      |
| 7 Carothers.                                    |         |
| 8 I'm a little bit confused on what             | at      |
| 9 George was talking about, you know on the     |         |
| 10 waste of resources with the ships down to 12 | 30      |
| 11 days a year or something like that. It see   | ns      |
| 12 to me like they're off mission most of the   |         |
| 13 time if there's 200 days they're not out     |         |
| 14 surveying and if they are down, it seems to  | me      |
| 15 like a BP thing is a good thing if they're a | not     |
| 16 being used. Now maybe I'm confused on that   | •       |
| 17 The other issue I'd like to brin             | ng      |
| 18 out is another option is, you know if the    |         |
| 19 boats are really down that much time, why d  | id      |
| 20 they sit in port? You know, other uses for   |         |
| 21 them. I'm looking for a survey boat that I   | ' m     |
| 22 having a hard time locating one. I mean,     |         |

Page 162 would that be an option at some point to make 1 2 NOAA vessels available to commercial markets? 3 MR. KENNEDY: That's interesting. 4 You guys ought to try and answer that one. 5 It's more down your --MEMBER CAROTHERS: Maybe too much 6 7 red tape, but there may be a need there. 8 MR. KENNEDY: Yes. 9 CAPT. LOWELL: Yes, there might 10 actually be some laws that would frown on 11 that. 12 MR. KENNEDY: Yes. 13 CAPT. LOWELL: Putting federal 14 vessel in some competitive mode to use. 15 MR. KENNEDY: Well, yes. Well, if I could 16 CHAIR WELCH: 17 just make a couple of comments about down time of NOAA vessels. 18 19 Part of it is this need for 20 advanced scheduling and advanced planning. 21 And then if Congress doesn't provide the money 22 that fits in with the advance scheduling,

Page 163 1 those schedules have to be juggled. And 2 sometimes you lose the opportunity to do 3 actually what you were planning to do. You 4 know if you don't get the money soon enough, 5 you can't send a vessel out on a long distant journey and mission as you were planning. 6 You 7 just don't have that much time or the vessel 8 doesn't have time to get there and get back, 9 or the season is not right. So some of that 10 is not the Agency's fault. They're at the mercy of other people providing the funds. 11 12 Also, they make projections in their budgets about fuel. And, you know if 13 14 they have X amount of money for fuel and the price of fuel has gone up so much, they're 15 16 going to have to cut back on their projected days of service, unless somebody gives them 17 18 more money for that fuel. 19 So there are a number of reasons, 20 some a little bit beyond the Agency's control, 21 as to pushing down that days of service per 22 That doesn't explain everything, but asset.

| Page 164                                       |
|--|
| it is a problem and I know they get frustrated |
| with it.                                       |
| MEMBER HICKMAN: I had another                  |
| comment. Sherri Hickman again.                 |
| I did receive an email from a                  |
| previous Panel member that is also a pilot.    |
| I don't think it matters if I mention his      |
| name, but it's Capt. McGovern. And the issue   |
| they're dealing with right now is the right    |
| whales. They have areas on the East Coast      |
| that have to be whose phone was that?          |
| CHAIR WELCH: That's my phone. I                |
| think there ought to be \$25 fine for a cell   |
| phone off that goes right into the Navigation  |
| Services                                       |
| MEMBER HICKMAN: Where does the                 |
| money go?                                      |
| But Andrew is trying to get                    |
| they don't even have that I guess it's         |
| considered a seasonal managed area. So they're |
| not marked on the charts. They're trying to    |
| get them on the ENCs, which with the ECDIS     |
|  |

|    | Page 165                                       |
|----|--|
| 1  | requirement carriage you would think that      |
| 2  | would be an optimal way of accomplishing this. |
| 3  | Yet, he got word that we don't put SMAs on the |
| 4  | chart.   |
| 5  | And they're imposing fines now.                |
| 6  | I'm not even sure who imposes fines. Is that   |
| 7  | NOAA?  |
| 8  | CHAIR WELCH: It's NOAA.                        |
| 9  | MEMBER HICKMAN: So where does                  |
| 10 | that money go? And is it being collected?      |
| 11 | Because in a totally different email that I    |
| 12 | probably don't even have a copy of anymore,    |
| 13 | but I saw that one vessel has been fined three |
| 14 | times with the same captain onboard. They      |
| 15 | haven't paid the fee.                          |
| 16 | I mean, normally if we had a fee               |
| 17 | and they didn't the fine or the fee for our    |
| 18 | services, we'd have them held. We would have   |
| 19 | the vessel detained in port until they pay.    |
| 20 | Now I'm sure our government is going to say    |
| 21 | well we can't do that, it's a foreign ship,    |
| 22 | whatever, there's going to be some red tape.   |

|    | Page 166                                       |
|----|--|
| 1  | But if they're getting fined and they're not   |
| 2  | paying it, what's the sense of having it?      |
| 3  | In the long run, it's not the fine             |
| 4  | that we want. We want compliance with the      |
| 5  | rules so we're not killing the whales to       |
| б  | reduce speed. So that's something that we      |
| 7  | probably want to look at, too, at a local      |
| 8  | level just like we did with Florida and Maine. |
| 9  | But again, it seems like here's another        |
| 10 | situation where it should be on a chart even   |
| 11 | if it's on the electronic chart, so that they  |
| 12 | can comply with the law. And if they're not    |
| 13 | complying, why aren't they paying the money    |
| 14 | and why isn't the ship arrested at the dock if |
| 15 | they haven't paid the fine?                    |
| 16 | CHAIR WELCH: And, Sherri, that                 |
| 17 | would fit in with something that Gary put in   |
| 18 | his document about what we discussed I guess   |
| 19 | at the Portland meeting, which is what they    |
| 20 | call the Chart of the Future which would be    |
| 21 | when you do the electronic charts, how can you |
| 22 | put in some ways temporary information, which  |

Page 167 is what these seasonal zones are, into current 1 2 charts that the mariner can use at the time of 3 those special conditions. So that would fit 4 right in to some of the strategic planning 5 document that we're talking about. MEMBER HICKMAN: Even if we didn't 6 7 have the ability to turn that seasonable part 8 on or off, it could be noted that this is the 9 season, just like it would be on a paper chart for the mariner. 10 11 CHAIR WELCH: Sure. 12 MEMBER HICKMAN: But, again, I think that's something that seems foolish that 13 14 it's not being implemented on an electronic chart so that the fines can be collected if 15 16 they don't comply. 17 CHAIR WELCH: Michele? I'm not sure if 18 MEMBER DIONNE: 19 this hasn't already been done, but talking 20 about talking about loss opportunities with 21 down time because of budget issues and such, 22 I'm assuming NOAA has a group of economists

|    | Page 168                                       |
|----|--|
| 1  | that sort of determine what the value of       |
| 2  | something like charting a coastline or a port  |
| 3  | would be. And perhaps, you know if it hasn't   |
| 4  | already been done, the Navigation Services     |
| 5  | group could make use of figures that indicated |
| 6  | for this much investment, one day of boat time |
| 7  | with a NOAA ship will bring X number of        |
| 8  | dollars in value to our economy, something     |
| 9  | like that. And if you don't use it and it's    |
| 10 | sitting in the port, then you're losing that   |
| 11 | value.   |
| 12 | MEMBER PERKINS: Scott Perkins.                 |
| 13 | I mean, that makes a good point.               |
| 14 | The return on investment argument is important |
| 15 | in all business decisions, but there's a       |
| 16 | finite amount of money available to pay for    |
| 17 | services right now.                            |
| 18 | MEMBER DIONNE: Right.                          |
| 19 | MEMBER PERKINS: And if there's a               |
| 20 | limit to what our budget, our deficit and the  |
| 21 | taxpayers can do. We could make all the        |
| 22 | return on investment arguments and             |

| 1  |  |
|----|--|
|    | Page 169                                       |
| 1  | justifications we want. It's not going to      |
| 2  | create a dollar more for revenue that can be   |
| 3  | appropriated for this mission.                 |
| 4  | MEMBER DIONNE: Although it might               |
| 5  | encourage somebody to decide, yes, this is a   |
| 6  | good place to invest a certain number of NOAA  |
| 7  | dollars.                                       |
| 8  | MEMBER PERKINS: Yes. Commenting                |
| 9  | on the chart of the future and the innovation  |
| 10 | and the winning strategy that was in the State |
| 11 | of the Union Address and the seasonal aspect   |
| 12 | of an electronic nautical chart, you can go to |
| 13 | the commercial market space, spend \$199 and   |
| 14 | buy a Garmin GPS that will interface with      |
| 15 | real-time traffic systems and tell you that    |
| 16 | there's slow traffic two miles ahead up on the |
| 17 | road. But we can't put seasonal information    |
| 18 | onto electronic nautical charts? Maybe we      |
| 19 | need to outreach more to the private sector    |
| 20 | for some innovation.                           |
| 21 | Your comment, Chairman Welch,                  |
| 22 | earlier about the balance between the private  |
|    |  |

|    | Page 170                                       |
|----|--|
| 1  | sector and in-house capability, and maybe the  |
| 2  | balance has been struck or maybe the battle    |
| 3  | hasn't been fought yet. The commercial         |
| 4  | marketplace has solved that for safety of      |
| 5  | navigation for vehicles. We need to move that  |
| б  | to the wet side.                               |
| 7  | CHAIR WELCH: All right. Gerd, do               |
| 8  | you have any kind of closing comments on this  |
| 9  | part of the program?                           |
| 10 | CAPTAIN GLANG: We had a lot of                 |
| 11 | good ideas here in the last few minutes. So    |
| 12 | I don't have any per se.                       |
| 13 | What I'm hoping is that we                     |
| 14 | continue some conversations offline in the     |
| 15 | next few days. Heard a couple of good ideas    |
| 16 | that could become sort of focused areas. And   |
| 17 | if nothing else, they're areas where the Panel |
| 18 | could seek more information. We could provide  |
| 19 | that. Perhaps better understand our fleet      |
| 20 | allocation process with an aim towards better  |
| 21 | understanding the efficiency issues. So, it    |
| 22 | could be just an education role and maybe      |

Page 171

1 something comes out of that.

| 2  | But, you know there are some other             |
|----|--|
| 3  | ideas here that in the Myers-Briggs world, an  |
| 4  | ISTJ way up there in that corner, so it takes  |
| 5  | me a while to think things through and         |
| б  | regurgitate them. But I was going back to      |
| 7  | what Gary Jeffress mentioned on jobs and the   |
| 8  | economy. And I think there's an important      |
| 9  | theme there that we really ought to spend some |
| 10 | more time on. I think that's something that    |
| 11 | resonates all the way up through NOAA and up   |
| 12 | through Commerce. So we should probably spend  |
| 13 | a little bit more time on that.                |
| 14 | And there may be some areas. So                |
| 15 | I'll just kind of leave it at that and hope we |
| 16 | have a continuing conversation.                |
| 17 | CHAIR WELCH: Okay. And Paul                    |
| 18 | Bradley wanted to make a comment.              |
| 19 | MR. BRADLEY: Yes, thanks, Ed.                  |
| 20 | I just wanted to maybe help. I                 |
| 21 | think I'm at the same place in the Myers-      |
| 22 | Briggs chart as Gary, but I tried to pull some |

|    | Page 172                                       |
|----|--|
| 1  | of this together. And it seems like just       |
| 2  | hearing the discussion, it's been fantastic.   |
| 3  | A lot of excellent comments. And you guys      |
| 4  | obviously get the challenges that NOAA and the |
| 5  | Navigation Services are dealing with. And it   |
| 6  | seems like keeping those in mind both at these |
| 7  | meetings and also in your day-to-day           |
| 8  | professional lives it will be tremendously     |
| 9  | helpful to the Panel and to NOAA.              |
| 10 | For example, at the meetings we're             |
| 11 | going to hear from some great stakeholder      |
| 12 | panels, and some of them on very specific      |
| 13 | topics and some of them on bigger picture      |
| 14 | topics. But taking that information and        |
| 15 | trying to synthesize it all together in        |
| 16 | relation to one of these challenges and one of |
| 17 | the issues that's address in the Strategic     |
| 18 | Guidance document is critical. It's important  |
| 19 | that you need to translate that information    |
| 20 | for NOAA into this is what you need to do, but |
| 21 | also in your day-to-day professional lives     |
| 22 | keep an eye out for how is NOAA doing on       |

Page 173 1 stakeholder outreach? Are the folks in my 2 professional community understanding the 3 services they provide? Are they hitting the mark in term of those services? What other 4 5 needs are there? And we can work with the meeting agendas to make sure all those are 6 7 being addressed. 8 And then also within the comments 9 it seems like there's some other issues, just as Sherri has mentioned and others. For 10 example, the seasonally managed area, the NOAA 11 12 ship time, user fees; issues like that where it seems like there might be some benefit to 13 14 some more extensive conversations and dialogue outside of the time allotment that we have for 15 these semi-annual meetings. It might be worth 16 it to hold some kind of a teleconference or 17 18 focus group to talk about those issues in more 19 depth if you see some value to that. 20 So, just a couple of thoughts to 21 keep in mind, but I think it's been a great

22 conversation so far.

|    | Page 174                                       |
|----|--|
| 1  | CHAIR WELCH: Okay. Very good.                  |
| 2  | Yes, I'm going to have Captain                 |
| 3  | Lowell wrap up this morning.                   |
| 4  | CAPT. LOWELL: I just want to take              |
| 5  | a moment to acknowledge a co-workers involved  |
| 6  | in this strategic discussion we've been have   |
| 7  | here.  |
| 8  | Most of you know Roger Parsons,                |
| 9  | who's a very good friend and a co-worker over  |
| 10 | the last, it's maybe 38 years I believe he was |
| 11 | in government service. And many of you have    |
| 12 | worked with him in the past, and we're very    |
| 13 | sorry to see him leave. But he was             |
| 14 | instrumental in putting this document          |
| 15 | together. I would recommend that if you        |
| 16 | haven't read it, it has some of these similar  |
| 17 | issues that we just talked about on here. It's |
| 18 | not meant to be all inclusive. It's not meant  |
| 19 | to say that these are the things you need to   |
| 20 | focus on, but I think we've discussed a lot of |
| 21 | the directions we want to head. And I just     |
| 22 | wanted to acknowledge Roger's involvement in   |

| Page 1751this. So thank you.2CHAIR WELCH: Okay. Thank you.3And we will, those of us who4worked with Roger and knew him as a colleague5and a friend are very sadden by his passing.6And we send our sympathies to all of his NOAA7colleagues that worked with him for so long.8Are administrative things that we9need to talk about right now, Kath?10MS. WATSON: No. Lunch is ready.11We do have the dinner schedule for12the Hau Tree Lanai, but I wanted to try to get13an head count of how many people are planning14to go down there. We can do that later this15afternoon at the break.16CHAIR WELCH: And my17understanding, of course, is that we would all18be paying for our share of that dinner, is19that correct?20MS. WATSON: Yes.21CHAIR WELCH: Okay. Just so22everybody knows.   |    |  |
|---|----|--|
| 2CHAIR WELCH: Okay. Thank you.3And we will, those of us who4worked with Roger and knew him as a colleague5and a friend are very sadden by his passing.6And we send our sympathies to all of his NOAA7colleagues that worked with him for so long.8Are administrative things that we9need to talk about right now, Kathy?10MS. WATSON: No. Lunch is ready.11We do have the dinner schedule for12the Hau Tree Lanai, but I wanted to try to get13an head count of how many people are planning14to go down there. We can do that later this15afternoon at the break.16CHAIR WELCH: And my17understanding, of course, is that we would all18be paying for our share of that dinner, is19MS. WATSON: Yes.20MS. WATSON: Yes.21CHAIR WELCH: Okay. Just so   |    | Page 175                                       |
| 3       And we will, those of us who         4       worked with Roger and knew him as a colleague         5       and a friend are very sadden by his passing.         6       And we send our sympathies to all of his NOAA         7       colleagues that worked with him for so long.         8       Are administrative things that we         9       need to talk about right now, Kathy?         10       MS. WATSON: No. Lunch is ready.         11       We do have the dinner schedule for         12       the Hau Tree Lanai, but I wanted to try to get         13       an head count of how many people are planning         14       to go down there. We can do that later this         15       afternoon at the break.         16       CHAIR WELCH: And my         17       understanding, of course, is that we would all         18       be paying for our share of that dinner, is         19       that correct?         20       MS. WATSON: Yes.         21       CHAIR WELCH: Okay. Just so | 1  | this. So thank you.                            |
| <ul> <li>worked with Roger and knew him as a colleague</li> <li>and a friend are very sadden by his passing.</li> <li>And we send our sympathies to all of his NOAA</li> <li>colleagues that worked with him for so long.</li> <li>Are administrative things that we</li> <li>need to talk about right now, Kathy?</li> <li>MS. WATSON: No. Lunch is ready.</li> <li>We do have the dinner schedule for</li> <li>the Hau Tree Lanai, but I wanted to try to get</li> <li>an head count of how many people are planning</li> <li>to go down there. We can do that later this</li> <li>afternoon at the break.</li> <li>CHAIR WELCH: And my</li> <li>understanding, of course, is that we would all</li> <li>be paying for our share of that dinner, is</li> <li>that correct?</li> <li>MS. WATSON: Yes.</li> <li>CHAIR WELCH: Okay. Just so</li> </ul>   | 2  | CHAIR WELCH: Okay. Thank you.                  |
| 5       and a friend are very sadden by his passing.         6       And we send our sympathies to all of his NOAA         7       colleagues that worked with him for so long.         8       Are administrative things that we         9       need to talk about right now, Kathy?         10       MS. WATSON: No. Lunch is ready.         11       We do have the dinner schedule for         12       the Hau Tree Lanai, but I wanted to try to get         13       an head count of how many people are planning         14       to go down there. We can do that later this         15       afternoon at the break.         16       CHAIR WELCH: And my         17       understanding, of course, is that we would all         18       be paying for our share of that dinner, is         19       that correct?         20       MS. WATSON: Yes.         21       CHAIR WELCH: Okay. Just so  | 3  | And we will, those of us who                   |
| 6And we send our sympathies to all of his NOAA7colleagues that worked with him for so long.8Are administrative things that we9need to talk about right now, Kathy?10MS. WATSON: No. Lunch is ready.11We do have the dinner schedule for12the Hau Tree Lanai, but I wanted to try to get13an head count of how many people are planning14to go down there. We can do that later this15afternoon at the break.16CHAIR WELCH: And my17understanding, of course, is that we would all18be paying for our share of that dinner, is19that correct?20MS. WATSON: Yes.21CHAIR WELCH: Okay. Just so  | 4  | worked with Roger and knew him as a colleague  |
| <ul> <li>colleagues that worked with him for so long.</li> <li>Are administrative things that we</li> <li>need to talk about right now, Kathy?</li> <li>MS. WATSON: No. Lunch is ready.</li> <li>We do have the dinner schedule for</li> <li>the Hau Tree Lanai, but I wanted to try to get</li> <li>an head count of how many people are planning</li> <li>to go down there. We can do that later this</li> <li>afternoon at the break.</li> <li>CHAIR WELCH: And my</li> <li>understanding, of course, is that we would all</li> <li>be paying for our share of that dinner, is</li> <li>that correct?</li> <li>MS. WATSON: Yes.</li> <li>CHAIR WELCH: Okay. Just so</li> </ul>   | 5  | and a friend are very sadden by his passing.   |
| 8Are administrative things that we9need to talk about right now, Kathy?10MS. WATSON: No. Lunch is ready.11We do have the dinner schedule for12the Hau Tree Lanai, but I wanted to try to get13an head count of how many people are planning14to go down there. We can do that later this15afternoon at the break.16CHAIR WELCH: And my17understanding, of course, is that we would all18be paying for our share of that dinner, is19that correct?20MS. WATSON: Yes.21CHAIR WELCH: Okay. Just so   | 6  | And we send our sympathies to all of his NOAA  |
| <ul> <li>9 need to talk about right now, Kathy?</li> <li>10 MS. WATSON: No. Lunch is ready.</li> <li>11 We do have the dinner schedule for</li> <li>12 the Hau Tree Lanai, but I wanted to try to get</li> <li>13 an head count of how many people are planning</li> <li>14 to go down there. We can do that later this</li> <li>15 afternoon at the break.</li> <li>16 CHAIR WELCH: And my</li> <li>17 understanding, of course, is that we would all</li> <li>18 be paying for our share of that dinner, is</li> <li>19 that correct?</li> <li>20 MS. WATSON: Yes.</li> <li>21 CHAIR WELCH: Okay. Just so</li> </ul>  | 7  | colleagues that worked with him for so long.   |
| <ul> <li>MS. WATSON: No. Lunch is ready.</li> <li>We do have the dinner schedule for</li> <li>the Hau Tree Lanai, but I wanted to try to get</li> <li>an head count of how many people are planning</li> <li>to go down there. We can do that later this</li> <li>afternoon at the break.</li> <li>CHAIR WELCH: And my</li> <li>understanding, of course, is that we would all</li> <li>be paying for our share of that dinner, is</li> <li>that correct?</li> <li>MS. WATSON: Yes.</li> <li>CHAIR WELCH: Okay. Just so</li> </ul>  | 8  | Are administrative things that we              |
| 11We do have the dinner schedule for12the Hau Tree Lanai, but I wanted to try to get13an head count of how many people are planning14to go down there. We can do that later this15afternoon at the break.16CHAIR WELCH: And my17understanding, of course, is that we would all18be paying for our share of that dinner, is19that correct?20MS. WATSON: Yes.21CHAIR WELCH: Okay. Just so   | 9  | need to talk about right now, Kathy?           |
| 12 the Hau Tree Lanai, but I wanted to try to get<br>an head count of how many people are planning<br>to go down there. We can do that later this<br>afternoon at the break. 16 CHAIR WELCH: And my<br>understanding, of course, is that we would all<br>be paying for our share of that dinner, is<br>that correct? 20 MS. WATSON: Yes. 21 CHAIR WELCH: Okay. Just so  | 10 | MS. WATSON: No. Lunch is ready.                |
| <ul> <li>13 an head count of how many people are planning</li> <li>14 to go down there. We can do that later this</li> <li>15 afternoon at the break.</li> <li>16 CHAIR WELCH: And my</li> <li>17 understanding, of course, is that we would all</li> <li>18 be paying for our share of that dinner, is</li> <li>19 that correct?</li> <li>20 MS. WATSON: Yes.</li> <li>21 CHAIR WELCH: Okay. Just so</li> </ul>  | 11 | We do have the dinner schedule for             |
| 14 to go down there. We can do that later this<br>afternoon at the break. 16 CHAIR WELCH: And my 17 understanding, of course, is that we would all 18 be paying for our share of that dinner, is 19 that correct? 20 MS. WATSON: Yes. 21 CHAIR WELCH: Okay. Just so   | 12 | the Hau Tree Lanai, but I wanted to try to get |
| <pre>15 afternoon at the break.<br/>16 CHAIR WELCH: And my<br/>17 understanding, of course, is that we would all<br/>18 be paying for our share of that dinner, is<br/>19 that correct?<br/>20 MS. WATSON: Yes.<br/>21 CHAIR WELCH: Okay. Just so</pre>   | 13 | an head count of how many people are planning  |
| 16 CHAIR WELCH: And my 17 understanding, of course, is that we would all 18 be paying for our share of that dinner, is 19 that correct? 20 MS. WATSON: Yes. 21 CHAIR WELCH: Okay. Just so   | 14 | to go down there. We can do that later this    |
| <ul> <li>17 understanding, of course, is that we would all</li> <li>18 be paying for our share of that dinner, is</li> <li>19 that correct?</li> <li>20 MS. WATSON: Yes.</li> <li>21 CHAIR WELCH: Okay. Just so</li> </ul>  | 15 | afternoon at the break.                        |
| <pre>18 be paying for our share of that dinner, is<br/>19 that correct?<br/>20 MS. WATSON: Yes.<br/>21 CHAIR WELCH: Okay. Just so</pre>   | 16 | CHAIR WELCH: And my                            |
| <pre>19 that correct? 20 MS. WATSON: Yes. 21 CHAIR WELCH: Okay. Just so</pre>   | 17 | understanding, of course, is that we would all |
| 20 MS. WATSON: Yes.<br>21 CHAIR WELCH: Okay. Just so  | 18 | be paying for our share of that dinner, is     |
| 21 CHAIR WELCH: Okay. Just so   | 19 | that correct?                                  |
|   | 20 | MS. WATSON: Yes.                               |
| 22 everybody knows.   | 21 | CHAIR WELCH: Okay. Just so                     |
|   | 22 | everybody knows.                               |

|    | Page 176                                       |
|----|--|
| 1  | Virginia?                                      |
| 2  | MS. DENTLER: Could anybody from                |
| 3  | Pacific Navigation Services Stakeholder Panel  |
| 4  | is here, if they want to give me their         |
| 5  | presentation, I'll see them at lunch.          |
| 6  | CHAIR WELCH: Okay. And just a                  |
| 7  | reminder to all of our guests, first, thanks   |
| 8  | for coming. And if you didn't sign in to our   |
| 9  | guest sheet, if you would do so, we would very |
| 10 | much appreciate that.                          |
| 11 | So lunch is here in this room,                 |
| 12 | Kathy? It's a buffet lunch.                    |
| 13 | And I guess, as always, the Panel              |
| 14 | members and the NOAA Agency folks for whom the |
| 15 | lunch is intended, but I guess if we have      |
| 16 | guests and you might want to make sure that    |
| 17 | the official folks get their food, then you're |
| 18 | welcome to the scraps.                         |
| 19 | Okay. We will reconvene at 1:00.               |
| 20 | (Whereupon, the above-entitled                 |
| 21 | matter went off the record at 12:10 p.m. and   |
| 22 | resumed at 1:04 p.m.)                          |

|    | Page 177                                       |
|----|--|
| 1  | A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N                |
| 2  | 1:04 p.m.                                      |
| 3  | CHAIR WELCH: Okay. Good                        |
| 4  | afternoon, everyone. Let's reconvene our       |
| 5  | Hydrographic Services Review Panel.            |
| 6  | And what our plans for this                    |
| 7  | afternoon is, is we will receive some reports  |
| 8  | from the three line agencies within NOAA and   |
| 9  | within the National Ocean Service that do      |
| 10 | navigation services. And then after a short    |
| 11 | break we will hear from our first users panel. |
| 12 | So welcome to our members of the               |
| 13 | public that are here for our users panel, and  |
| 14 | we will be with you in the not too far distant |
| 15 | future. But our first presentation will be     |
| 16 | made by our government folks. So, Captain      |
| 17 | Lowell, are you going first or what order are  |
| 18 | we going to do?                                |
| 19 | CAPT. LOWELL: I think so.                      |
| 20 | CHAIR WELCH: Okay.                             |
| 21 | CAPT. LOWELL: Thank you, Ed.                   |
| 22 | As Ed said, this will be an update             |

|    | Page 178                                       |
|----|--|
| 1  | of all three offices that I put together, try  |
| 2  | to catch everyone up on where we're at and     |
| 3  | what big ticket issues we've been working on   |
| 4  | and a quick snapshot of the budget environment |
| 5  | as of a couple of days ago.                    |
| 6  | Okay. First off, we're going to                |
| 7  | cover a couple of recent accomplishments       |
| 8  | CHAIR WELCH: Captain, do all the               |
| 9  | new Panelists know what each of the three line |
| 10 | agencies are?                                  |
| 11 | CAPT. LOWELL: I think so.                      |
| 12 | CHAIR WELCH: Okay. I'm just                    |
| 13 | wondering if it might be worth a 60 second     |
| 14 | summary.                                       |
| 15 | CAPT. LOWELL: A 60 second                      |
| 16 | summary?                                       |
| 17 | Office of Coast Survey. Office of              |
| 18 | Coast Survey is primarily responsible for the  |
| 19 | hydrographic and bathymetric data collection   |
| 20 | within the U.S. territorial waters, the        |
| 21 | exception to that being in authorized channels |
| 22 | which the U.S. Army of Corps of Engineers      |

Page 179 1 provide us data to update the nautical charts. 2 The second component of what we do 3 is our premium -- these are our charts that we create and are 1,000 meter charts, 800 plus 4 5 ENC at this point. A part of our services, of course, 6 7 is maritime customers. We also have a lab, of 8 course on technology issues that will be 9 surface vessels and modeling physical 10 oceanographics and policy. So that's a what we do. 11 12 CHAIR WELCH: Well, good. So 13 thank you. 14 CAPT. LOWELL: Okay. Because we 15 intend these presentations as kind of a 16 background, so that's probably a good idea. 17 So, getting back to the 18 presentations, the recent accomplishments. As 19 everyone knows there was a big earthquake out 20 in Japan that generated a tsunami, major 21 damage on the Japanese islands. And there was a considerable activity at NOAA for the next 22

|    | Page 180                                       |
|----|--|
| 1  | 12 to 24 hours to track the projected tsunami  |
| 2  | where it's going to hit landfall, including    |
| 3  | Hawaii. We've discussed a little of that       |
| 4  | here, but it also reached the West Coast and   |
| 5  | certain harbors in the West Coast seemed to be |
| 6  | more prone to the tsunami damage. And the two  |
| 7  | that took a lot of damage on the West Coast    |
| 8  | was Crescent City, which has been hit by       |
| 9  | tsunamis before and Santa Cruz. And generally  |
| 10 | in a response- type environment is that NOAA   |
| 11 | and the other federal agencies coordinated     |
| 12 | very closely together generally with a         |
| 13 | Navigation Manager in the region. They look    |
| 14 | at assets available to open up these harbors   |
| 15 | again. In this case this is the kind of thing  |
| 16 | we would do. And we deployed appropriate       |
| 17 | assets, whether it be ships or contractors, or |
| 18 | in this case we have NRTs or navigational      |
| 19 | response teams and one of their primary        |
| 20 | functions is response to hazards.              |
| 21 | And we happened to have one team               |
| 22 | down in San Fran, San Francisco doing routine  |
Page 181 1 hydrographic work, they deployed up to 2 Crescent City. We had another one working out of 3 Takoma, Washington, another team, hydrographic 4 5 surveys. And they went down to Santa Cruz. This is a picture of some of the damage there. 6 7 And in these environments the key 8 is to detect submerged objects and get the 9 port open as quick as possible, pretty much to 10 not only start the mitigation phase of the repair, but also to allow any remaining 11 12 vessels that are capable of continuing whatever work they were doing, such as the 13 fishing industry, as you'd open this up to 14 continue to allow the fishing industry to open 15 16 In this case, they needed to bring in up. barges to start lifting a lot of these wrecks 17 18 where they turned into very damaged boats out 19 of the water. 20 So we were on-site within, I 21 think, around two days of the tsunami reaching 22 these two ports.

|    | Page 182                                       |
|----|--|
| 1  | Next slide.                                    |
| 2  | CHAIR WELCH: John, there                       |
| 3  | traditionally are two navigation response      |
| 4  | teams on the Pacific Coast?                    |
| 5  | CAPT. LOWELL: Well, they do move               |
| 6  | around but there's typically two of them out   |
| 7  | there. We typically have one in the Great      |
| 8  | Lakes, although I believe we're bring that     |
| 9  | down to Houston next year when the weather     |
| 10 | gets really bad up on the Lakes. And we have   |
| 11 | several more in the Gulf on the East Coast. We |
| 12 | have six altogether.                           |
| 13 | CHAIR WELCH: And do I remember                 |
| 14 | correctly that there were some large envelop   |
| 15 | of locating one in Alaska eventually?          |
| 16 | CAPT. LOWELL: That's currently                 |
| 17 | not on the schedule. Alaska would be a whole   |
| 18 | lot more difficult. Not that we couldn't do    |
| 19 | a small team up there, but moving them around. |
| 20 | We typically rely on both infrastructure and   |
| 21 | the roads, of course. A lot of that is         |
| 22 | natural up in Alaska with the RVs around. It   |

|    | Page 183                                      |
|----|---|
| 1  | isn't saying we couldn't do something like    |
| 2  | that, but it would be a difficult             |
| 3  | CHAIR WELCH: Okay. I'm just                   |
| 4  | remembering. Okay.                            |
| 5  | CAPT. LOWELL: Recently we've had              |
| б  | several Arctic-type issues up there. This was |
| 7  | just another one that everyone probably       |
| 8  | remembers the Selendang Ayu, which was a      |
| 9  | vessel that lost power north of the Aleutian  |
| 10 | Chain up in the Bering Sea. It was blown down |
| 11 | on the rocks, broke in half, spilled quite a  |
| 12 | bit of oil.                                   |
| 13 | So there was another similar event            |
| 14 | here recently, December 3rd, where the $M/V$  |
| 15 | Golden Sea lost propulsion, very similar to   |
| 16 | what happened to the Selendang Ayu. But it's  |
| 17 | a very similar incident and we watched it.    |
| 18 | Eventually they did get the vessel going and  |
| 19 | it moved out of harm's way.                   |
| 20 | But usually in these type of                  |
| 21 | response activities is we're there to provide |
| 22 | support and let everybody know how it is NOAA |

| Page 184                                       |
|--|
| can help the response effort. In this case,    |
| you know, we'd be contacting the Weather       |
| Service and other areas to watch where the     |
| vessel may go and how to respond to it.        |
| Next slide.                                    |
| This particular thing, obviously               |
| we responded last year to the Deepwater event. |
| Oil spill response or disaster preparedness in |
| general, I'll make this a little more general  |
| than an oil spill, is something we're heavily  |
| involved in both with our nav managers and     |
| with our NRTs and other assets. And that they  |
| do considerable coordination and training in   |
| conjunction with other federal agencies,       |
| specifically the Coast Guard, with state and   |
| local agencies that would be involved in       |
| disaster management.                           |
| And in this particular case this               |
| is an example of a planned Marathon Oil spill  |
| exercise in New Orleans and Tampa. And         |
| actually, I think Kyle was involved with the   |
| diver training off Hawaii's coast.             |
|  |

|    | Page 185                                       |
|----|--|
| 1  | And that's kind of lighter, but                |
| 2  | it's an offloading to get oil to the island.   |
| 3  | Next slide, please.                            |
| 4  | You know we in the discussion this             |
| 5  | morning talked about other uses and users of   |
| 6  | our data. We do collect a lot of hydrographic  |
| 7  | data specifically for the purpose of safety in |
| 8  | navigation; that's our mandate. But when we    |
| 9  | can we also take the expertise that we build   |
| 10 | doing that and help other organizations both   |
| 11 | within NOS and within NOAA and even broader    |
| 12 | then that with data collection that they may   |
| 13 | have. And a good example of that will be the   |
| 14 | NCCOS, which is a sister agency of NOS or      |
| 15 | sister office with NOS, had some benthic       |
| 16 | habitat mapping or coral reef mapping they     |
| 17 | were involved in off of St. Thomas/St. John.   |
| 18 | And we provided several hydrographers out      |
| 19 | there to operate the equipment and ensure that |
| 20 | we were collecting not only good and           |
| 21 | backscattered type data for their habitat      |
| 22 | work, but also get involved in navigational    |

Page 186 1 bathymetry that then we could then apply to 2 the proper chart. So it's a good example of it wasn't our project, but we helped out in a 3 way so that we leveraged that particular data 4 5 collection asset so we got good quality 6 bathymetric data. 7 Next please. 8 I might not going to go through 9 all these. These are pretty much the areas we've been operating recently. 10 If you hit the button, I think 11 12 there's going to be a few that slide out. We've talked about the Arctic 13 14 Recently the Arctic as the ice recedes here. there's more and more erosion on the shore and 15 16 some of the villages are at risk. So the nav 17 manager up there is helping relocate -- one of the parts involved in the relocation of one of 18 19 the villages. 20 Dave Kennedy referenced earlier, 21 we had to draft an Arctic charting plan up 22 there which correlates pretty much all the

|    | Page 187                                       |
|----|--|
| 1  | information from the Navigation Services. And  |
| 2  | anybody who wants to get a copy of that,       |
| 3  | there's links on our website. And anybody who  |
| 4  | has comments can start sending them in.        |
| 5  | It's hard to say when the charting             |
| 6  | plans will be final. What it means is we'll    |
| 7  | just complete our comment selection, we'll set |
| 8  | a charting and a hydrographic data collection  |
| 9  | plan based on our expected resources. And      |
| 10 | then from there we'll just simply modify the   |
| 11 | time that the data's resources go up or down.  |
| 12 | But at least we've set the stage for where we  |
| 13 | want to go with our products and services up   |
| 14 | in the Arctic.                                 |
| 15 | The wreck found in Cobscook, the               |
| 16 | letter from Captain Peacock that has been      |
| 17 | referenced before. We found several of the     |
| 18 | sunken fishing vessels and generally there's   |
| 19 | a bit of a time lag, but they'll the local     |
| 20 | police and local divers on it and, of course,  |
| 21 | the dead bodies off the vessels. And that's    |
| 22 | been ongoing. I think the last one was found   |

|    | Page 188                                       |
|----|--|
| 1  | about two months ago. So that project's now    |
| 2  | complete. We've done the entire Cobscook.      |
| 3  | And it's just a matter of them diving to all   |
| 4  | the objectives and confirming whether they are |
| 5  | the lost vessels and/or any bodies that may    |
| 6  | still be down there.                           |
| 7  | There's some local work on the                 |
| 8  | coal ships. I think that's at Norfolk.         |
| 9  | Bathy data to aid Mississippi                  |
| 10 | restoration and bathy data to aid the recovery |
| 11 | of the Gulf of Mexico for recreational         |
| 12 | fishing. Obviously, there's a lot of effort    |
| 13 | in the Gulf right now. And we're just playing  |
| 14 | our part there, we're certainly not the lead   |
| 15 | agency on that. But we're using the            |
| 16 | knowledge, skills, ability of Coast Survey     |
| 17 | where appropriate to help out to enable that   |
| 18 | effort.  |
| 19 | Next slide, please.                            |
| 20 | Future outlook for FY '12. Even                |
| 21 | in this tight budget environment we felt it    |
| 22 | was important to have a continued presence in  |

|    | Page 189                                      |
|----|---|
| 1  | the Arctic. We've scheduled in fair weather   |
| 2  | to do a survey in '10 Bering Straits area, to |
| 3  | continue to operate up there. Consequently,   |
| 4  | we have high a critical area and we directed  |
| 5  | them to continue the operations up there.     |
| б  | We also leveraged some other                  |
| 7  | activities with VDatum, so we're balancing    |
| 8  | some tide gauge work up there to support that |
| 9  | effort.                                       |
| 10 | Either Tom or Sherri mentioned the            |
| 11 | Hassler. Without going into a whole lot of    |
| 12 | details, there was some contractual issues    |
| 13 | with the Hassler. They didn't meet the        |
| 14 | statement of work and they terminated the     |
| 15 | contract abruptly with the ship builder and   |
| 16 | they towed it out of there under the          |
| 17 | protection of Marshals, and which meant that  |
| 18 | NOAA had a 95 percent completed vessel. NOAA  |
| 19 | shipyard had a ship in the Arctic and nobody  |
| 20 | to work on it.                                |
| 21 | And so they then actively try and             |
| 22 | put it back together with the remaining funds |
|    |   |

|    | Page 190                                       |
|----|--|
| 1  | that they didn't make. And right now as of     |
| 2  | last week they've gotten underway several      |
| 3  | times and working on their Coast Guard         |
| 4  | certificates and their NDIS certification. So  |
| 5  | they have scheduled 30 days this year. We      |
| 6  | have negotiated with OMAO to try to get an     |
| 7  | additional 30 days over a two month period,    |
| 8  | which means, again fully realizing we're going |
| 9  | to have a whole lot of new ship startup        |
| 10 | issues, we don't want to get too far from      |
| 11 | home. We do expect to get some data out of     |
| 12 | that vessel this year.                         |
| 13 | I didn't bring any of the actual               |
| 14 | charts, but the actual data holdings are going |
| 15 | down and the amount of time it takes us from   |
| 16 | the completion of the survey to the delivery   |
| 17 | on the nautical chart to the end user is       |
| 18 | decreasing as we speak. We have a nominal      |
| 19 | goal of 50 surveys in inventory with most      |
| 20 | surveys coming in in less then 120 days, and   |
| 21 | more appropriate in and out below 90 days for  |
| 22 | delivery of the products.                      |

Page 191 Particularly to support IOCM 1 2 initiatives. Just mention several of the examples of that because we are actively 3 looking for IOCM participation. And where 4 5 other people are surveying, we want to know 6 about it and we want to get involved with them 7 to either increase our involvement with the 8 survey or if we're in that area, expand that area if we can for nominal cost to add value 9 10 to the data collection we're already updating. Implementation of the R2R. R2R is 11 12 Rolling Deck to Repository efforts, and that goes across NOAA vessels. We, as with the 13 14 UNOLS actually has a similar program to this where a lot of scientists go out, they collect 15 16 their data. They park the vessel with their 17 data and then nobody sees it again for years 18 and years and years, maybe. The inference is 19 the infamous data disappeared in someone's 20 drawer. Both UNOLS which is the university 21 vessels and NOAA have identified this as a 22 serious problem. You know, government is

Page 192 1 typically attached there to pay for the 2 cruises and they do acknowledge that the window of opportunity for the control and 3 release of that data to allow the science to 4 5 occur but have some known time frame of this data to be released to the archive or the NGDC 6 7 for public availability. And when we're doing 8 that, is of course we're allowing the scientists take it off but there's a direct 9 link from NGDC to the vessels who collect the 10 data because NGDC has specific control or 11 12 release of that data for a period of time. 13 You're going to ask me what that 14 time is, but I can't tell you. MEMBER DIONNE: So the data 15 16 actually -- they're not required to copy data over to NGDC before they leave? 17 It has to be reviewed later or --18 19 CAPT. LOWELL: No. We will do 20 that for them. The R2R effort means that we 21 don't have to walk on ship. We only copy the 22 data.

|    | Page 193                                       |
|----|--|
| 1  | Typically there's a clause in the              |
| 2  | grant or whatever their funding mechanism is   |
| 3  | that you shall share the data upon completion  |
| 4  | of it. It doesn't always work.                 |
| 5  | Finalize the strategic action plan             |
| 6  | for the mapping component of the National      |
| 7  | Ocean Policy. Captain Glang talked a little    |
| 8  | bit about these strategic action plans and     |
| 9  | that's pretty much how we're going to          |
| 10 | implement the various nine priority check list |
| 11 | that talked about national policy. And this    |
| 12 | particular one, I believe, is the ninth one,   |
| 13 | which is the infrastructure to the national    |
| 14 | policy. And once that's ready for we can       |
| 15 | distribute that, the action plan, once it's    |
| 16 | ready, right?                                  |
| 17 | CAPT. GLANG: Yes. There's                      |
| 18 | actually a public comment period to the        |
| 19 | strategic action plans that's coming up soon.  |
| 20 | CAPT. LOWELL: So once we get                   |
| 21 | that, you can get them. Actually, any of the   |
| 22 | nine should be listed.                         |

|    | Page 194                                      |
|----|---|
| 1  | Next slide, please.                           |
| 2  | Some of the parts of my job are               |
| 3  | not overly fun. Had several visits up to the  |
| 4  | Hill for different reasons, not all of them   |
| 5  | were pretty.                                  |
| 6  | One, a committee that we have                 |
| 7  | never really dealt with before, the House     |
| 8  | Committee on Oversight and Government Reform. |
| 9  | It's a committee that looks for efficiency in |
| 10 | the government, you know for production of    |
| 11 | duplication, that type of thing.              |
| 12 | It was noted that there are two               |
| 13 | agencies in government that create nautical   |
| 14 | charts. One is DoD NGA, National Geospatial   |
| 15 | Agency who created DNCs, which is a military  |
| 16 | version of a that's not quite right. It's     |
| 17 | a digital nautical chart but it's a different |
| 18 | format then the commercial ENC that the Coast |
| 19 | Guard most of the non-DoD people are          |
| 20 | familiar with ENCs.                           |
| 21 | There's also a different suite of             |
| 22 | paper charts. NOAA creates paper charts for   |
|    |   |

|    | Page 195                                       |
|----|--|
| 1  | all the U.S. waters, NGA creates paper charts  |
| 2  | for the rest of the world. And NGA's           |
| 3  | customer, of course, is the U.S. Navy. NOAA's  |
| 4  | customer is everybody else. Well, the U.S.     |
| 5  | Navy does use NOAA products in U.S.            |
| 6  | territorial waters.                            |
| 7  | They noted that that seemed to be              |
| 8  | a duplication of effort and both NGA and NOAA  |
| 9  | have gone now to talk to this Committee to     |
| 10 | explain to them what these products are, who   |
| 11 | the customers are and whether any duplication  |
| 12 | exists. And there's no duplication there.      |
| 13 | They're are different there's a multitude      |
| 14 | of different customers. And NGA's intent is    |
| 15 | in the next generation of ENC, which is coming |
| 16 | out approximately in the middle year and       |
| 17 | probably converted over to the next generation |
| 18 | ENC. I would say between three and five years  |
| 19 | now we'll start that process. And when that    |
| 20 | occurs, NGA will be working with Navy. I do    |
| 21 | know the Office of Navy users in fact, Navy    |
| 22 | will shift their DNC product to an ENC         |

|    | Page 196                                      |
|----|---|
| 1  | product. But that's a DoD decision.           |
| 2  | MEMBER MILLER: Was there any                  |
| 3  | discussion of the sort of duplication of      |
| 4  | survey capabilities between NAVOCEANO that    |
| 5  | doesn't oversee NOAA, Army Corps, et cetera?  |
| 6  | CAPT. LOWELL: They were almost a              |
| 7  | 100 percent focused on the charting product.  |
| 8  | We did mention that we have managed for U.S.  |
| 9  | territorial waters the survey and we create   |
| 10 | products for that. And NGA they don't collect |
| 11 | it  |
| 12 | MEMBER MILLER: There has been                 |
| 13 | some in Saipan, out in the Western Pacific.   |
| 14 | There has been some overlap between NAVO and  |
| 15 | NOAA.   |
| 16 | CAPT. LOWELL: Not so much overlap             |
| 17 | as we're aware of all the activities they're  |
| 18 | doing.  |
| 19 | MEMBER MILLER: Yes.                           |
| 20 | CAPT. LOWELL: And we, obviously,              |
| 21 | share our survey plans with Navy. And we do   |
| 22 | control that fairly well. And I think the     |

|    | Page 197                                       |
|----|--|
| 1  | only time that we would overlap would be is    |
| 2  | that we're trying to confirm the use of LIDR.  |
| 3  | MEMBER MILLER: Yes.                            |
| 4  | CAPT. LOWELL: Anyway, that's just              |
| 5  | a little exciting                              |
| 6  | CHAIR WELCH: Well, do you have                 |
| 7  | any perception of the staff's view of things   |
| 8  | after they received the briefing?              |
| 9  | CAPT. LOWELL: I think they were                |
| 10 | focused. In their view there seems to be       |
| 11 | considerable duplication even though both NGA  |
| 12 | and NOAA feel there is no duplication; there's |
| 13 | no duplication of customers, there's no        |
| 14 | duplication products but they're pretty much   |
| 15 | on I don't know how to explain that.           |
| 16 | MEMBER BRIGHAM: Yes, but my                    |
| 17 | question is do you know the order of magnitude |
| 18 | between the different budget amounts spent by  |
| 19 | NGA and NAVOCEANO and you all?                 |
| 20 | CAPT. LOWELL: No. I really don't               |
| 21 | know all that. I know what we spent, but I     |
| 22 | have no idea what Navy spends.                 |

|    | Page 198                                       |
|----|--|
| 1  | MEMBER BRIGHAM: It would seem                  |
| 2  | that, you know DoD is going to be asked to     |
| 3  | cut. And they're not going to cut probably     |
| 4  | aircraft carriers and submarines, but          |
| 5  | attendant programs like NGA and NAVOCEANO are  |
| 6  | good targets. So I wonder if any of those      |
| 7  | responsibilities might in the next 30 years    |
| 8  | transfer over to NOAA?                         |
| 9  | CAPT. LOWELL: Well, that was not               |
| 10 | discussed in a real way. And as I mentioned,   |
| 11 | they were not approached at all on the data    |
| 12 | acquisition side.                              |
| 13 | MEMBER BRIGHAM: Yes.                           |
| 14 | CAPT. LOWELL: When we talk about               |
| 15 | it, we defer to them whether we were together, |
| 16 | they were focused on the products. I mean it   |
| 17 | is just an example of the kinds of things that |
| 18 | we work on, unfortunately too often.           |
| 19 | Next slide, please.                            |
| 20 | Linking back to the oh no, this                |
| 21 | continues on. Okay. I don't even know how to   |
| 22 | apply a lot of these slides in here.           |

Page 199 1 Within NOAA, it wasn't really 2 discussed earlier today, but as part of this effort of reducing duplication, there is 3 within DoC an attempt to cut back on some 4 5 perceived duplication of Commerce activities. 6 And we do believe NOAA is getting a bit caught 7 up in that. There have been some comments 8 that would seem to indicate overlap in things 9 like management of fish stocks. I'm not sure 10 any of that is true. I don't work for Fisheries. But I don't believe that National 11 Marine Fisheries and Fish and Wildlife Service 12 have much overlap at all. 13 But there is an 14 attempt to kind of try to better align Commerce entities more with the Commerce side 15 of the house and less on the environmental 16 side of the house. 17 18 So I don't really have a lot to 19 say about that other than it's on both. 20 Next slide. 21 CHAIR WELCH: John, go back to 22 that quote. This quote is from the document

| -  | Page 200                                      |
|----|---|
| 1  | produced by whom?                             |
| 2  | MR. BRADLEY: The Center for                   |
| 3  | American Progress. It's a report that they    |
| 4  | put together.                                 |
| 5  | CHAIR WELCH: What is the Center               |
| б  | for American Progress?                        |
| 7  | MR. BRADLEY: I can tell you it's              |
| 8  | a nonprofit organization. I don't know much   |
| 9  | more about the reason for generating the      |
| 10 | report, although the reason that we took a    |
| 11 | look at it is, I guess, is just referring to  |
| 12 | it as they look at government structure and   |
| 13 | whether there appears some good reasons for   |
| 14 | reorganizing it.                              |
| 15 | CHAIR WELCH: Well didn't the                  |
| 16 | State of the Union say something about salmon |
| 17 | were regulated by seven different agencies?   |
| 18 | MR. BRADLEY: Yes. That's a                    |
| 19 | comment describing some interests from folks  |
| 20 | that depending on whether they're swimming in |
| 21 | fresh water, salt water or sitting on your    |
| 22 | plate there's some controversy.               |

Page 201 CHAIR WELCH: All right. 1 2 CAPT. LOWELL: All right. Next 3 slide, please. This is the budget slide. I think 4 5 this is almost the last one. It gives 6 everybody an idea of what we actually had in 7 FY '10. And if you just focus on the bottom 8 line, as you can see it went from 94,800 to 9 93,200. 10 The FY '12 estimate in the President's budget that is floating around, 11 12 don't think that 96,400 is really going to be real at all. I think the starting number will 13 be the FY `11 when it comes on. That's not the 14 actual number that was annualized, the CR 15 16 number. 17 Next slide. The metrics that we've done is as 18 19 of October we did 43,000 square nautical miles 20 of hydro data. That includes a lot of ARRA-21 funded activities. Added 72 ENCs in 2010 and 22 2011.

Page 202 In '11 we started the year. 1 We've 2 gotten about 700 miles of hydro done. The actual projected number is really based on sea 3 I don't know if we can get all our 4 data. 5 contracts out the door at this point due to 6 the delay in the budget. And then, of course, 7 we got an additional 27 ENCs. We're up to 8 about, just shy of 900 ENCs in production at 9 this point. 10 CHAIR WELCH: So your bottom, the second line is basically an effort to take the 11 12 data that you've already gotten on paper charts and put it in electronic format. 13 14 Correct it? 15 CAPT. LOWELL: Exactly. 16 CHAIR WELCH: And then make that -17 - okay. 18 CAPT. LOWELL: Yes. 19 CHAIR WELCH: So your goal is 20 within the foreseeable future held electronic 21 equivalence of a 1,000 of your paper charts? 22 CAPT. LOWELL: I would say yes,

|    | Daga 202   |
|----|--|
| 1  | Page 203<br>but a caveat to that is we do have paper |
| 2  | charts that no solo vessel would ever sail on.       |
|    |  |
| 3  | You've heard of these new charts, literally          |
| 4  | they're in such shallow areas that no vessel         |
| 5  | would ever be in there. Our intent is not            |
| 6  | really to create ENCs from certain charting          |
| 7  | processes that don't make sense.                     |
| 8  | Next slide.  |
| 9  | And that's it.                                       |
| 10 | CHAIR WELCH: Gary?                                   |
| 11 | MEMBER JEFFRESS: I had a                             |
| 12 | question.  |
| 13 | MEMBER JEFFRESS: The Deepwater                       |
| 14 | Horizon spill, discussing that with                  |
| 15 | geochemical oceanographers, if there's such a        |
| 16 | thing, with regards to chemical analysis of          |
| 17 | the ocean and marine biologists. The question        |
| 18 | is: Where did the oil go? Because not all of         |
| 19 | that washed up on the beaches.                       |
| 20 | And I know the Thomas Jefferson                      |
| 21 | was deployed to do a lot high depth sign,            |
| 22 | right? I was wondering if anyone's looked at         |

|    | Page 204                                       |
|----|--|
| 1  | the raw data from the bathymetry and see if    |
| 2  | there's not a signature in there that would    |
| 3  | tell you but is there a water hole?            |
| 4  | CAPT. LOWELL: Well, when the TJ                |
| 5  | and actually some other NOAA ships deployed,   |
| 6  | we put hydroacoustic experts on them to        |
| 7  | operate the systems. And the one thing they    |
| 8  | could determine was is they could easily see   |
| 9  | these using their systems. I don't have any of |
| 10 | those graphics here. Dr. Mayer, who is really  |
| 11 | not a member of this Panel who is not here did |
| 12 | a considerable amount of work on that.         |
| 13 | I will say that they didn't see                |
| 14 | oil in the water column itself, but they could |
| 15 | see indications that there was some sort of an |
| 16 | hydrocarbon there, and they confirmed that     |
| 17 | using the CTD-type casts and barometers to     |
| 18 | detect the oil. And they would have these      |
| 19 | bottom volume reflectors of some form. And     |
| 20 | they also could look at things like the        |
| 21 | scattering layer, which not so much because    |
| 22 | the scattering was there, because there was an |

Page 205 1 absence of scattering material which for some 2 reason all these critters moved out of the 3 So the expectation is that there was oil way. there. So a lot of that was going on back for 4 5 Deepwater. 6 MEMBER JEFFRESS: And I assume 7 that's going to be published at some stage? 8 CAPT. LOWELL: I would guess so. 9 You know, there's nothing but lawsuits going 10 on right now. There's going to be science reports coming out. As to how often or how 11 12 frequent that's going to happen, the entire iterative process is underway. 13 14 MEMBER JEFFRESS: Thank you. 15 CAPT. LOWELL: I guess that'll be 16 a couple of years before that all straightens 17 itself outside. It could be decades before 18 that straightens itself out. 19 CHAIR WELCH: We're not having an 20 unlimited time on questions. But, David, why don't you go ahead. 21 22 One quick one. AIS MEMBER JAY:

|    | Page 206                                       |
|----|--|
| 1  | did an identification system that would give   |
| 2  | you some objective way of mapping where your   |
| 3  | customers are basically                        |
| 4  | CAPT. LOWELL: Actually, we do                  |
| 5  | have a project undergoing right now or         |
| б  | underway right now that looks at the AIS data. |
| 7  | A lot of vessels are in the vessel track       |
| 8  | separation schemes or the fairways as          |
| 9  | expected. But what's turning up is, of         |
| 10 | course, is where else can they go. And         |
| 11 | there's definitely certainly areas and certain |
| 12 | shore cuts that vessels are taking, and then   |
| 13 | we have a group trying to analyze that in      |
| 14 | termination against and how old is the data,   |
| 15 | and what kind of risk is in the areas and to   |
| 16 | help us prioritize us area.                    |
| 17 | I won't say it's complete yet, but             |
| 18 | we'll get it into.                             |
| 19 | CHAIR WELCH: Okay. Thank you,                  |
| 20 | John.  |
| 21 | Let's move on to the National                  |
| 22 | Geodetic Survey and our Director Juliana       |
|    | L  |

|    | Page 207                                       |
|----|--|
| 1  | Blackwell.                                     |
| 2  | Juliana?                                       |
| 3  | MS. BLACKWELL: Thank you, Ed.                  |
| 4  | Okay. So the National Geodetic                 |
| 5  | Survey is the second office in this nav        |
| 6  | services triumvirate. And for those of you who |
| 7  | have been on the Panel you've heard the        |
| 8  | geodesy 101 and the GRAV-D, and I don't have   |
| 9  | time to go into a lot of details, but I'll     |
| 10 | just briefly say a few things about geodesy    |
| 11 | and the history of the National Geodetic       |
| 12 | Survey to put this into perspective.           |
| 13 | Geodesy is the study of the shape              |
| 14 | and size of the earth. The National Geodetic   |
| 15 | Survey is primarily working on the dry side of |
| 16 | the charting and the framework for the nation  |
| 17 | for a National Spatial Reference System.       |
| 18 | In 1807 Thomas Jefferson realized              |
| 19 | right off the bat we needed to be able to map  |
| 20 | and chart our new nation. And so he created    |
| 21 | the survey of the coast which over the years   |
| 22 | has changed names. It was known as the U.S.    |

| i  |  |
|----|--|
|    | Page 208                                       |
| 1  | Coast and Geodetic Survey for a long time, and |
| 2  | so therefore you have the three offices here   |
| 3  | today, Coast Survey, Geodetic Survey and CO-   |
| 4  | OPS who are the basic components of the        |
| 5  | coastal and surveying effort. So while we      |
| 6  | have separate program offices, we definitely   |
| 7  | need to work hand-in-hand in creation of our   |
| 8  | charts.  |
| 9  | The National Geodetic Survey has               |
| 10 | another mandate as part of this and in         |
| 11 | addition to this, to define, maintain, and     |
| 12 | provide access to the National Spatial         |
| 13 | Reference System, the NSRS. And what that is   |
| 14 | is the framework of which all mapping efforts  |
| 15 | should be based on within our country.         |
| 16 | The NSRS in the past has been                  |
| 17 | comprised of a lot of survey benchmarks that   |
| 18 | you all have probably seen out in the ground   |
| 19 | somewhere. The fact that these have been       |
| 20 | surveyed and positioned to accuracies better   |
| 21 | than anybody else can do it has been our       |
| 22 | mission for the last 200 plus years. As the    |

|    | Page 209                                       |
|----|--|
| 1  | nation grew, obviously the need for connecting |
| 2  | the coast from one coast to the other and      |
| 3  | border-to-border was the responsibility of     |
| 4  | what is now the National Geodetic Survey.      |
| 5  | So things like latitude and                    |
| 6  | longitude, elevation, gravity information, the |
| 7  | shoreline; those are all things that are under |
| 8  | our purview to define and provide to the       |
| 9  | country. So just to set the stage a little     |
| 10 | bit for some of the other things we'll be      |
| 11 | talking about over the next several years as   |
| 12 | part of this Panel. But the purpose of this    |
| 13 | is a brief update on things that we recently   |
| 14 | accomplished and things that we are planning   |
| 15 | to accomplish in the near future to give the   |
| 16 | panel members an update on some of the         |
| 17 | activities related to the most wanted          |
| 18 | improvements as defined by the reports, and    |
| 19 | the latest one being the 2010 report.          |
| 20 | So let's get into the next slide.              |
| 21 | So just to set the stage here,                 |
| 22 | some of the performance measures that the      |

|    | Page 210                                       |
|----|--|
| 1  | National Geodetic Survey has been operating    |
| 2  | under could be categorized under some of the   |
| 3  | most wanted improvements, that being           |
| 4  | disseminating our data and products to achieve |
| 5  | the greatest public benefit. And one of our    |
| 6  | GPRA or Government Performance and Results Act |
| 7  | measures is to provide a goal for the          |
| 8  | percentage of U.S. counties that are enabled   |
| 9  | with accurate positioning capacity. So         |
| 10 | basically areas that have been surveyed or     |
| 11 | have survey information in our database where  |
| 12 | the people re accessing that information count |
| 13 | towards this goal.                             |
| 14 | The second one being under                     |
| 15 | modernizing heights, which is almost a most    |
| 16 | wanted improvement, is a new GPRA measure      |
| 17 | that's going to be in effect in 2013. It will  |
| 18 | be stated something such as the percent of     |
| 19 | U.S. that's enabled to benefit from a new      |
| 20 | national vertical reference system. And I      |
| 21 | don't have time to go into a lot of that, but  |
| 22 | you'll see as things are discussed with GRAV-D |

|    | Page 211                                       |
|----|--|
| 1  | and the importance of elevation information,   |
| 2  | you'll see how that fits together and how that |
| 3  | is going to be the next 10 to 12 year goal for |
| 4  | the National Geodetic Survey.                  |
| 5  | And lastly, the one that probably              |
| 6  | most Panel members are aware of is             |
| 7  | aggressively map the nation's shorelines. And  |
| 8  | the National Geodetic Survey under that        |
| 9  | improvement is responsible for updating the    |
| 10 | U.S. shoreline and updating the shoreline in   |
| 11 | priority ports and also analyzing priority     |
| 12 | ports for changes. This is something we do on  |
| 13 | a yearly basis.                                |
| 14 | Next.  |
| 15 | So the joint milestones that we                |
| 16 | have between the three offices here as nav     |
| 17 | services, I just want to highlight a few of    |
| 18 | those. One is the expansion of the national    |
| 19 | VDatum program. Again, we don't have a lot of  |
| 20 | time to go into details here, but the          |
| 21 | information is available on the website about  |
| 22 | VDatum being able to translate from geodetic   |

| 1  |  |
|----|--|
|    | Page 212                                       |
| 1  | to tidal datums based on the models that have  |
| 2  | been provided. NGS is currently the lead       |
| 3  | program manager for this effort, but the Coast |
| 4  | Survey, CO-OPS and NGS effort to provide       |
| 5  | models for different regions of the country.   |
| 6  | The latest model that's been                   |
| 7  | released has been the model around Texas. The  |
| 8  | last model for the contiguous U.S. will be the |
| 9  | New England model, and that is to be released  |
| 10 | by the end of June. So we are making progress  |
| 11 | in the VDatum product that we've been working  |
| 12 | over the past several years. And we'll talk    |
| 13 | about future updates later.                    |
| 14 | The other joint milestones I want              |
| 15 | to mention quickly are working together to     |
| 16 | provide new guidelines for geospatial          |
| 17 | infrastructure for monitoring coastal and      |
| 18 | environmental change at sentinel sites and     |
| 19 | other coastal reserves. So focusing our        |
| 20 | efforts more on not just the nautical chart    |
| 21 | products and navigation, but what's happening  |
| 22 | at the coast and the importance for            |

|    | Page 213                                       |
|----|--|
| 1  | bathymetric and topographic and geodetic and   |
| 2  | tidal information along the coast for other    |
| 3  | reasons.                                       |
| 4  | And lastly, working with the other             |
| 5  | offices, in particular CO-OPS to co-locate our |
| 6  | three continuously operating reference         |
| 7  | stations at tide and water level stations so   |
| 8  | that you can have that very accurate tie       |
| 9  | between what's happening with the water levels |
| 10 | in relationship to what's happening on land.   |
| 11 | So in other words, to be able to determine     |
| 12 | whether or not a change is taking place in sea |
| 13 | level over time or if a change is taking place |
| 14 | on land; that there's signs of uplift and      |
| 15 | being able to tease out the differences        |
| 16 | between those changes. You need to have a      |
| 17 | land reference system as well as your water    |
| 18 | level references to establish it.              |
| 19 | Next.  |
| 20 | Recent accomplishments that I'll               |
| 21 | cover in the next four slides are highlighted  |
| 22 | here, one being, as I talked about our first   |

Page 214 1 GPRA measure, being able to provide data to 2 people about survey marks that have been surveyed at a highly accurate, highly precise 3 way. Be able to take that data and provide it 4 5 to the public as well as enable users to send in their data and get their results without 6 7 having the National Geodetic Survey actually 8 perform the survey work or manually have to do 9 the processing or adjustment. 10 We have a online positioning user service which has been in place for several 11 12 years now. But what we have improved upon is allowing users to submit their data, not only 13 14 get an answer back about the latitude and longitude and elevation of their point 15 relative to our CORS network, but also to be 16 able to say I'd like to share my information 17 18 with the rest of the public. I will provide 19 all the other detailed information you need so 20 now other surveyors or GIS individuals, or 21 anybody who is interested in that data can now 22 go on our website and see some of these other

|    | Page 215                                      |
|----|---|
| 1  | positions that have been surveyed by non-NGS  |
| 2  | folks and shared and updated over time.       |
| 3  | The second bullet here is                     |
| 4  | collected we've collected emergency           |
| 5  | response imagery in the Red River area.       |
| б  | That's Minnesota and North Dakota flooding    |
| 7  | that's been in the news.                      |
| 8  | While this is a emergency response            |
| 9  | that we've done for things such as hurricanes |
| 10 | and other natural disasters, certainly with   |
| 11 | this flooding episode having the aerial       |
| 12 | imagery collected and accessible for response |
| 13 | efforts, but primarily for validating         |
| 14 | hydrological models and forecasts. This data  |
| 15 | has been really helpful to be able to say we  |
| 16 | predicted this, we've taken pictures of it,   |
| 17 | this is exactly what or not what we expected  |
| 18 | to happen in these areas based on the amount  |
| 19 | of water that's been calculated.              |
| 20 | Another emergency response that I             |
| 21 | don't have up here because I didn't update my |
| 22 | slides over the past couple of days and,      |

|    | Page 216                                       |
|----|--|
| 1  | Virginia, I don't know if you can transition   |
| 2  | to that easily, is the collection of imagery   |
| 3  | in the Tuscaloosa area. So the National        |
| 4  | Geodetic Survey finished their airborne        |
| 5  | imagery collection in Minnesota and North      |
| б  | Dakota area in transit back to their           |
| 7  | getting back to their work that they had       |
| 8  | planned to do, did some aerial imagery         |
| 9  | collection in the Alabama/Mississippi area to  |
| 10 | capture the damage from all the recent tornado |
| 11 | activity. This was done in conjunction and     |
| 12 | request from the National Weather Service, one |
| 13 | of our other parts of NOAA that we want to be  |
| 14 | able to work collaboratively with, to be able  |
| 15 | to identify where the tornados have been and   |
| 16 | measure and map that.                          |
| 17 | Also, in areas where their radars              |
| 18 | were down, this has provided a lot of useful   |
| 19 | information so that they can measure the       |
| 20 | length that the tornados and the path.         |
| 21 | Let's go back to the slides.                   |
| 22 | This data is available in the                  |
|    |  |
|    | Page 217                                       |
|----|--|
| 1  | public domain. It's not up on the NGS website  |
| 2  | right now, but is probably something that we   |
| 3  | need accessible soon via our website.          |
| 4  | Next slide.                                    |
| 5  | Recent accomplishments continued.              |
| 6  | Mobile Bay project. Again a tri-office         |
| 7  | effort, a multi-year effort in Mobile Bay area |
| 8  | to establish foundational data and help to     |
| 9  | calibrate or validate coastal circulation      |
| 10 | models. So something again that I think        |
| 11 | Michele had mentioned earlier was being able   |
| 12 | to use our data, use our information and to    |
| 13 | not necessarily just for navigation purposes   |
| 14 | but for other uses as well. So this, again,    |
| 15 | is a multi-year three office effort to focus   |
| 16 | on the Mobile Bay area to provide more         |
| 17 | information with our partners at the NERRS and |
| 18 | other entities within Mobile Bay.              |
| 19 | The second bullet is talking about             |
| 20 | our cooperative effort with the U.S.           |
| 21 | Geological Survey and the Harris-Galveston     |
| 22 | Subsidence District. In an area that is prone  |

|    | Page 218                                       |
|----|--|
| 1  | to subsidence and has ground water withdrawal  |
| 2  | management concerns, it's important to be able |
| 3  | to monitor what's happening at the surface of  |
| 4  | the land, but also what's happening underneath |
| 5  | there. So we've worked collaboratively to      |
| б  | establish a new CORS station at a specific     |
| 7  | site in the Houston area to provide better     |
| 8  | monitoring capabilities in that location.      |
| 9  | Next.  |
| 10 | NGS has also initiated a                       |
| 11 | socioeconomic benefit study of our remote      |
| 12 | sensing products and services. This falls      |
| 13 | under what we were also talking about this     |
| 14 | morning of being able to put some economic     |
| 15 | value on the products and services and data    |
| 16 | that we provide.                               |
| 17 | The National Geodetic Survey did a             |
| 18 | scoping study on the National Spatial          |
| 19 | Reference System, our CORS program, 2009/2010  |
| 20 | time frame. And there are some handouts in     |
| 21 | the back of the room here that go into a lot   |
| 22 | more detail about this. But basically          |

Page 219

1 recognizing the need to be able to sell the 2 value of what we provide to the Hill, to our 3 public sector, to our other federal agencies. 4 The scoping study has been very helpful for 5 NGS in being able to value our products and 6 services.

7 The National Spatial Reference 8 System alone has been valued at more than \$2.4 9 billion in potential annual benefits to the U.S. economy. And that's a big number, and it 10 encompasses a lot of things. But if you break 11 12 that down into a little bit more manageable piece, the actual CORS network, of which there 13 14 are over 1600 continuously operating reference stations, that we collected by access to that 15 data is valued at an estimated \$758 million 16 17 per year in benefits to the country. 18 Another program, the GRAV-D 19 project, which I'll mention here again, is 20 also something that has been scoped out as 21 being able to provide an estimated \$522 22 million per year estimated generated once we

Page 220 1 implement a new vertical reference system 2 based on our GRAV-D project. The second bullet is our remote 3 sensing capability, our recent accomplishment 4 5 being that we were able to recently finish a procurement of an airborne LIDAR system. 6 This 7 is to be used for the research and development 8 of new procedures. Again, trying to find 9 better techniques and efficiencies in the way data is collected and utilized for things like 10 shoreline mapping and airport surveys, which 11 12 is also something the National Geodetic Survey is involved with in conjunction with the FAA. 13 14 So, again, not for a necessarily production mode, but for a developmental mode 15 this LIDAR is going to be able to give us a 16 new technology to work with at our disposal. 17 18 Next. 19 GRAV-D is the Gravity for the 20 Redefinition of the American Vertical Datum. 21 It is primarily an airborne gravity collection 22 project which will then at the completion be

|    | Page 22  | 21 |
|----|--|----|
| 1  | able to be used as the basis for a gravimetric |    |
| 2  | geoid and a new vertical system for            |    |
| 3  | determining elevations. And it's way too       |    |
| 4  | complicated to get into right now, but you'll  |    |
| 5  | hearing more from me about GRAV-D.             |    |
| 6  | The focus has been on collecting               |    |
| 7  | data in Alaska, and the areas in black are     |    |
| 8  | where the data has already been collected.     |    |
| 9  | The areas that you see in green are currently  |    |
| 10 | being collected on one of the NOAA P-3 planes  |    |
| 11 | that we have. The northern part of Alaska is   |    |
| 12 | being flown as we speak, and the other green   |    |
| 13 | area will be collected hopefully by the end of |    |
| 14 | this fiscal year.                              |    |
| 15 | There are plans to complete all                |    |
| 16 | but the Aleutian part of the Alaska territory  |    |
| 17 | by the end of FY '12.                          |    |
| 18 | Also in conjunction with this it's             |    |
| 19 | important to be able to measure land-based     |    |
| 20 | gravity measurements to validate these models. |    |
| 21 | And so we have procured a new absolute         |    |
| 22 | gravimeter that will enable us to do this more |    |

Page 222 1 efficiently. 2 And the last bullet here, I have new horizontal time dependent positioning 3 model. Again, just a new release of improved 4 5 information available to our users. 6 Next. 7 Upcoming activities. Some of our 8 milestones for this year. When I say "install one NOAA foundational core site," this is of 9 the 1600 stations I mentioned earlier, NOAA 10 owns about 60 of them. And these are 11 12 typically in places that support other NOAA functions, not necessarily those of the 13 14 National Geodetic Survey. We are going to actually establish a site that's geodetically 15 needed to complete our NSRS. 16 17 The second bullet here, complete 18 GPS positions for the International Great 19 Lakes Datum of 2015 update. And I can talk about that more offline since I'm sure I'm out 20 21 of time or about out of time. 22 Next.

|    | Page 223                                       |
|----|--|
| 1  | Other upcoming activities. Some I              |
| 2  | mentioned earlier this morning. I believe      |
| 3  | working with Homeland Security or other        |
| 4  | efforts in emergency response. But in a sense  |
| 5  | an emergency response effort, we've been asked |
| 6  | by DHS to partner with them in being able to   |
| 7  | provide notices about GPS interference         |
| 8  | detection based on our CORS network. We are    |
| 9  | currently working with them through an         |
| 10 | agreement and reimbursement for some of this   |
| 11 | work so that we would provide them             |
| 12 | notification if we saw something strange       |
| 13 | happening with our GPS data that we're         |
| 14 | collecting. And that would feed into what      |
| 15 | they're doing with GPS interference detection. |
| 16 | Complete our socioeconomic study               |
| 17 | on the remote sensing products and services,   |
| 18 | realizing that this project takes a while to   |
| 19 | get started and to get the final report done,  |
| 20 | which will be done by a contractor. Our goal   |
| 21 | is to have it done by the end of FY '12.       |
| 22 | And I mentioned this already,                  |

|    | Page 224                                       |
|----|--|
| 1  | completing Alaska with the exception of the    |
| 2  | Aleutians by the end of next fiscal year. And  |
| 3  | also completing our VDatum models for Puerto   |
| 4  | Rico and the Virgin Islands. That's another    |
| 5  | goal that we have in the next year and a half. |
| 6  | And the last one is provide NOAA               |
| 7  | composite shoreline as a framework data set    |
| 8  | for Coastal Marine and Spatial Planning Data   |
| 9  | portal.  |
| 10 | Next.  |
| 11 | So here are the performance                    |
| 12 | metrics that I started out with, and just a    |
| 13 | snapshot of what we completed in FY '10, what  |
| 14 | our goals are for FY '11 and those that are    |
| 15 | targets for FY '12. Again, FY '12 is going to  |
| 16 | be a little bit budget-dependent on the bottom |
| 17 | three because they are all based on the        |
| 18 | mapping and charting budget line that we get   |
| 19 | through our offices.                           |
| 20 | So the second one here is the                  |
| 21 | GRAV-D, new GPRA, and currently we are on      |
| 22 | schedule to complete 13 percent of the area    |
|    |  |

|    | Page 225                                       |
|----|--|
| 1  | for GRAV-D by the end of this fiscal year.     |
| 2  | And next year's goal is at 20 percent. Again,  |
| 3  | that's budget dependent.                       |
| 4  | Next.  |
| 5  | And there's a snapshot of our NGS              |
| 6  | budget for last year and this year's tentative |
| 7  | budget. Again, this year and next year are     |
| 8  | subject to change. But as you can see,         |
| 9  | similar to what Captain Lowell mentioned for   |
| 10 | Coast Survey, there's been a small decline, a  |
| 11 | decrease in this year's budget, FY '11,        |
| 12 | overall, and FY '12 is looking like it will    |
| 13 | probably not remain at that level that I have  |
| 14 | here on the slide. But keep our fingers        |
| 15 | crossed.                                       |
| 16 | Geodesy base, that's the big chunk             |
| 17 | of our budget. The National Height             |
| 18 | Modernization program, we do get appropriated  |
| 19 | funds for that. This year we did not receive   |
| 20 | any of the earmarks, Congressionally mandated  |
| 21 | funds, for some of the other areas that have   |
| 22 | been the focus of the National Height          |

Page 226 1 Modernization program. 2 And, again, the mapping and charting base is down a little bit this year 3 and probably, and we'll see what happens next 4 5 year. 6 And that's it. Right on time. 7 CHAIR WELCH: Okay. Juliana. 8 Well, thank you. Are there questions or comments for Juliana? 9 10 VICE CHAIR WELLSLAGER: Juliana, the Department of Homeland Security, is that --11 a issue for GPS detection? 12 13 MS. BLACKWELL: No. 14 MEMBER BRIGHAM: How much is Defense Department a user of this information? 15 MS. BLACKWELL: Of the information 16 that I had on the slide for DHS or all of it? 17 MEMBER BRIGHAM: Just about the --18 19 MS. BLACKWELL: They won't tell 20 us. 21 MEMBER BRIGHAM: So then they are 22 using it?

|    | Page 227                                       |
|----|--|
| 1  | MS. BLACKWELL: Yes, they are                   |
| 2  | using it.                                      |
| 3  | MEMBER BRIGHAM: But you're the                 |
| 4  | only ones that do it for terrestrial United    |
| 5  | States?  |
| б  | MS. BLACKWELL: That's correct.                 |
| 7  | MEMBER BRIGHAM: Okay.                          |
| 8  | MS. BLACKWELL: I mean, I couldn't              |
| 9  | even speak to what all they do, but we do work |
| 10 | with NGA and other entities when we have       |
| 11 | common needs and data that we collect. But I   |
| 12 | don't have an answer for it; how much of our   |
| 13 | data they use for their efforts.               |
| 14 | MEMBER BRIGHAM: Yes, I know.                   |
| 15 | They don't have a reciprocal identical         |
| 16 | organization that's doing what you're doing?   |
| 17 | MS. BLACKWELL: No. I hope they                 |
| 18 | will not be testifying on the Hill             |
| 19 | MEMBER BRIGHAM: Well, I mean at                |
| 20 | least for this overlap question, how many      |
| 21 | government agencies do we need to do this?     |
| 22 | And I understand the security implications of  |

|    | Page 228                                      |
|----|---|
| 1  | using satellite technology and all that added |
| 2  | to this. But you're the baseline.             |
| 3  | MS. BLACKWELL: We are the                     |
| 4  | baseline for the nation. And so DoD really is |
| 5  | looking more internationally and focusing on  |
| б  | that.   |
| 7  | I will say that the USGS is really            |
| 8  | the group that we are confused with most      |
| 9  | often. And just to make a statement that the  |
| 10 | National Geodetic Survey does not make maps.  |
| 11 | That's the other guys. That's USGS. We        |
| 12 | provide the framework, you know, make sure    |
| 13 | that it fits together right, we provide that  |
| 14 | basic foundational information for the        |
| 15 | surveys, whether it's Army Corps of Engineers |
| 16 | or USGS or state and local entities. Any time |
| 17 | that folks are doing something certainly that |
| 18 | crosses state boundaries, you want to make    |
| 19 | sure they're on a basic framework. So we      |
| 20 | don't produce maps. The only thing we come    |
| 21 | close to is the shoreline delineation for a   |
| 22 | nautical chart. But, again, it's hard for     |

|    | Page 229                                       |
|----|--|
| 1  | people to fathom what it is that we do if      |
| 2  | we're not providing the topo maps that you're  |
| 3  | used to seeing. But the fact is that they      |
| 4  | couldn't produce those or produce those        |
| 5  | accurately if they didn't know what their      |
| 6  | starting points were.                          |
| 7  | So, hopefully, we'll be able to                |
| 8  | explain our unique role in the federal         |
| 9  | government to anyone who asks. But the         |
| 10 | questions of the mapping and how many          |
| 11 | different federal agencies do mapping          |
| 12 | everyone does something a little bit           |
| 13 | differently. But we are working with those     |
| 14 | federal agencies to make sure that they        |
| 15 | understand our role and that they're using our |
| 16 | data and datums to reference their geospatial  |
| 17 | information so that it is a common so          |
| 18 | things fit together. And GIS users and         |
| 19 | everybody else that want things to match up    |
| 20 | will do so because they're using the national  |
| 21 | datums that we provide.                        |
| 22 | MEMBER PERKINS: A couple of                    |

|    | Page 230                                      |
|----|---|
| 1  | questions. Scott Perkins.                     |
| 2  | The response to the Tuscaloosa,               |
| 3  | Alabama tornado damage, did the Weather       |
| 4  | Service reimburse NGS, NOAA for the           |
| 5  | aircraft time and operation?                  |
| 6  | MS. BLACKWELL: Since this is                  |
| 7  | still fresh, I don't even know if they've     |
| 8  | finished collecting the data. I believe they  |
| 9  | have, but I've been sort of out of touch with |
| 10 | flying to Hawaii yesterday and not getting    |
| 11 | caught up on everything.                      |
| 12 | I would imagine that it's not                 |
| 13 | going to be a reimbursable type of effort.    |
| 14 | But, you know, as part of our NOAA, one NOAA, |
| 15 | we need to respond and support other line     |
| 16 | offices. And this has been a pretty small     |
| 17 | effort on our part to collect data for,       |
| 18 | perhaps, five days at the most. I don't have  |
| 19 | exact figures. It's a lot of goodwill and     |
| 20 | good collaboration with another line office   |
| 21 | that we don't really have a whole lot in      |
| 22 | common.                                       |

|    | Page 231                                       |
|----|--|
| 1  | MEMBER PERKINS: Was the response               |
| 2  | to the flooding up in North Dakota on the Red  |
| 3  | River, was that at the request of FEMA or was  |
| 4  | that for the Weather Service?                  |
| 5  | MS. BLACKWELL: Again, I think                  |
| 6  | it's probably more then one entity. I mean,    |
| 7  | from a Weather Service perspective being able  |
| 8  | to validate their predictions and their models |
| 9  | I think was key. But the National Geodetic     |
| 10 | Survey in this emergency response effort works |
| 11 | with several different federal agencies. And   |
| 12 | if Mike Aslaksen were here, he would be able   |
| 13 | to rattle off all the acronyms that he's lead  |
| 14 | on as far as remote sensing capabilities go.   |
| 15 | But it's usually a group decision that's made. |
| 16 | And Weather Service certainly had a need, FEMA |
| 17 | had a need. I don't have all the details on    |
| 18 | that, but I can get that for you.              |
| 19 | MEMBER PERKINS: Thank you.                     |
| 20 | CHAIR WELCH: Any other questions?              |
| 21 | Yes, Gary?                                     |
| 22 | MEMBER JEFFRESS: One of the                    |
|    |  |

|    | Page 232                                       |
|----|--|
| 1  | benefits that Juliana has not touched on which |
| 2  | is fairly new, it's ongoing research, is the   |
| 3  | use of use of CORS data, the precise geodetic  |
| 4  | data that CORS comes up with.                  |
| 5  | One of the problems with                       |
| 6  | satellite navigation systems is what happens   |
| 7  | to the signal as it goes through the           |
| 8  | ionosphere and the troposphere. And that's     |
| 9  | why precise GPS has at least two signals       |
| 10 | because there's slightly different time delay  |
| 11 | caused by the error introduced by the          |
| 12 | ionosphere and the troposphere.                |
| 13 | One of the things that, ever since             |
| 14 | satellite navigation systems have been around  |
| 15 | is to model the amount of water vapor in the   |
| 16 | troposphere to get that out of the error       |
| 17 | and of course the algorithms do that pretty    |
| 18 | good now because they've been doing it since   |
| 19 | the 1960s. If you reverse-engineer that, you   |
| 20 | know exactly where you are like the CORS       |
| 21 | stations do, you can reverse-engineer that     |
| 22 | tropospheric model and actually use the GPS    |

| 1  |   |
|----|---|
|    | Page 233                                      |
| 1  | signal to measure water vapor.                |
| 2  | And now the National Weather                  |
| 3  | Service and the National Center for           |
| 4  | Atmospheric Research is doing a lot of        |
| 5  | research on using the CORS data to measure    |
| 6  | water vapor across the United States in real  |
| 7  | time. And most of these CORS stations         |
| 8  | actually measure about every five seconds and |
| 9  | they mesasure multiple satellites at the same |
| 10 | time.   |
| 11 | So every minute of every day or               |
| 12 | every five seconds it's getting shots of      |
| 13 | measuring the water vapor in the atmosphere   |
| 14 | which is improving weather forecasting. And   |
| 15 | it's another spin-off of the CORS network.    |
| 16 | MS. BLACKWELL: Thank you, Gary.               |
| 17 | And that's true.                              |
| 18 | Basically just to summarize, using            |
| 19 | that information to tell what the water vapor |
| 20 | is, and I think it's like a five minute       |
| 21 | there's a little bit of delay, it's not exact |
| 22 | real time. But use that for I don't know.     |

Page 234

Probably in the tornado predictions that were obviously not too accurate. I can't think of the word I'm looking for. But we're right on, unfortunately, certainly in this most recent event.
MEMBER JEFFRESS: One of the

7 things we've been working with these guys at 8 NCAR and University Consortium for Atmospheric 9 Research is getting some of these CORS station in the middle of the Gulf of Mexico to track 10 11 hurricanes and then to measure the water vapor 12 as it's being radically changed in the hurricanes. 13 14 CHAIR WELCH: Okay. Thank you, 15 Gary, and thank you, Juliana. 16 So let's move now to Richard 17 Edwing and the Center for Operational Oceanographic Products and Services known as 18 19 CO-OPS. 20 Okay. Thank you, Ed. MR. EDWING: 21 So my 60 second summary is, you 22 know our elevator phrase for what we do is

| Page<br>1 turning operational physical oceanographic<br>2 data into meaningful information for the<br>3 nation. And, as Juliana said, you know our<br>4 roots go back to Thomas Jefferson's days back<br>5 when, you know, to get a ship into or out of | 235 |
|---|-----|
| 2 data into meaningful information for the<br>3 nation. And, as Juliana said, you know our<br>4 roots go back to Thomas Jefferson's days back   |     |
| 3 nation. And, as Juliana said, you know our 4 roots go back to Thomas Jefferson's days back  |     |
| 4 roots go back to Thomas Jefferson's days back   |     |
|   |     |
| 5 when, you know, to get a ship into or out of  |     |
|   |     |
| 6 a harbor safely, you needed to be able to   |     |
| 7 position it, you needed a nautical chart and  |     |
| 8 you needed tide and tidal current predictions.  |     |
| 9 And those fundamental needs really haven't  |     |
| 10 they're still here today, although technology  |     |
| 11 has really changed the way in which we do  |     |
| 12 those things.  |     |
| 13 We work together very closely. A   |     |
| 14 lot of things I do help support their  |     |
| 15 missions. We would provide that tidal data   |     |
| 16 reference framework, vertical reference  |     |
| 17 framework on the water level side, for charts  |     |
| 18 and referencing shoreline, as well as other  |     |
| 19 things these guys need.  |     |
| 20 We also provide some of our  |     |
| 21 services directly to the mariners, you know,   |     |
| 22 the tide and tidal current predictions as well   |     |

|    | Page 236                                       |
|----|--|
| 1  | as other products that technology now allows   |
| 2  | us to do. And over time, the other uses, you   |
| 3  | know, non-navigation uses have really expanded |
| 4  | and segues nicely into my update here.         |
| 5  | So next slide.                                 |
| 6  | So I'm going to present our recent             |
| 7  | accomplishments and kind of what we're going   |
| 8  | to be doing in the near future here through a  |
| 9  | slightly different lens.                       |
| 10 | We recently reorganized ourselves              |
| 11 | in terms of how we bring in customer           |
| 12 | requirements and see that through to products  |
| 13 | and services. The new members got an overview  |
| 14 | of this during the orientation briefing. I'm   |
| 15 | not sure if I've really gone through this with |
| 16 | the other members. But we have three           |
| 17 | programs, each one has a program manager in    |
| 18 | charge of it, and it really just follows what  |
| 19 | I just said. And these programs are organized  |
| 20 | by customer groups.                            |
| 21 | We used to always think of                     |
| 22 | ourselves in terms of our observing systems,   |
|    | Nool P. Crogg & Co. Ing                        |

|    | Page 237                                       |
|----|--|
| 1  | but we realized that observing systems are     |
| 2  | just a means to an end and it's all about      |
| 3  | getting the customers the products and         |
| 4  | services that they need. And they bin nicely   |
| 5  | into kind of these three broad categories. So  |
| 6  | I'm going to talk about what we're doing       |
| 7  | through these filters, and I'll say a few      |
| 8  | words about each program as I get to it.       |
| 9  | So next slide, Virginia.                       |
| 10 | So the Mapping and Charting                    |
| 11 | Support Services. CO-OPS doesn't do mapping,   |
| 12 | we don't do charting, but we support the       |
| 13 | mapping and charting missions of Coast Survey  |
| 14 | and NGS. And this customer group is really     |
| 15 | the internal customer group; not just within   |
| 16 | NOAA but within the federal government because |
| 17 | there's other agencies like the Corps who have |
| 18 | the dredging mission, they need things from    |
| 19 | us, the same tidal datum, some of the same     |
| 20 | types of information.                          |
| 21 | And so under the recent                        |
| 22 | accomplishments category here, last year in    |
| I  |  |

| Page 23812010 we supported 46 different hydrographic or2shoreline surveys. We provide a lot of kind3of planning information for those projects4that are being planned in terms of tidal5zoning and product constructions and other6things, and there's other types of information7or activities that happens after those8projects are completed in terms of providing9tidal correctors and validating data and10things of that nature.11Juliana talked a little bit about12the VDatum program. We did three gauging13surveys last year; one up in Maine, another up14in Massachusetts, one up in Alaska to support15the development of new VDatum models or to16help reduce uncertainties in existing VDatum17models.18And the last bullet talks about19we're involved in a tri-agency group that's20looking to, among other things, achieve data21interoperability between gauging systems, you22know. NOAA has tide gauges out there, the |    |  |
|---|----|--|
| 2shoreline surveys. We provide a lot of kind3of planning information for those projects4that are being planned in terms of tidal5zoning and product constructions and other6things, and there's other types of information7or activities that happens after those8projects are completed in terms of providing9tidal correctors and validating data and10things of that nature.11Juliana talked a little bit about12the VDatum program. We did three gauging13surveys last year; one up in Maine, another up14in Massachusetts, one up in Alaska to support15the development of new VDatum models or to16help reduce uncertainties in existing VDatum17models.18And the last bullet talks about19we're involved in a tri-agency group that's20looking to, among other things, achieve data21interoperability between gauging systems, you   |    | Page 238                                       |
| 3of planning information for those projects4that are being planned in terms of tidal5zoning and product constructions and other6things, and there's other types of information7or activities that happens after those8projects are completed in terms of providing9tidal correctors and validating data and10things of that nature.11Juliana talked a little bit about12the VDatum program. We did three gauging13surveys last year; one up in Maine, another up14in Massachusetts, one up in Alaska to support15the development of new VDatum models or to16help reduce uncertainties in existing VDatum17models.18And the last bullet talks about19we're involved in a tri-agency group that's20looking to, among other things, achieve data21interoperability between gauging systems, you   | 1  | 2010 we supported 46 different hydrographic or |
| <ul> <li>that are being planned in terms of tidal</li> <li>zoning and product constructions and other</li> <li>things, and there's other types of information</li> <li>or activities that happens after those</li> <li>projects are completed in terms of providing</li> <li>tidal correctors and validating data and</li> <li>things of that nature.</li> <li>Juliana talked a little bit about</li> <li>the VDatum program. We did three gauging</li> <li>surveys last year; one up in Maine, another up</li> <li>in Massachusetts, one up in Alaska to support</li> <li>the development of new VDatum models or to</li> <li>help reduce uncertainties in existing VDatum</li> <li>models.</li> <li>And the last bullet talks about</li> <li>we're involved in a tri-agency group that's</li> <li>looking to, among other things, achieve data</li> <li>interoperability between gauging systems, you</li> </ul>                          | 2  | shoreline surveys. We provide a lot of kind    |
| <ul> <li>zoning and product constructions and other</li> <li>things, and there's other types of information</li> <li>or activities that happens after those</li> <li>projects are completed in terms of providing</li> <li>tidal correctors and validating data and</li> <li>things of that nature.</li> <li>Juliana talked a little bit about</li> <li>the VDatum program. We did three gauging</li> <li>surveys last year; one up in Maine, another up</li> <li>in Massachusetts, one up in Alaska to support</li> <li>the development of new VDatum models or to</li> <li>help reduce uncertainties in existing VDatum</li> <li>models.</li> <li>And the last bullet talks about</li> <li>we're involved in a tri-agency group that's</li> <li>looking to, among other things, achieve data</li> <li>interoperability between gauging systems, you</li> </ul>  | 3  | of planning information for those projects     |
| <ul> <li>things, and there's other types of information</li> <li>or activities that happens after those</li> <li>projects are completed in terms of providing</li> <li>tidal correctors and validating data and</li> <li>things of that nature.</li> <li>Juliana talked a little bit about</li> <li>the VDatum program. We did three gauging</li> <li>surveys last year; one up in Maine, another up</li> <li>in Massachusetts, one up in Alaska to support</li> <li>the development of new VDatum models or to</li> <li>help reduce uncertainties in existing VDatum</li> <li>models.</li> <li>And the last bullet talks about</li> <li>we're involved in a tri-agency group that's</li> <li>looking to, among other things, achieve data</li> <li>interoperability between gauging systems, you</li> </ul>  | 4  | that are being planned in terms of tidal       |
| <ul> <li>or activities that happens after those</li> <li>projects are completed in terms of providing</li> <li>tidal correctors and validating data and</li> <li>things of that nature.</li> <li>Juliana talked a little bit about</li> <li>the VDatum program. We did three gauging</li> <li>surveys last year; one up in Maine, another up</li> <li>in Massachusetts, one up in Alaska to support</li> <li>the development of new VDatum models or to</li> <li>help reduce uncertainties in existing VDatum</li> <li>models.</li> <li>And the last bullet talks about</li> <li>we're involved in a tri-agency group that's</li> <li>looking to, among other things, achieve data</li> <li>interoperability between gauging systems, you</li> </ul>  | 5  | zoning and product constructions and other     |
| 8 projects are completed in terms of providing<br>9 tidal correctors and validating data and<br>10 things of that nature.<br>11 Juliana talked a little bit about<br>12 the VDatum program. We did three gauging<br>13 surveys last year; one up in Maine, another up<br>14 in Massachusetts, one up in Alaska to support<br>15 the development of new VDatum models or to<br>16 help reduce uncertainties in existing VDatum<br>17 models.<br>18 And the last bullet talks about<br>19 we're involved in a tri-agency group that's<br>10 looking to, among other things, achieve data<br>21 interoperability between gauging systems, you  | 6  | things, and there's other types of information |
| <ul> <li>9 tidal correctors and validating data and</li> <li>10 things of that nature.</li> <li>11 Juliana talked a little bit about</li> <li>12 the VDatum program. We did three gauging</li> <li>13 surveys last year; one up in Maine, another up</li> <li>14 in Massachusetts, one up in Alaska to support</li> <li>15 the development of new VDatum models or to</li> <li>16 help reduce uncertainties in existing VDatum</li> <li>17 models.</li> <li>18 And the last bullet talks about</li> <li>19 we're involved in a tri-agency group that's</li> <li>20 looking to, among other things, achieve data</li> <li>21 interoperability between gauging systems, you</li> </ul>  | 7  | or activities that happens after those         |
| <ul> <li>10 things of that nature.</li> <li>11 Juliana talked a little bit about</li> <li>12 the VDatum program. We did three gauging</li> <li>13 surveys last year; one up in Maine, another up</li> <li>14 in Massachusetts, one up in Alaska to support</li> <li>15 the development of new VDatum models or to</li> <li>16 help reduce uncertainties in existing VDatum</li> <li>17 models.</li> <li>18 And the last bullet talks about</li> <li>19 we're involved in a tri-agency group that's</li> <li>10 looking to, among other things, achieve data</li> <li>21 interoperability between gauging systems, you</li> </ul>  | 8  | projects are completed in terms of providing   |
| 11Juliana talked a little bit about12the VDatum program. We did three gauging13surveys last year; one up in Maine, another up14in Massachusetts, one up in Alaska to support15the development of new VDatum models or to16help reduce uncertainties in existing VDatum17models.18And the last bullet talks about19we're involved in a tri-agency group that's20looking to, among other things, achieve data21interoperability between gauging systems, you  | 9  | tidal correctors and validating data and       |
| 12 the VDatum program. We did three gauging<br>13 surveys last year; one up in Maine, another up<br>14 in Massachusetts, one up in Alaska to support<br>15 the development of new VDatum models or to<br>16 help reduce uncertainties in existing VDatum<br>17 models.<br>18 And the last bullet talks about<br>19 we're involved in a tri-agency group that's<br>10 oking to, among other things, achieve data<br>21 interoperability between gauging systems, you   | 10 | things of that nature.                         |
| <pre>13 surveys last year; one up in Maine, another up 14 in Massachusetts, one up in Alaska to support 15 the development of new VDatum models or to 16 help reduce uncertainties in existing VDatum 17 models. 18 And the last bullet talks about 19 we're involved in a tri-agency group that's 20 looking to, among other things, achieve data 21 interoperability between gauging systems, you</pre>   | 11 | Juliana talked a little bit about              |
| 14 in Massachusetts, one up in Alaska to support<br>15 the development of new VDatum models or to<br>16 help reduce uncertainties in existing VDatum<br>17 models.<br>18 And the last bullet talks about<br>19 we're involved in a tri-agency group that's<br>20 looking to, among other things, achieve data<br>21 interoperability between gauging systems, you   | 12 | the VDatum program. We did three gauging       |
| 15 the development of new VDatum models or to<br>16 help reduce uncertainties in existing VDatum<br>17 models.<br>18 And the last bullet talks about<br>19 we're involved in a tri-agency group that's<br>20 looking to, among other things, achieve data<br>21 interoperability between gauging systems, you   | 13 | surveys last year; one up in Maine, another up |
| 16 help reduce uncertainties in existing VDatum<br>17 models. 18 And the last bullet talks about 19 we're involved in a tri-agency group that's 20 looking to, among other things, achieve data 21 interoperability between gauging systems, you  | 14 | in Massachusetts, one up in Alaska to support  |
| 17 models. 18 And the last bullet talks about 19 we're involved in a tri-agency group that's 20 looking to, among other things, achieve data 21 interoperability between gauging systems, you   | 15 | the development of new VDatum models or to     |
| 18And the last bullet talks about19we're involved in a tri-agency group that's20looking to, among other things, achieve data21interoperability between gauging systems, you   | 16 | help reduce uncertainties in existing VDatum   |
| 19 we're involved in a tri-agency group that's<br>20 looking to, among other things, achieve data<br>21 interoperability between gauging systems, you   | 17 | models.  |
| 20 looking to, among other things, achieve data 21 interoperability between gauging systems, you  | 18 | And the last bullet talks about                |
| 21 interoperability between gauging systems, you  | 19 | we're involved in a tri-agency group that's    |
|   | 20 | looking to, among other things, achieve data   |
| 22 know. NOAA has tide gauges out there, the  | 21 | interoperability between gauging systems, you  |
|   | 22 | know. NOAA has tide gauges out there, the      |

Page 239 1 Corps has tide gauges out there that they use 2 for their coastal projects. USGS has thousand of gauges, mostly upriver and for streams and 3 inland -- but they do have a subset that's 4 5 along the coast. 6 We've been working closely with 7 the Corps now for several years to get their 8 gauges converted to NOAA tidal datums. Thev 9 saw the light after the New Orleans and 10 Katrina incident. So we've been working mainly with USGS. 11 12 Okay. So what's it going to take to get USGS and its coastal gauges, to get 13 14 them upgraded to NOS standards? And they've been working very well with us. And so so far 15 there's been a kind of an inventory completed 16 17 and some GIS tools created to look at these 18 gauges and also an assessment of what it's 19 going to take to actually upgrade these USGS 20 gauges. 21 So future outlook. Click the 22 button there again.

|    | Page 240                                       |
|----|--|
| 1  | So this year in 2011 there's                   |
| 2  | approximately 35 hydrographic and              |
| 3  | photogrammetric projects planned. The number   |
| 4  | varies from year-to-year. And, again, we're    |
| 5  | going to be doing some more gauging surveys up |
| 6  | in Alaska and in Puerto Rico for VDatum model  |
| 7  | support.                                       |
| 8  | One bullet that's not on there is              |
| 9  | kind for the trilateral agency effort. We've   |
| 10 | picked Texas as a place to actually start      |
| 11 | doing some things with the USGS gauges in      |
| 12 | terms of approving the geodetic control of     |
| 13 | those gauges because they don't have good      |
| 14 | geodetic control right now. And they're going  |
| 15 | to convert to gauges from, I think, 15 minute  |
| 16 | data collection to our 6 minute data           |
| 17 | collection. And we're going to use that as a   |
| 18 | pilot project for a start to get the USGS      |
| 19 | gauges to provide data that could be used more |
| 20 | broadly. And I think Gary's group is involved  |
| 21 | in some of it. You can't do anything in Texas  |
| 22 | without involving Gary's group one way or      |

|    | Page 241                                       |
|----|--|
| 1  | another.                                       |
| 2  | Next slide.                                    |
| 3  | And I've got some water level                  |
| 4  | observation network stuff in here. Really,     |
| 5  | our networks double booked underneath any      |
| 6  | particular program because they support all    |
| 7  | the programs, but I wanted to talk about a few |
| 8  | things, so I kind of slide it in here.         |
| 9  | One thing we've been doing since               |
| 10 | Hurricanes Katrina and Rita destroying a lot   |
| 11 | of gauges in the Gulf. We've been hardening    |
| 12 | our stations down there, rebuilding and        |
| 13 | hardening. And hardening just means we're      |
| 14 | strengthening them a variety of ways so that,  |
| 15 | hopefully, text time they'll survive because   |
| 16 | it's one of the most important times to be     |
| 17 | getting data when there's an extreme event     |
| 18 | happening. There's a couple of levels to       |
| 19 | that.  |
| 20 | You know, if we're already on a                |
| 21 | reasonably substantial pier, we'll just        |
| 22 | usually put a steel frame underneath and get   |
|    |  |

|    | Page 242                                       |
|----|--|
| 1  | that tide station lifted up a bit so it's      |
| 2  | above the projected storm surge levels. If     |
| 3  | the pier's not very strong and it's kind of in |
| 4  | a protected area, sometimes we'll put in our   |
| 5  | four pile platform. That that's an             |
| 6  | illustration to the left there to get it up    |
| 7  | and protected. But for the open coast sites,   |
| 8  | we design something called a NOAA Sentinel and |
| 9  | then Gary talked a little bit about that       |
| 10 | earlier. And these are designed to withstand   |
| 11 | Category 4 hurricanes. That's the              |
| 12 | illustrations that are right there. It's a     |
| 13 | single pile platform, a single steel platform. |
| 14 | Those steel piles are four foot in diameter.   |
| 15 | The steel thickness, the wall thickness is one |
| 16 | to two inches depending on the design. They're |
| 17 | driven 60 to 80 feet in the bottom. They       |
| 18 | stick up about 25 to 30 feet in the air.       |
| 19 | And we got four of these in place              |
| 20 | just in time for Hurricanes Ike and Gustav,    |
| 21 | and they did really well. They obviously       |
| 22 | survived, they put out data. And they really   |

Page 243 1 proved their worth. 2 And Gary talked about two more going in off the coast of Texas. 3 And that's 4 just a great partnership. So NOAA designed, 5 it's the Corps of Engineers money, we're providing the equipment, TCOON is doing a lot 6 7 of work, but we're all going to end up winners 8 from that project. 9 So go ahead and hit the future. 10 So another thing we completed in 2010 was we completed adding meteorological 11 sensors to about 181 stations. We didn't need 12 to do it to all of them, because not all of 13 14 them were suitable for adding meteorological centers to. But we completed that effort. And 15 again, that's to provide real-time data to the 16 17 local mariner who may need it to make navigational decisions and also the Weather 18 19 Service uses this information to improve any 20 weather forecasts and storm surge models and 21 other things. 22 And then the last bullet is we're

|    | Page 244                                       |
|----|--|
| 1  | always looking for better ways to do things    |
| 2  | and we just recently completed an evaluation   |
| 3  | of a microwave water level sensor that we're   |
| 4  | looking at for our next generation primary     |
| 5  | water level sensor. Right now we use an        |
| 6  | acoustic gauge. And the problem with all of    |
| 7  | the prior technologies is all this stuff has   |
| 8  | to be down in the water to some degree and     |
| 9  | that creates issues with biofouling and        |
| 10 | silting and maintenance cost of divers and the |
| 11 | microwave sensor sits up on the side of the    |
| 12 | pier and uses microwaves to measure the water  |
| 13 | level and gets us out of the water altogether. |
| 14 | But certainly with our primary                 |
| 15 | water level sensor, before we integrated any   |
| 16 | new technology, we got to make sure we fully   |
| 17 | understand it, make sure there's no issues in  |
| 18 | there because a lot of our data, long term     |
| 19 | water level series water level trends and      |
| 20 | things we have to have confidence that we're   |
| 21 | not letting any systemic issues.               |
| 22 | So now getting to the future                   |

|    | Page 245                                       |
|----|--|
| 1  | outlook, I just talked about the two new       |
| 2  | Sentinel stations and we're going to hardening |
| 3  | an additional five stations using the four     |
| 4  | pile platform or these elevated frames this    |
| 5  | year.  |
| 6  | Next slide.                                    |
| 7  | Okay. So Maritime Services. This               |
| 8  | is where we provide products and services      |
| 9  | directly to the mariner. These kind of fall    |
| 10 | into three main bins: There's a tide and       |
| 11 | tidal current predictions and those are        |
| 12 | usually perfectly good. On an average date we  |
| 13 | don't have a lot of weather going on because   |
| 14 | these are astronomically-based.                |
| 15 | And the next two slides relate to              |
| 16 | real-time products and then the last slide is  |
| 17 | the modeling products for forecast.            |
| 18 | But to update the tide and tidal               |
| 19 | current predictions, we do we lot of tidal     |
| 20 | current surveys each year. This past year      |
| 21 | we've done some in Hawaii, Alaska, Connecticut |
| 22 | and New York to update tidal current           |

Page 246 1 predictions and their locations. 2 So, Virginia, can you click on Use your mouse to click on Hawaii 3 Hawaii. there. 4 There we go. Okay. 5 So literally just last month we completed a tidal current survey in Hawaii. 6 7 A few years ago the pilots told us, "Gee, it's 8 been a long time since a survey's been here. 9 A lot of predictions out of whack." And so we put this on. It was a total of 30 locations 10 that we put meters in. We always do these in 11 12 waves of deployment because we deploy some, measure, pick them up and put them someplace 13 14 else after downloading the data, obviously. What's that? 15 16 MS. DENTLER: Do you want me click 17 through? 18 MR. EDWING: Now don't get me 19 getting too far ahead. Don't steal thunder. 20 So is this first click or is this 21 the second? Okay. So do one more click. 22 The red dots were the first wave,

| 1  | Page 247                                       |
|----|--|
| 1  | there were 17 meters deployed. With the        |
| 2  | second wave we picked up 13 and moved them to  |
| 3  | different locations. Four of them got left in  |
| 4  | for the whole survey because we collect longer |
| 5  | time series at some locations, they're called  |
| б  | reference stations and we can improve the      |
| 7  | accuracies of shorter deployments by comparing |
| 8  | them to the longer deployments.                |
| 9  | So these are the locations in                  |
| 10 | Hawaii that they got deployed at.              |
| 11 | Now go for the last click.                     |
| 12 | But the kind of neat thing was the             |
| 13 | last wave was in place when the tsunami        |
| 14 | occurred. And, you know whenever a tsunami     |
| 15 | occurs there's lots of water level information |
| 16 | that's acquired to help improve the models and |
| 17 | things that the tsunami folks need. Well       |
| 18 | there's not a whole lot of current meters in   |
| 19 | place that pick up the tsunami, and sometimes  |
| 20 | the currents associated with a tsunami can be  |
| 21 | just as destructive as that initial wave, if   |
| 22 | you will. And the modelers, the currents part  |

| 1  |   |
|----|---|
|    | Page 248                                      |
| 1  | of their model is not nearly as good as the   |
| 2  | tsunami wave part. They just don't have this  |
| 3  | kind of post-tsunami data to use.             |
| 4  | So they were very excited about               |
| 5  | getting the data from the latter half of the  |
| 6  | survey. And this is just one of the data      |
| 7  | series. And this was the current meter that   |
| 8  | was deployed off of Kahului at the harbor in  |
| 9  | Maui. And this is where we recorded the       |
| 10 | largest tsunami wave in Hawaii. But that      |
| 11 | color graph there from left to right is       |
| 12 | chronology and left being earliest. It        |
| 13 | started the date, you see it reads to the     |
| 14 | right.  |
| 15 | From top to bottom is the water               |
| 16 | depth, if you will, the current meter we      |
| 17 | deployed. You sit on the bottom, you look up  |
| 18 | through the water columns and you take the    |
| 19 | measurements at different levels.             |
| 20 | And the blue is kind of slower                |
| 21 | velocities. Cold colors are the slower        |
| 22 | velocities and the warm colors are the higher |

|    | Page 249                                       |
|----|--|
| 1  | velocities. So if you look below you'll see    |
| 2  | that shows that tsunami wave hit Kahului and   |
| 3  | of course right above it you can see the       |
| 4  | bright green and yellow where we recorded some |
| 5  | really high velocity information there.        |
| 6  | And then you can see for days                  |
| 7  | after, you know the initial wave came through  |
| 8  | but the Pacific basin was ringing with that    |
| 9  | tsunami. And this, of course, showed up in     |
| 10 | the water levels as well.                      |
| 11 | Okay. So click that arrow to the               |
| 12 | right. No. The arrow to the right above the    |
| 13 | Google. No. Above the Google. There you go.    |
| 14 | It takes you back. Okay.                       |
| 15 | So since the Hawaii survey just                |
| 16 | happened, I wanted to point that out.          |
| 17 | One thing we did last year in                  |
| 18 | terms of products, we upgraded the website,    |
| 19 | the tide predictions part of the website just  |
| 20 | to provide a lot more bells and whistles to be |
| 21 | able to able to pull out tide predictions in   |
| 22 | terms of being able to do a lot more           |

|    | Page 250                                       |
|----|--|
| 1  | predictions on the fly, you know before you    |
| 2  | had to go in and maybe pull some information   |
| 3  | out and do it manually.                        |
| 4  | We also had different kinds of                 |
| 5  | graph presentations and just a lot more        |
| 6  | features and it makes it a more useful         |
| 7  | website.                                       |
| 8  | And after ever tidal current                   |
| 9  | survey we usually put out a special edition of |
| 10 | that survey because it takes you a year or two |
| 11 | to get it into the tide tables just because of |
| 12 | processing delay. So we kind of get a special  |
| 13 | publication out to get the information out     |
| 14 | there earlier, as well as it also gives the    |
| 15 | users a chance to kind of start using that     |
| 16 | information and they can come back and tell us |
| 17 | "Yes, this all seems really spot on" or "No,   |
| 18 | something seems a little off here" and we can  |
| 19 | look into that and try to fix it if it needs   |
| 20 | fixing before it makes it into the formal      |
| 21 | tables.  |
| 22 | And so what's coming around the                |

| Page 25<br>corner is we've additional current surveys<br>planned in Boston, San Francisco Bay, Florida<br>Keys, Fernandina Beach in Florida, as well as<br>St. Johns Pass and also up in Kachemak Bay.<br>And that's a little bit different one. That's<br>not so much for the navigation community, but<br>for a renewable energy project going on up<br>there. We're looking for more information to<br>assess whether that's a good place to do a<br>hydrokinetic-driven renewable energy project.<br>And it's actually a collaborative project with<br>a number of state entities up there.<br>Next slide.<br>So predictions are good if it's an<br>average weather day. Not so good when the<br>weather is doing something. So we provide<br>real-time data. Technology to provide real-<br>time data, mainly through the PORTS program,<br>but also our inland stations provide real-time<br>data as well.   |    |  |
|--|----|--|
| 2       planned in Boston, San Francisco Bay, Florida         3       Keys, Fernandina Beach in Florida, as well as         4       St. Johns Pass and also up in Kachemak Bay.         5       And that's a little bit different one. That's         6       not so much for the navigation community, but         7       for a renewable energy project going on up         8       there. We're looking for more information to         9       assess whether that's a good place to do a         10       hydrokinetic-driven renewable energy project.         11       And it's actually a collaborative project with         12       a number of state entities up there.         13       Next slide.         14       So predictions are good if it's an         15       average weather day. Not so good when the         16       weather is doing something. So we provide         17       real-time data. Technology to provide real-         18       time data, mainly through the PORTS program,         19       but also our inland stations provide real-time         20       data as well. |    | Page 251                                       |
| <ul> <li>Keys, Fernandina Beach in Florida, as well as</li> <li>St. Johns Pass and also up in Kachemak Bay.</li> <li>And that's a little bit different one. That's</li> <li>not so much for the navigation community, but</li> <li>for a renewable energy project going on up</li> <li>there. We're looking for more information to</li> <li>assess whether that's a good place to do a</li> <li>hydrokinetic-driven renewable energy project with</li> <li>a number of state entities up there.</li> <li>Next slide.</li> <li>So predictions are good if it's an</li> <li>average weather day. Not so good when the</li> <li>weather is doing something. So we provide</li> <li>real-time data. Technology to provide real-</li> <li>time data, mainly through the PORTS program,</li> <li>but also our inland stations provide real-time</li> <li>data as well.</li> </ul>   | 1  | corner is we've additional current surveys     |
| St. Johns Pass and also up in Kachemak Bay. And that's a little bit different one. That's not so much for the navigation community, but for a renewable energy project going on up there. We're looking for more information to assess whether that's a good place to do a hydrokinetic-driven renewable energy project. And it's actually a collaborative project with a number of state entities up there. Next slide. So predictions are good if it's an average weather day. Not so good when the weather is doing something. So we provide real-time data. Technology to provide real- time data, mainly through the PORTS program, but also our inland stations provide real-time data as well.  | 2  | planned in Boston, San Francisco Bay, Florida  |
| 5And that's a little bit different one. That's6not so much for the navigation community, but7for a renewable energy project going on up8there. We're looking for more information to9assess whether that's a good place to do a10hydrokinetic-driven renewable energy project.11And it's actually a collaborative project with12a number of state entities up there.13Next slide.14So predictions are good if it's an15average weather day. Not so good when the16weather is doing something. So we provide17real-time data. Technology to provide real-18time data, mainly through the PORTS program,19but also our inland stations provide real-time20data as well.  | 3  | Keys, Fernandina Beach in Florida, as well as  |
| <ul> <li>not so much for the navigation community, but</li> <li>for a renewable energy project going on up</li> <li>there. We're looking for more information to</li> <li>assess whether that's a good place to do a</li> <li>hydrokinetic-driven renewable energy project.</li> <li>And it's actually a collaborative project with</li> <li>a number of state entities up there.</li> <li>Next slide.</li> <li>So predictions are good if it's an</li> <li>average weather day. Not so good when the</li> <li>weather is doing something. So we provide</li> <li>real-time data. Technology to provide real-</li> <li>time data, mainly through the PORTS program,</li> <li>but also our inland stations provide real-time</li> <li>data as well.</li> </ul>  | 4  | St. Johns Pass and also up in Kachemak Bay.    |
| 7for a renewable energy project going on up8there. We're looking for more information to9assess whether that's a good place to do a10hydrokinetic-driven renewable energy project.11And it's actually a collaborative project with12a number of state entities up there.13Next slide.14So predictions are good if it's an15average weather day. Not so good when the16weather is doing something. So we provide17real-time data. Technology to provide real-18time data, mainly through the PORTS program,19but also our inland stations provide real-time20data as well.  | 5  | And that's a little bit different one. That's  |
| 8 there. We're looking for more information to<br>9 assess whether that's a good place to do a<br>10 hydrokinetic-driven renewable energy project.<br>11 And it's actually a collaborative project with<br>12 a number of state entities up there.<br>13 Next slide.<br>14 So predictions are good if it's an<br>15 average weather day. Not so good when the<br>16 weather is doing something. So we provide<br>17 real-time data. Technology to provide real-<br>18 time data, mainly through the PORTS program,<br>19 but also our inland stations provide real-time<br>20 data as well.  | б  | not so much for the navigation community, but  |
| 9 assess whether that's a good place to do a<br>hydrokinetic-driven renewable energy project.<br>And it's actually a collaborative project with<br>a number of state entities up there.<br>13 Next slide.<br>14 So predictions are good if it's an<br>15 average weather day. Not so good when the<br>weather is doing something. So we provide<br>17 real-time data. Technology to provide real-<br>18 time data, mainly through the PORTS program,<br>19 but also our inland stations provide real-time<br>20 data as well.  | 7  | for a renewable energy project going on up     |
| 10 hydrokinetic-driven renewable energy project. 11 And it's actually a collaborative project with 12 a number of state entities up there. 13 Next slide. 14 So predictions are good if it's an 15 average weather day. Not so good when the 16 weather is doing something. So we provide 17 real-time data. Technology to provide real- 18 time data, mainly through the PORTS program, 19 but also our inland stations provide real-time 20 data as well.  | 8  | there. We're looking for more information to   |
| And it's actually a collaborative project with<br>a number of state entities up there.<br>Next slide.<br>Next slide.<br>So predictions are good if it's an<br>average weather day. Not so good when the<br>weather is doing something. So we provide<br>real-time data. Technology to provide real-<br>time data, mainly through the PORTS program,<br>but also our inland stations provide real-time<br>data as well.   | 9  | assess whether that's a good place to do a     |
| 12a number of state entities up there.13Next slide.14So predictions are good if it's an15average weather day. Not so good when the16weather is doing something. So we provide17real-time data. Technology to provide real-18time data, mainly through the PORTS program,19but also our inland stations provide real-time20data as well.  | 10 | hydrokinetic-driven renewable energy project.  |
| <ul> <li>Next slide.</li> <li>So predictions are good if it's an</li> <li>average weather day. Not so good when the</li> <li>weather is doing something. So we provide</li> <li>real-time data. Technology to provide real-</li> <li>time data, mainly through the PORTS program,</li> <li>but also our inland stations provide real-time</li> <li>data as well.</li> </ul>  | 11 | And it's actually a collaborative project with |
| 14So predictions are good if it's an15average weather day. Not so good when the16weather is doing something. So we provide17real-time data. Technology to provide real-18time data, mainly through the PORTS program,19but also our inland stations provide real-time20data as well.   | 12 | a number of state entities up there.           |
| 15 average weather day. Not so good when the<br>16 weather is doing something. So we provide<br>17 real-time data. Technology to provide real-<br>18 time data, mainly through the PORTS program,<br>19 but also our inland stations provide real-time<br>20 data as well.   | 13 | Next slide.                                    |
| 16 weather is doing something. So we provide<br>17 real-time data. Technology to provide real-<br>18 time data, mainly through the PORTS program,<br>19 but also our inland stations provide real-time<br>20 data as well.   | 14 | So predictions are good if it's an             |
| <pre>17 real-time data. Technology to provide real-<br/>18 time data, mainly through the PORTS program,<br/>19 but also our inland stations provide real-time<br/>20 data as well.</pre>   | 15 | average weather day. Not so good when the      |
| 18 time data, mainly through the PORTS program,<br>19 but also our inland stations provide real-time<br>20 data as well.   | 16 | weather is doing something. So we provide      |
| <pre>19 but also our inland stations provide real-time 20 data as well.</pre>  | 17 | real-time data. Technology to provide real-    |
| 20 data as well.   | 18 | time data, mainly through the PORTS program,   |
|  | 19 | but also our inland stations provide real-time |
| 21 We recently were able to add  | 20 | data as well.                                  |
| _  | 21 | We recently were able to add                   |
| 22 visibility and waves to the sweep of  | 22 | visibility and waves to the sweep of           |

|    | Page 252                                     |
|----|--|
| 1  | environmental parameters provided by PORTS.  |
| 2  | That was our last two outstanding high       |
| 3  | priority parameters requested by the         |
| 4  | community.                                   |
| 5  | We published an economic study of            |
| 6  | the Columbia River PORTS. That's a fourth in |
| 7  | the series of studies we've done. We talked  |
| 8  | about that at the last Portland meeting.     |
| 9  | CHAIR WELCH: Rich, I'm sorry.                |
| 10 | MR. EDWING: Yes.                             |
| 11 | CHAIR WELCH: Is visibility the               |
| 12 | same thing as a fog sensing?                 |
| 13 | MR. EDWING: Yes. Yes.                        |
| 14 | CHAIR WELCH: And we talked about             |
| 15 | that at our Panel meeting in San Francisco a |
| 16 | few years ago.                               |
| 17 | MR. EDWING: Right.                           |
| 18 | CHAIR WELCH: Okay. Thanks.                   |
| 19 | MR. EDWING: Yes. It took us                  |
| 20 | quite a while to find the right sensor to    |
| 21 | operate in the marine environment for this   |
| 22 | application. So we finally got one.          |
|    | Page 253                                       |
|----|--|
| 1  | And then the last one, we                      |
| 2  | installed that air gap sensor in Jacksonville, |
| 3  | Florida. This really just happen in the last   |
| 4  | month. And it's really the acceleration of an  |
| 5  | air gap sensor that's being put in as part of  |
| 6  | a new PORTS system that's going in down there. |
| 7  | But they came to us and said "Gee, you know    |
| 8  | there's construction going on on the Dames     |
| 9  | Point Bridge. They've bulk this scaffolding."  |
| 10 | It's not quite the right word, but it's        |
| 11 | scaffolding under the bridge. "It's reduced    |
| 12 | the air gap and now Carnival Cruise Lines is   |
| 13 | balking at bringing their cruise ships into    |
| 14 | port anymore." And last year Carnival          |
| 15 | contributed over \$3 million in gross revenues |
| 16 | to the Port at Jacksonville at 50K a cruise    |
| 17 | ship coming up.                                |
| 18 | And so we've accelerated the                   |
| 19 | installation of this one air gap sensor which  |
| 20 | now gives them the comfort level they need to  |
| 21 | be able to get those vessels safely back and   |
| 22 | forth under that bridge, so that helped them   |

|    | Page 254                                       |
|----|--|
| 1  | out.   |
| 2  | So future outlook. Right now                   |
| 3  | we've got a PORTS under construction in New    |
| 4  | London, Connecticut. The Navy, the U.S. Navy's |
| 5  | our partner there, our funding partner. And    |
| 6  | that's because it's a small port, current      |
| 7  | meter, but it's to help get their subs in and  |
| 8  | out of the base safety because they have to    |
| 9  | kind of back them out into the river, and the  |
| 10 | river flow is pretty good and creates some     |
| 11 | issues.  |
| 12 | And Jacksonville is just awaiting              |
| 13 | final approval of a grant from FEMA to get     |
| 14 | that PORTS going, but if that's the case it'll |
| 15 | be the largest PORTS established to date just  |
| 16 | in terms of the numbers of sensors and things. |
| 17 | And Humboldt Bay is pretty close               |
| 18 | to it. They've got grant money to establish    |
| 19 | the PORTS service, trying to line up their own |
| 20 | end funding. So that was potentially right     |
| 21 | around the corner too if they didn't close     |
| 22 | that last year.                                |

| 1  |  |
|----|--|
|    | Page 255                                       |
| 1  | Next slide.                                    |
| 2  | Okay. So knowing what's going on               |
| 3  | right now is great, but knowing what's going   |
| 4  | to happen pretty accurately tomorrow or the    |
| 5  | next day after that is maybe even better in    |
| 6  | terms of planning your transit schedule,       |
| 7  | optimizing perhaps the cargo load on that      |
| 8  | vessel; maybe taking cargo off, maybe putting  |
| 9  | more on. So we operate these forecast models   |
| 10 | at a number of estuaries in the U.S.           |
| 11 | A big effort over the last year or             |
| 12 | two is we set up operating these models on our |
| 13 | servers at cost. We've been transitioning      |
| 14 | them over to the high performance computers,   |
| 15 | the super computers. They're operated by the   |
| 16 | Weather Service at the National Centers for    |
| 17 | Environmental Prediction. And we're not        |
| 18 | transitioning into the Weather Service, we're  |
| 19 | just sharing that capacity, if you will.       |
| 20 | And, by the way, this was a                    |
| 21 | recommendation by NOAA Science Advisory Board  |
| 22 | to do this. So recommendations can make things |

Page 256 1 happen. 2 But the advantages are they have 3 more robust operational infrastructure, the models can run a lot faster, it allows them to 4 5 do a lot more things. We can add more bells and whistles. We've done a lot of 6 7 standardization along with that. It can also be coupled with other 8 9 models that the Weather Service is running 10 which creates potential for even more power to products. So there's a steep learning curve 11 12 with that. Just lots of things to be worked 13 out, which we're pretty much through and so we've started transitioning things through. 14 Great Lakes got the first ones transitioned 15 16 through. 17 More recently we put out new 18 models for Tampa Bay and Delaware Bay. 19 We took Chesapeake Bay, which was 20 the very first model we put out a number of 21 years ago, and we retrofitted it, upgraded it 22 into the new class of models. And we put that

|    | Page 257                                       |
|----|--|
| 1  | one out there as well.                         |
| 2  | Click for the future outlook                   |
| 3  | there.   |
| 4  | And the ones around the corner are             |
| 5  | Columbia River and Northern Gulf of Mexico.    |
| 6  | The Northern Gulf of Mexico is a               |
| 7  | little bit of a larger offshore model that's   |
| 8  | going to allow us to do smaller nested models  |
| 9  | for Mobile and Pascagoula and Gulf Port and    |
| 10 | Lake Charles, and some of the other smaller    |
| 11 | estuaries in there. And so these are the next  |
| 12 | models that will be worked on and rolled out   |
| 13 | in FY '11 or '12.                              |
| 14 | Okay. Next slide.                              |
| 15 | So our last programmatic area is               |
| 16 | Coastal. And really the first two programs     |
| 17 | are focused on kind of, you know I'll say our  |
| 18 | foundational core supporting Commerce mission. |
| 19 | But Coastal is all the non-navigation stuff,   |
| 20 | and it's a pretty diverse portfolio. So        |
| 21 | there's three subthemes underneath there.      |
| 22 | One of these is the Coastal                    |

|    | Page 258                                       |
|----|--|
| 1  | hazards. Again, our gauges provide real-time   |
| 2  | data to the Tsunami Warning Center. It         |
| 3  | actually, it provides high resolution date,    |
| 4  | one minute data to the Tsunami Warning Center. |
| 5  | Because they need to be able to see that       |
| 6  | tsunami signal really well.                    |
| 7  | I went to the Pacific Tsunami                  |
| 8  | Center yesterday with Dave Kennedy and also    |
| 9  | met with the Navy yesterday. And they both     |
| 10 | remarked upon usefulness of this because, you  |
| 11 | know once that earthquake happens and once     |
| 12 | they get the initial seismic readings they     |
| 13 | start generating models and running models to  |
| 14 | issue forecasts. And it's when it starts       |
| 15 | hitting the tide gauges that they start to see |
| 16 | how well they've done. And when you start      |
| 17 | seeing these readings from our gauges out in   |
| 18 | Wake Island and Midway Island and some of the  |
| 19 | other places, they knew they had got it right  |
| 20 | on, you know. That gave them a large comfort   |
| 21 | level in terms of did they have to do things   |
| 22 | with the fleet to move it out of harm's way.   |

| Page 2551The Pacific Tsunami Warning Center to tell the2State of Hawaii, yes, we're on. You can make3your evacuation plans accordingly. So a lot4of value to that information.5And the corollary is the other6type of hazard is, you know, big storms,7whether it's a hurricane or a typhoon or a big8tropical storm we provide that real-time data9to the Weather Service and emergency10responders because it tells them what's going11on at that location in terms of storm surge.12We also issue, it's a specialized13product called a Storm Quicklook product which14is a synoptic at all the water levels that are15being affected by a particular storm. You16know, last season was a pretty quite season in17the U.S., although it was predicted to be18above average. Like, they're saying this next19season is going to be above average and we'll20Just to see.21So, we didn't have a lot to do |    |  |
|--|----|--|
| State of Hawaii, yes, we're on. You can make<br>your evacuation plans accordingly. So a lot<br>of value to that information. And the corollary is the other<br>type of hazard is, you know, big storms,<br>whether it's a hurricane or a typhoon or a big<br>tropical storm we provide that real-time data<br>to the Weather Service and emergency<br>responders because it tells them what's going<br>on at that location in terms of storm surge. We also issue, it's a specialized<br>product called a Storm Quicklook product which<br>is a synoptic at all the water levels that are<br>being affected by a particular storm. You<br>know, last season was a pretty quite season in<br>the U.S., although it was predicted to be<br>above average. Like, they're saying this next<br>season is going to be above average and we'll<br>just to see.  |    | Page 259                                       |
| your evacuation plans accordingly. So a lot<br>of value to that information. And the corollary is the other type of hazard is, you know, big storms, whether it's a hurricane or a typhoon or a big<br>tropical storm we provide that real-time data<br>to the Weather Service and emergency responders because it tells them what's going<br>on at that location in terms of storm surge. We also issue, it's a specialized<br>product called a Storm Quicklook product which<br>is a synoptic at all the water levels that are<br>being affected by a particular storm. You<br>know, last season was a pretty quite season in<br>the U.S., although it was predicted to be<br>above average. Like, they're saying this next<br>season is going to be above average and we'll<br>just to see.   | 1  | The Pacific Tsunami Warning Center to tell the |
| 4of value to that information.5And the corollary is the other6type of hazard is, you know, big storms,7whether it's a hurricane or a typhoon or a big8tropical storm we provide that real-time data9to the Weather Service and emergency10responders because it tells them what's going11on at that location in terms of storm surge.12We also issue, it's a specialized13product called a Storm Quicklook product which14is a synoptic at all the water levels that are15being affected by a particular storm. You16know, last season was a pretty quite season in17the U.S., although it was predicted to be18above average. Like, they're saying this next19season is going to be above average and we'll20just to see.   | 2  | State of Hawaii, yes, we're on. You can make   |
| 5And the corollary is the other6type of hazard is, you know, big storms,7whether it's a hurricane or a typhoon or a big8tropical storm we provide that real-time data9to the Weather Service and emergency10responders because it tells them what's going11on at that location in terms of storm surge.12We also issue, it's a specialized13product called a Storm Quicklook product which14is a synoptic at all the water levels that are15being affected by a particular storm. You16know, last season was a pretty quite season in17the U.S., although it was predicted to be18above average. Like, they're saying this next19season is going to be above average and we'll20just to see.   | 3  | your evacuation plans accordingly. So a lot    |
| type of hazard is, you know, big storms,<br>whether it's a hurricane or a typhoon or a big<br>tropical storm we provide that real-time data<br>to the Weather Service and emergency<br>responders because it tells them what's going<br>on at that location in terms of storm surge.<br>We also issue, it's a specialized<br>product called a Storm Quicklook product which<br>is a synoptic at all the water levels that are<br>being affected by a particular storm. You<br>know, last season was a pretty quite season in<br>the U.S., although it was predicted to be<br>above average. Like, they're saying this next<br>season is going to be above average and we'll<br>just to see.  | 4  | of value to that information.                  |
| 7 whether it's a hurricane or a typhoon or a big<br>8 tropical storm we provide that real-time data<br>9 to the Weather Service and emergency<br>10 responders because it tells them what's going<br>11 on at that location in terms of storm surge.<br>12 We also issue, it's a specialized<br>13 product called a Storm Quicklook product which<br>14 is a synoptic at all the water levels that are<br>15 being affected by a particular storm. You<br>16 know, last season was a pretty quite season in<br>17 the U.S., although it was predicted to be<br>18 above average. Like, they're saying this next<br>19 season is going to be above average and we'll<br>20 just to see.   | 5  | And the corollary is the other                 |
| 8 tropical storm we provide that real-time data<br>9 to the Weather Service and emergency<br>10 responders because it tells them what's going<br>11 on at that location in terms of storm surge.<br>12 We also issue, it's a specialized<br>13 product called a Storm Quicklook product which<br>14 is a synoptic at all the water levels that are<br>15 being affected by a particular storm. You<br>16 know, last season was a pretty quite season in<br>17 the U.S., although it was predicted to be<br>18 above average. Like, they're saying this next<br>19 season is going to be above average and we'll<br>20 just to see.   | 6  | type of hazard is, you know, big storms,       |
| <ul> <li>y to the Weather Service and emergency</li> <li>responders because it tells them what's going</li> <li>on at that location in terms of storm surge.</li> <li>We also issue, it's a specialized</li> <li>product called a Storm Quicklook product which</li> <li>is a synoptic at all the water levels that are</li> <li>being affected by a particular storm. You</li> <li>know, last season was a pretty quite season in</li> <li>the U.S., although it was predicted to be</li> <li>above average. Like, they're saying this next</li> <li>season is going to be above average and we'll</li> <li>just to see.</li> </ul>   | 7  | whether it's a hurricane or a typhoon or a big |
| 10 responders because it tells them what's going<br>11 on at that location in terms of storm surge.<br>12 We also issue, it's a specialized<br>13 product called a Storm Quicklook product which<br>14 is a synoptic at all the water levels that are<br>15 being affected by a particular storm. You<br>16 know, last season was a pretty quite season in<br>17 the U.S., although it was predicted to be<br>18 above average. Like, they're saying this next<br>19 season is going to be above average and we'll<br>20 just to see.  | 8  | tropical storm we provide that real-time data  |
| 11 on at that location in terms of storm surge.<br>12 We also issue, it's a specialized<br>13 product called a Storm Quicklook product which<br>14 is a synoptic at all the water levels that are<br>15 being affected by a particular storm. You<br>16 know, last season was a pretty quite season in<br>17 the U.S., although it was predicted to be<br>18 above average. Like, they're saying this next<br>19 season is going to be above average and we'll<br>20 just to see.  | 9  | to the Weather Service and emergency           |
| We also issue, it's a specialized<br>product called a Storm Quicklook product which<br>is a synoptic at all the water levels that are<br>being affected by a particular storm. You<br>know, last season was a pretty quite season in<br>the U.S., although it was predicted to be<br>above average. Like, they're saying this next<br>season is going to be above average and we'll<br>just to see.  | 10 | responders because it tells them what's going  |
| 13 product called a Storm Quicklook product which<br>14 is a synoptic at all the water levels that are<br>15 being affected by a particular storm. You<br>16 know, last season was a pretty quite season in<br>17 the U.S., although it was predicted to be<br>18 above average. Like, they're saying this next<br>19 season is going to be above average and we'll<br>20 just to see.   | 11 | on at that location in terms of storm surge.   |
| 14 is a synoptic at all the water levels that are<br>15 being affected by a particular storm. You<br>16 know, last season was a pretty quite season in<br>17 the U.S., although it was predicted to be<br>18 above average. Like, they're saying this next<br>19 season is going to be above average and we'll<br>20 just to see.  | 12 | We also issue, it's a specialized              |
| 15 being affected by a particular storm. You<br>16 know, last season was a pretty quite season in<br>17 the U.S., although it was predicted to be<br>18 above average. Like, they're saying this next<br>19 season is going to be above average and we'll<br>20 just to see.   | 13 | product called a Storm Quicklook product which |
| 16 know, last season was a pretty quite season in<br>17 the U.S., although it was predicted to be<br>18 above average. Like, they're saying this next<br>19 season is going to be above average and we'll<br>20 just to see.   | 14 | is a synoptic at all the water levels that are |
| 17 the U.S., although it was predicted to be<br>18 above average. Like, they're saying this next<br>19 season is going to be above average and we'll<br>20 just to see.  | 15 | being affected by a particular storm. You      |
| 18 above average. Like, they're saying this next<br>19 season is going to be above average and we'll<br>20 just to see.  | 16 | know, last season was a pretty quite season in |
| <pre>19 season is going to be above average and we'll 20 just to see.</pre>  | 17 | the U.S., although it was predicted to be      |
| 20 just to see.  | 18 | above average. Like, they're saying this next  |
|  | 19 | season is going to be above average and we'll  |
| 21 So, we didn't have a lot to do  | 20 | just to see.                                   |
|  | 21 | So, we didn't have a lot to do                 |
| 22 this last year. But we did work with the  | 22 | this last year. But we did work with the       |

|    | Page 260                                       |
|----|--|
| 1  | Weather Service to integrate a lot of our      |
| 2  | information directly into their SLOSH model.   |
| 3  | That's their storm surge forecast model. Up    |
| 4  | until last year they had to run their model    |
| 5  | and kind of look at all of our information     |
| 6  | separately in terms of using it as input to    |
| 7  | the model or to validate what the model was    |
| 8  | saying. Now within that model they can         |
| 9  | actually pull up screens and do specialized    |
| 10 | displays of our information. So it's all there |
| 11 | in one place.                                  |
| 12 | Okay. Future outlook.                          |
| 13 | Last year we got an earmark to do              |
| 14 | a storm surge project, to do storm surge       |
| 15 | gauges down in Mobile Bay. Mobile had gotten   |
| 16 | a PORTS system a number of years ago and they  |
| 17 | were really quite happy with that in terms of  |
| 18 | supporting safe navigation, but they also saw  |
| 19 | that it helped support evacuation decisions in |
| 20 | terms of when a storm was coming through. But  |
| 21 | the PORTS system only went up so far in the    |
| 22 | bay because that's as far as the marine        |

|    | Page 261                                       |
|----|--|
| 1  | commerce went, but they had a lot of flooding  |
| 2  | issues up in the northern of the bay so they   |
| 3  | wanted more gauges up in the northern part.    |
| 4  | So we're putting in those gauges for them.     |
| 5  | They're being integrated into the PORTS system |
| б  | as a delivery system even though               |
| 7  | programmatically they're be, I'll say, kept    |
| 8  | separate. So that's going to be completed this |
| 9  | year.  |
| 10 | Next slide.                                    |
| 11 | So another subtheme under Coastal              |
| 12 | is ecosystem management. You know, we've done  |
| 13 | a lot of work with folks at Habitat            |
| 14 | Restoration and those sorts of things, but     |
| 15 | probably the biggest thing we did this last    |
| 16 | year is up until 2010 we operated a harmful    |
| 17 | algal bloom forecast model off the West Coast  |
| 18 | of Florida. But there was some funding         |
| 19 | received in 2010 to start expanding that       |
| 20 | system to other places and we were able to     |
| 21 | transition into our operational environment    |
| 22 | the HAB forecast system that was developed for |

|    | Page 262                                       |
|----|--|
| 1  | off the coast of Texas. So that was            |
| 2  | operationalized.                               |
| 3  | Okay. Next button there.                       |
| 4  | And so the next place we're going              |
| 5  | to up in the Great Lakes they have some HAB    |
| 6  | issues up there. There's already been a model  |
| 7  | that's been developed by the Glor Lab that is  |
| 8  | kind of right for transition, so we're working |
| 9  | with bringing that one into the fold next.     |
| 10 | Oh, too quick there.                           |
| 11 | And then just in general we've                 |
| 12 | been doing a lot of water level support for    |
| 13 | the National Estuarine Research Reserve System |
| 14 | for a variety of things. For storm surge, for  |
| 15 | habitat restoration. But kind of the big       |
| 16 | thing now is a reserve to try to become        |
| 17 | sentinel sites. There's that word "sentinel"   |
| 18 | again but different meaning in terms of        |
| 19 | climate change. And so we're looking how to    |
| 20 | maybe refocus some of our efforts to help      |
| 21 | provide some that spatial foundation they'll   |
| 22 | need to help support some of that work.        |

|    | Page 263                                       |
|----|--|
| 1  | Next. Okay. Last programmatic                  |
| 2  | slide.   |
| 3  | So the last subtheme under Coastal             |
| 4  | is climate change. You know, CO-OPS is the     |
| 5  | legal authority for defining local mean sea    |
| 6  | level in the U.S. and we provide long term sea |
| 7  | level trends domestically from our network     |
| 8  | gauges, some of which go back over 150 years   |
| 9  | in the data record. We also bring in data      |
| 10 | records from global stations and put that      |
| 11 | information in as well, we continue to do      |
| 12 | that.  |
| 13 | About every five years or so we                |
| 14 | put out a hard copy publication that puts out  |
| 15 | some of this information in a bit more detail  |
| 16 | in a hard copy publication which we put out    |
| 17 | recently.                                      |
| 18 | And we've worked with the U.S.                 |
| 19 | Corps of Engineers. Not just on, you know      |
| 20 | getting them to convert this tide stations or  |
| 21 | enabling them to put their tide stations on    |
| 22 | NOAA time datums, but also any coastal project |

|    | Page 264                                       |
|----|--|
| 1  | they're going to do now is going to somehow    |
| 2  | take into account sea level trends. And we     |
| 3  | worked with them to publish their initial      |
| 4  | document. And the way the Corps works, is      |
| 5  | they put out an initial document with a new    |
| б  | policy and then they kind of road test it for  |
| 7  | a couple of years, and then they take feedback |
| 8  | on how well it worked or didn't worked, and    |
| 9  | they put out a final document.                 |
| 10 | So we worked with them very                    |
| 11 | closely on that initial document, which was    |
| 12 | put out. And now we're working with them and   |
| 13 | helping them finalize their final document.    |
| 14 | Next click. There we go.                       |
| 15 | And even though we're primarily                |
| 16 | focused on domestic activities, we got a State |
| 17 | Department grant a year or so ago to put a     |
| 18 | tide station out in Barbuda, a Caribbean       |
| 19 | island. And the Caribbeans try to get          |
| 20 | together and establish a water level network   |
| 21 | to, I'll say NOAA standards, in terms of being |
| 22 | able to use it not just for sea level rise or  |

|    | Page 265  |
|----|---|
| 1  | tsunami detection, but also for navigation      |
| 2  | uses and all those sorts of things. So we're    |
| 3  | helping them establish a station in Barbuda     |
| 4  | which they can then use to kind of gain         |
| 5  | expertise with and then transfer that           |
| 6  | expertise to other Caribbean stations. So       |
| 7  | that station should be up and running in the    |
| 8  | next couple of months.                          |
| 9  | Next slide. Okay.                               |
| 10 | So that was all the programmatic                |
| 11 | stuff. Here's the budget slide. In 2010 we      |
| 12 | got almost \$34 million, about \$3.8 million of |
| 13 | that was congressional add-on to provide O&M    |
| 14 | costs or funding for the 20 PORTS systems,      |
| 15 | capital PORTS system that were in operation     |
| 16 | around the coast. This was actually the third   |
| 17 | year that Congress had provided PORTS O&M       |
| 18 | funding. It kept kind of going up a little      |
| 19 | each year, but this is the high watermark, I    |
| 20 | think. And it was also this coastal tidal       |
| 21 | gauges earmark that was in 2010.                |
| 22 | But then you can kind of ignore                 |

| Page 2661that 2011 number, because we haven't gotten2that number yet. But, again, I think one3thing I can say it's not going to include that4PORTS 0&M funding and it's not going to5include that earmark. Because that was the6first guidance that was provided was all those7things kind of, you know get dropped out.8And then in 2012 that's the number9that's out there as part of the President's10budget. You know, as both John and Dave had11said, you know kind of the starting point of12'12 is not so much the President's budget,13it's what we got in '11. But I will say the14'12 number is everybody took a reduction15already in terms of Paul, what's the term?16Governmental accountability and what was that17term that as applied to that administrative18cut that everybody efficiency and19MR. ERADLEY: Yes. Yes.20MR. EDWING: Anyway, everybody21LOK a cut to their program to find  |    |  |
|--|----|--|
| 2that number yet. But, again, I think one3thing I can say it's not going to include that4PORTS 0&M funding and it's not going to5include that earmark. Because that was the6first guidance that was provided was all those7things kind of, you know get dropped out.8And then in 2012 that's the number9that's out there as part of the President's10budget. You know, as both John and Dave had11said, you know kind of the starting point of12'12 is not so much the President's budget,13it's what we got in '11. But I will say the14'12 number is everybody took a reduction15already in terms of Paul, what's the term?16Governmental accountability and what was that17term that as applied to that administrative18cut that everybody efficiency and19accountability?20MR. BRADLEY: Yes. Yes.21MR. EDWING: Anyway, everybody   |    | Page 266                                       |
| <ul> <li>thing I can say it's not going to include that</li> <li>PORTS O&amp;M funding and it's not going to</li> <li>include that earmark. Because that was the</li> <li>first guidance that was provided was all those</li> <li>things kind of, you know get dropped out.</li> <li>And then in 2012 that's the number</li> <li>that's out there as part of the President's</li> <li>budget. You know, as both John and Dave had</li> <li>said, you know kind of the starting point of</li> <li>'12 is not so much the President's budget,</li> <li>it's what we got in '11. But I will say the</li> <li>'12 number is everybody took a reduction</li> <li>already in terms of Paul, what's the term?</li> <li>Governmental accountability and what was that</li> <li>term that as applied to that administrative</li> <li>cut that everybody efficiency and</li> <li>accountability?</li> <li>MR. ERADLEY: Yes. Yes.</li> <li>MR. EDWING: Anyway, everybody</li> </ul> | 1  | that 2011 number, because we haven't gotten    |
| <ul> <li>PORTS O&amp;M funding and it's not going to</li> <li>include that earmark. Because that was the</li> <li>first guidance that was provided was all those</li> <li>things kind of, you know get dropped out.</li> <li>And then in 2012 that's the number</li> <li>that's out there as part of the President's</li> <li>budget. You know, as both John and Dave had</li> <li>said, you know kind of the starting point of</li> <li>'12 is not so much the President's budget,</li> <li>it's what we got in '11. But I will say the</li> <li>'12 number is everybody took a reduction</li> <li>already in terms of Paul, what's the term?</li> <li>Governmental accountability and what was that</li> <li>term that as applied to that administrative</li> <li>cut that everybody efficiency and</li> <li>accountability?</li> <li>MR. ERADLEY: Yes. Yes.</li> <li>MR. EDWING: Anyway, everybody</li> </ul>   | 2  | that number yet. But, again, I think one       |
| <ul> <li>include that earmark. Because that was the</li> <li>first guidance that was provided was all those</li> <li>things kind of, you know get dropped out.</li> <li>And then in 2012 that's the number</li> <li>that's out there as part of the President's</li> <li>budget. You know, as both John and Dave had</li> <li>said, you know kind of the starting point of</li> <li>'12 is not so much the President's budget,</li> <li>it's what we got in '11. But I will say the</li> <li>'12 number is everybody took a reduction</li> <li>already in terms of Paul, what's the term?</li> <li>Governmental accountability and what was that</li> <li>term that as applied to that administrative</li> <li>cut that everybody efficiency and</li> <li>accountability?</li> <li>MR. ERADLEY: Yes. Yes.</li> <li>MR. EDWING: Anyway, everybody</li> </ul>  | 3  | thing I can say it's not going to include that |
| <ul> <li>first guidance that was provided was all those</li> <li>things kind of, you know get dropped out.</li> <li>And then in 2012 that's the number</li> <li>that's out there as part of the President's</li> <li>budget. You know, as both John and Dave had</li> <li>said, you know kind of the starting point of</li> <li>'12 is not so much the President's budget,</li> <li>it's what we got in '11. But I will say the</li> <li>'12 number is everybody took a reduction</li> <li>already in terms of Paul, what's the term?</li> <li>Governmental accountability and what was that</li> <li>term that as applied to that administrative</li> <li>cut that everybody efficiency and</li> <li>accountability?</li> <li>MR. BRADLEY: Yes. Yes.</li> <li>MR. EDWING: Anyway, everybody</li> </ul>  | 4  | PORTS O&M funding and it's not going to        |
| <ul> <li>things kind of, you know get dropped out.</li> <li>And then in 2012 that's the number</li> <li>that's out there as part of the President's</li> <li>budget. You know, as both John and Dave had</li> <li>said, you know kind of the starting point of</li> <li>'12 is not so much the President's budget,</li> <li>it's what we got in '11. But I will say the</li> <li>'12 number is everybody took a reduction</li> <li>already in terms of Paul, what's the term?</li> <li>Governmental accountability and what was that</li> <li>term that as applied to that administrative</li> <li>cut that everybody efficiency and</li> <li>accountability?</li> <li>MR. BRADLEY: Yes. Yes.</li> <li>MR. EDWING: Anyway, everybody</li> </ul>  | 5  | include that earmark. Because that was the     |
| 8And then in 2012 that's the number9that's out there as part of the President's10budget. You know, as both John and Dave had11said, you know kind of the starting point of12'12 is not so much the President's budget,13it's what we got in '11. But I will say the14'12 number is everybody took a reduction15already in terms of Paul, what's the term?16Governmental accountability and what was that17term that as applied to that administrative18cut that everybody efficiency and19accountability?20MR. BRADLEY: Yes. Yes.21MR. EDWING: Anyway, everybody   | 6  | first guidance that was provided was all those |
| <ul> <li>that's out there as part of the President's</li> <li>budget. You know, as both John and Dave had</li> <li>said, you know kind of the starting point of</li> <li>'12 is not so much the President's budget,</li> <li>it's what we got in '11. But I will say the</li> <li>'12 number is everybody took a reduction</li> <li>already in terms of Paul, what's the term?</li> <li>Governmental accountability and what was that</li> <li>term that as applied to that administrative</li> <li>cut that everybody efficiency and</li> <li>accountability?</li> <li>MR. BRADLEY: Yes. Yes.</li> <li>MR. EDWING: Anyway, everybody</li> </ul>   | 7  | things kind of, you know get dropped out.      |
| <ul> <li>budget. You know, as both John and Dave had</li> <li>said, you know kind of the starting point of</li> <li>'12 is not so much the President's budget,</li> <li>it's what we got in '11. But I will say the</li> <li>'12 number is everybody took a reduction</li> <li>already in terms of Paul, what's the term?</li> <li>Governmental accountability and what was that</li> <li>term that as applied to that administrative</li> <li>cut that everybody efficiency and</li> <li>accountability?</li> <li>MR. BRADLEY: Yes. Yes.</li> <li>MR. EDWING: Anyway, everybody</li> </ul>  | 8  | And then in 2012 that's the number             |
| 11 said, you know kind of the starting point of<br>12 '12 is not so much the President's budget,<br>13 it's what we got in '11. But I will say the<br>14 '12 number is everybody took a reduction<br>15 already in terms of Paul, what's the term?<br>16 Governmental accountability and what was that<br>17 term that as applied to that administrative<br>18 cut that everybody efficiency and<br>19 accountability?<br>20 MR. BRADLEY: Yes. Yes.<br>21 MR. EDWING: Anyway, everybody  | 9  | that's out there as part of the President's    |
| <ul> <li>12 '12 is not so much the President's budget,</li> <li>13 it's what we got in '11. But I will say the</li> <li>14 '12 number is everybody took a reduction</li> <li>15 already in terms of Paul, what's the term?</li> <li>16 Governmental accountability and what was that</li> <li>17 term that as applied to that administrative</li> <li>18 cut that everybody efficiency and</li> <li>19 accountability?</li> <li>20 MR. BRADLEY: Yes. Yes.</li> <li>21 MR. EDWING: Anyway, everybody</li> </ul>   | 10 | budget. You know, as both John and Dave had    |
| <ul> <li>13 it's what we got in '11. But I will say the</li> <li>14 '12 number is everybody took a reduction</li> <li>15 already in terms of Paul, what's the term?</li> <li>16 Governmental accountability and what was that</li> <li>17 term that as applied to that administrative</li> <li>18 cut that everybody efficiency and</li> <li>19 accountability?</li> <li>20 MR. BRADLEY: Yes. Yes.</li> <li>21 MR. EDWING: Anyway, everybody</li> </ul>  | 11 | said, you know kind of the starting point of   |
| <ul> <li>14 '12 number is everybody took a reduction</li> <li>15 already in terms of Paul, what's the term?</li> <li>16 Governmental accountability and what was that</li> <li>17 term that as applied to that administrative</li> <li>18 cut that everybody efficiency and</li> <li>19 accountability?</li> <li>20 MR. BRADLEY: Yes. Yes.</li> <li>21 MR. EDWING: Anyway, everybody</li> </ul>  | 12 | '12 is not so much the President's budget,     |
| <pre>15 already in terms of Paul, what's the term?<br/>16 Governmental accountability and what was that<br/>17 term that as applied to that administrative<br/>18 cut that everybody efficiency and<br/>19 accountability?<br/>20 MR. BRADLEY: Yes. Yes.<br/>21 MR. EDWING: Anyway, everybody</pre>  | 13 | it's what we got in '11. But I will say the    |
| 16 Governmental accountability and what was that<br>17 term that as applied to that administrative<br>18 cut that everybody efficiency and<br>19 accountability?<br>20 MR. BRADLEY: Yes. Yes.<br>21 MR. EDWING: Anyway, everybody  | 14 | '12 number is everybody took a reduction       |
| <pre>17 term that as applied to that administrative<br/>18 cut that everybody efficiency and<br/>19 accountability?<br/>20 MR. BRADLEY: Yes. Yes.<br/>21 MR. EDWING: Anyway, everybody</pre>   | 15 | already in terms of Paul, what's the term?     |
| <pre>18 cut that everybody efficiency and<br/>19 accountability?<br/>20 MR. BRADLEY: Yes. Yes.<br/>21 MR. EDWING: Anyway, everybody</pre>  | 16 | Governmental accountability and what was that  |
| <pre>19 accountability? 20 MR. BRADLEY: Yes. Yes. 21 MR. EDWING: Anyway, everybody</pre>   | 17 | term that as applied to that administrative    |
| 20 MR. BRADLEY: Yes. Yes.<br>21 MR. EDWING: Anyway, everybody  | 18 | cut that everybody efficiency and              |
| 21 MR. EDWING: Anyway, everybody   | 19 | accountability?                                |
|  | 20 | MR. BRADLEY: Yes. Yes.                         |
| 22 took a cut to their program to find   | 21 | MR. EDWING: Anyway, everybody                  |
|  | 22 | took a cut to their program to find            |

|    | Page 267                                       |
|----|--|
| 1  | administrative efficiencies. But on top of     |
| 2  | that cost proposed another reduction because   |
| 3  | of completing the sensor upgrades as well as   |
| 4  | it also took the hardening money out of the    |
| 5  | budget. Those two things were taken out of     |
| 6  | the budget for CO-OPS in 2012. So we're about  |
| 7  | a million dollars under what would have been   |
| 8  | the '11 budget.                                |
| 9  | Last slide, which is the                       |
| 10 | performance metrics. This is the high level    |
| 11 | performance metric that we feed up into and    |
| 12 | this is really across tri-office performance   |
| 13 | metric. It's a percent of the top 175 U.S.     |
| 14 | seaports with access to the full suite of our  |
| 15 | products and services. And there's about six   |
| 16 | or seven things that feed into this.           |
| 17 | It's whether a port has an up to               |
| 18 | date ENC, whether it's got up to date          |
| 19 | shoreline, it's got the VDatum model, has the  |
| 20 | ENC been validated recently by NOT, does it    |
| 21 | have update tidal current predictions, does it |
| 22 | have real-time data as supplied by PORTS.      |

|    | Page 268                                       |
|----|--|
| 1  | There's a number of things that feed up into   |
| 2  | there. And CO-OPS, you know feeds the PORTS    |
| 3  | and the tidal current prediction information   |
| 4  | up into that.                                  |
| 5  | Hit the button again.                          |
| 6  | And then just some of the                      |
| 7  | milestones that we set for 2011. And you've    |
| 8  | seen some of these already in my presentation. |
| 9  | I think maybe the only one that wasn't in      |
| 10 | there was that very last one on the bottom     |
| 11 | right hand side is we've been trying to get    |
| 12 | prepared for doing more water level            |
| 13 | measurements up in Alaska, which is a very     |
| 14 | challenging environment, particularly north of |
| 15 | Aleutians. We can establish water levels,      |
| 16 | long term water level stations pretty well and |
| 17 | keep them going from the Aleutians south. We   |
| 18 | have about 29 stations right now in Alaska, 24 |
| 19 | of those are in the Aleutians or in southeast  |
| 20 | Alaska. Only five are up north. And there's    |
| 21 | just huge gaps in the geospatial information   |
| 22 | up there. We've been looking for ways to put   |

|    | Page 269                                      |
|----|---|
| 1  | gauges out under the ice and being able to    |
| 2  | collect data. And we were actually able to    |
| 3  | collect, without getting into a lot details,  |
| 4  | two years of data under the ice up at Barrow  |
| 5  | and bring it back and use it.                 |
| б  | So, I mean that's maybe a method              |
| 7  | that we do some long term measurements up in  |
| 8  | some of these more hostile areas. So we'll be |
| 9  | doing a technical report on that and getting  |
| 10 | it out by the end of the fiscal year.         |
| 11 | So, last slide.                               |
| 12 | A little cartoon that came out                |
| 13 | recently.                                     |
| 14 | CHAIR WELCH: Okay. Thanks, Rich.              |
| 15 | And do we have comments or questions?         |
| 16 | MEMBER MILLER: I have a question.             |
| 17 | CHAIR WELCH: Joyce?                           |
| 18 | MEMBER MILLER: Joyce Miller.                  |
| 19 | A Pacific-centered question. The              |
| 20 | infrastructure out here, I've done a fair     |
| 21 | amount of mapping out in the sea in Guam and  |
| 22 | the tide gauges are few and far between.      |

Page 270 Right. Right. 1 MR. EDWING: 2 MEMBER MILLER: Is there any --3 you know, what's the outlook for Hawaii and Pacific for infrastructure? Is there any 4 5 intent to try to upgrade or put more tide gauges in, or sort of what's planned for the 6 7 Pacific over the next X number of years? 8 MR. EDWING: Yes. There's no real 9 plan to put more in. We've done a number of 10 things over the last few years to -- again, it wasn't so much hardening, but in a lot of 11 12 these places which are very remote and hard to get to, we put in almost a second tide station 13 14 to get that redundancy. It was mainly for the long term sea level rise and some of the 15 16 tsunami sort of aspects. 17 You know, if a tide gauge has a catastrophic failure, it took us months 18 19 sometimes to get out there to fix it and by 20 then you've suffered a big blow to that data 21 record. Well, we've put in a second, almost 22 a whole second redundant system to try to get

|    | Page   | 271 |
|----|--|-----|
| 1  | around that. So, but really there's no plans.  |     |
| 2  | In terms of supporting the                     |     |
| 3  | navigation mission, at least in terms of the   |     |
| 4  | islands, we're pretty well covered, at least   |     |
| 5  | in terms of the main populated islands, let me |     |
| 6  | put it that way.                               |     |
| 7  | We used to have a gauge on                     |     |
| 8  | Johnston Island. In fact, when the military    |     |
| 9  | was there. But we had to abandon that gauge    |     |
| 10 | back when the military abandoned the site and  |     |
| 11 | I think it's just a big park now.              |     |
| 12 | So we've done a lot of things to               |     |
| 13 | strengthen the existing tide gauges, but       |     |
| 14 | there's really nothing planned in terms of     |     |
| 15 | putting more and more gauges in.               |     |
| 16 | CHAIR WELCH: David?                            |     |
| 17 | MEMBER JAY: The sort of the                    |     |
| 18 | problem with the sea level, and there are a    |     |
| 19 | lot of them. There's the tide side, there's    |     |
| 20 | the surge side and then there's the wave side. |     |
| 21 | You're not really into the wave prediction.    |     |
| 22 | MR. EDWING: No.                                |     |

|    | Page 272                                      |
|----|---|
| 1  | MEMBER JAY. I don't know if                   |
| 2  | there's anybody doing a systematic effort.    |
| 3  | But it seemed to be a pretty important that   |
| 4  | isn't very well vetted.                       |
| 5  | MR. EDWING: Well, we've got NDBC              |
| б  | which has the buoy network, which is well     |
| 7  | offshore and that's one of their parameters   |
| 8  | that they're bringing in. But there's a big   |
| 9  | gap between what NDBC is doing offshore and   |
| 10 | closer in.                                    |
| 11 | Now the Corps has a small wave                |
| 12 | network, CDIP. I forget what the acronym      |
| 13 | stands for. But that was how we actually met  |
| 14 | our PORTS requirement for waves, was we're    |
| 15 | integrating the data from those wave buoys    |
| 16 | where they're co-located with a PORTS system. |
| 17 | But the Corps is the best source right now in |
| 18 | terms of that near shore wave information.    |
| 19 | CHAIR WELCH: Gary?                            |
| 20 | MEMBER JEFFRESS: I believe I can              |
| 21 | announce that TCOON has just been shortlisted |
| 22 | by the State of Texas to receive a grant on   |

| Page 273                                       |
|--|
| the Coastal Impact and Assessment Program,     |
| which is from the Bureau of Ocean Energy       |
| Management, Regulation and Enforcement to put  |
| three more Sentinels in Texas to cover the     |
| middle and south coast.                        |
| CHAIR WELCH: Sherri?                           |
| MEMBER HICKMAN: The new storm                  |
| surge relief in Mobile is Sentinel?            |
| MR. EDWING: The tide gauges, yes.              |
| MEMBER HICKMAN: Okay. Who is                   |
| paying the                                     |
| MR. EDWING: This is Mobile County              |
| Commission that's our partner on this.         |
| MEMBER HICKMAN: And is that the                |
| case for the PORTS program itself?             |
| MR. EDWING: No, no, no. It's two               |
| different partners for two different purposes. |
| We're just using the PORTS dissemination page  |
| to get the data out to everybody and           |
| everybody's agreed to that. But the PORTS      |
| partner is not picking up the O&M for the      |
| storm surge gauges.                            |
|  |

|    | Page 274                                      |
|----|---|
| 1  | MEMBER HICKMAN: Okay.                         |
| 2  | CHAIR WELCH: Okay. All right.                 |
| 3  | Well, thanks to all three of the line         |
| 4  | agencies.                                     |
| 5  | Short break, and then we'll come              |
| 6  | back to our users Panel. We're a little bit   |
| 7  | behind schedule. Let's take ten minutes.      |
| 8  | (Whereupon, the above-entitled                |
| 9  | matter went off the record at 2:43 p.m. and   |
| 10 | resumed at 3:04 p.m.)                         |
| 11 | CHAIR WELCH: Okay. We have a                  |
| 12 | couple of real quick administrative items.    |
| 13 | First, we do have this dinner                 |
| 14 | tonight, which is of course voluntary but is  |
| 15 | usually a lot of fun, the food's pretty good. |
| 16 | But Kathy needs a show of hands of everybody  |
| 17 | that's planning to be part of the group       |
| 18 | tonight so that she can make our plans. So,   |
| 19 | raise your hand now. Guests can come, too.    |
| 20 | So how many?                                  |
| 21 | MS. WATSON: Oh, about 21.                     |
| 22 | CHAIR WELCH: Okay. Now, Kathy,                |
| -  | Nool B. Grogg & Co. Ing                       |

|    | Page 275                                       |
|----|--|
| 1  | what are the logistics? Where do we meet and   |
| 2  | when do we meet and what do we do?             |
| 3  | MS. WATSON: The Agenda says we're              |
| 4  | going to meet in the lobby, actually. The      |
| 5  | main lobby.                                    |
| 6  | CHAIR WELCH: Okay. Near the                    |
| 7  | check-in place?                                |
| 8  | MS. WATSON: Yes. At 6:30. And                  |
| 9  | it's only about maybe 15 minute walk. Very     |
| 10 | nice pleasant walk.                            |
| 11 | MEMBER MILLER: And I have a car                |
| 12 | since I'm local. And some people, like         |
| 13 | Michele has a bum knee. So if anybody needs a  |
| 14 | ride or would like to ride down, I'm going to  |
| 15 | take my car anyway because I go home.          |
| 16 | MS. WATSON: And also, too, any of              |
| 17 | the speakers are more than welcome to join, or |
| 18 | any of the guests in the audience you're       |
| 19 | welcome to join also.                          |
| 20 | CHAIR WELCH: Okay. Very good.                  |
| 21 | And then a second item is that we              |
| 22 | have some paperwork we have to fill out.       |
|    |  |

|    | Page 276                                       |
|----|--|
| 1  | Where's Tiffany? Tiffany House is one of our   |
| 2  | NOAA folks.                                    |
| 3  | We have two different pieces of                |
| 4  | paper we have to fill out?                     |
| 5  | MS. HOUSE: Yes.                                |
| 6  | CHAIR WELCH: So take a look at                 |
| 7  | those forms. And if you are a little but       |
| 8  | unclear as to what you need to fill out,       |
| 9  | Tiffany will just see her.                     |
| 10 | Now you just need that before we               |
| 11 | get out of town?                               |
| 12 | MS. HOUSE: Yes.                                |
| 13 | CHAIR WELCH: Right. Okay.                      |
| 14 | Oh, one other thing. Is there                  |
| 15 | anybody here who is willing to admit this is   |
| 16 | their first time in Hawaii? Very good.         |
| 17 | Okay. Let's move on then to our                |
| 18 | first Stakeholders Panel or Users Panel. And   |
| 19 | this is where we have people that interact     |
| 20 | with NOAA or use NOAA products to tell the     |
| 21 | Panel how they use products, what value or     |
| 22 | lack of value they might have, what they might |

|    | Page 277                                       |
|----|--|
| 1  | need that isn't being offered or suggestions   |
| 2  | for improvements or enhancements.              |
| 3  | This is a portion of the program               |
| 4  | that we get a lot of value from, and we        |
| 5  | appreciate you all committing some time and    |
| 6  | some effort to be with us.                     |
| 7  | This first Panel tends to be equal             |
| 8  | or more traditional maritime users or people   |
| 9  | involved in commercial or other types of       |
| 10 | navigation.                                    |
| 11 | So what we'll do, I think, is                  |
| 12 | recognize each of you in turn and we will hold |
| 13 | our questions until our panelists all get      |
| 14 | through and then we can talk to them           |
| 15 | collectively.                                  |
| 16 | And we do have one change from our             |
| 17 | program. So we'll start with Captain Steven    |
| 18 | Baker from the Hawaiian Pilots Association.    |
| 19 | So, welcome, and the floor is yours.           |
| 20 | CAPT. BAKER: All right. Thanks.                |
| 21 | I'm the President with the Hawaii              |
| 22 | Pilots Association. And we've been providing   |
|    |  |

|    | Page 278                                      |
|----|---|
| 1  | safe efficient piloted service here to        |
| 2  | Hawaii's seven deep draft commercial ports on |
| 3  | four different islands for just over 30 years |
| 4  | now. And in 1979, like many of the coastal    |
| 5  | states, the state government decided it was   |
| 6  | best to leave state pilotage to a private     |
| 7  | entity. And prior to that we had worked for   |
| 8  | the state as state employees. And that had    |
| 9  | been going back for quite a ways. And they    |
| 10 | retrained oversight and control over the rate |
| 11 | structure like any other regulated industry.  |
| 12 | So, we've been private for a little over 30   |
| 13 | years.  |
| 14 | If you go way back, we used to use            |
| 15 | the harbor master/pilot. In some of the       |
| 16 | neighbor island ports I used to do both jobs, |
| 17 | so we don't do that anymore.                  |
| 18 | The pilots, we don't perform any              |
| 19 | piloted services for the Navy base at Pearl,  |
| 20 | but we frequently routinely pilot U.S. and    |
| 21 | foreign naval vessels that call at the        |
| 22 | commercial ports. And around the mid-1990s we |

|    | Page 279                                      |
|----|---|
| 1  | also provided piloted services at Johnston    |
| 2  | Atoll. Did that for several years.            |
| 3  | I don't know if you're familiar               |
| 4  | with that. Some folks may be. But that was    |
| 5  | being used as a disposal site for chemical    |
| 6  | weapons and they required a regular tanker to |
| 7  | go in and fill up the storage tanks they had  |
| 8  | there.  |
| 9  | It was a very interesting location            |
| 10 | and we contracted with them to provide a      |
| 11 | pilot. About every six weeks or so they had   |
| 12 | to take a tanker in. So, it was outside out   |
| 13 | of the state tariff and there wasn't a lot of |
| 14 | datum down there. We did have the tidal       |
| 15 | datum. As you mentioned, we did have a site   |
| 16 | down there at the time so we could work with  |
| 17 | that. But they had tremendous currents going  |
| 18 | through that atoll. And they were very        |
| 19 | concerned because it does border a wildlife   |
| 20 | preserve area that they didn't want to have   |
| 21 | any accidents down there. So we did agree to  |
| 22 | send a pilot down.                            |

|    | Page 280                                       |
|----|--|
| 1  | And we'd set up a daily charge.                |
| 2  | We thought it would be a great idea from the   |
| 3  | time that they're at the airport until they    |
| 4  | returned. So we would get our pilot back as    |
| 5  | soon as possible. But I didn't realize that    |
| 6  | didn't move the government very much, the      |
| 7  | Army. They would leave our guy down there for  |
| 8  | about a week at a time.                        |
| 9  | But anyway, that's all shutdown                |
| 10 | now and we concentrate just here in the ports  |
| 11 | we have in Hawaii.                             |
| 12 | We're currently comprised of ten               |
| 13 | pilots. We work a two week on, two week off    |
| 14 | schedule. We take our turn traveling to the    |
| 15 | inner island ports extensively. And we cover   |
| 16 | as many jobs as we can when it's our turn and  |
| 17 | then we fall back to two, sometimes three      |
| 18 | pilots to handle that work in the neighbor     |
| 19 | islands.                                       |
| 20 | We do heavy lift, cable layers,                |
| 21 | research vessels, passenger ships, container   |
| 22 | ships, tankers, foreign fishing vessels. We do |

Г

|    | Page 281                                       |
|----|--|
| 1  | a variety of stuff, even cattle ships were     |
| 2  | quite frequent for a while. They were          |
| 3  | shipping a lot of stuff back to Mexico and     |
| 4  | Canada, a lot of cattle out of the Big Island. |
| 5  | Most of our work is stable year                |
| 6  | round. We do experience surge periods when the |
| 7  | cruise ships are in transit to and from Alaska |
| 8  | for their summertime cruise season.            |
| 9  | Our pilots do strive to keep                   |
| 10 | trained and current with the evolving          |
| 11 | technology. And in recent years we've seen     |
| 12 | significant changes, not only in how ships are |
| 13 | navigated from the bridge but how they're      |
| 14 | maneuvered from the engine room as well.       |
| 15 | Some of the most significant                   |
| 16 | changes in the last decade include the         |
| 17 | evolution of the podded propulsion, the Azipod |
| 18 | propulsion systems which we've seen on the     |
| 19 | larger passenger vessels and some cable        |
| 20 | layers. And then the ECDIS, or electric        |
| 21 | digitized chart systems which are becoming     |
| 22 | more and more prevalent on all the vessels as  |

|    | Page 282                                       |
|----|--|
| 1  | they move from paper to electronic. And the    |
| 2  | implementation of the shipboard automatic      |
| 3  | identity systems, the AIS transponders which   |
| 4  | are now required on all the vessels.           |
| 5  | We've been active with the Coast               |
| 6  | Guard. We've partnered with them and with the  |
| 7  | Maritime Marine Exchange out of San Francisco, |
| 8  | and we do have a tracking system that goes out |
| 9  | about 100 miles all around the islands. So it  |
| 10 | allows us to track the traffic coming through. |
| 11 | It's been a very useful tool, especially for   |
| 12 | our management of just the pilot's time. And   |
| 13 | I'm sure it saved us a lot of fuel not having  |
| 14 | to send out pilot boats looking for inbounders |
| 15 | that haven't called in.                        |
| 16 | We maintain a close relationship               |
| 17 | with the American Pilots Association that we   |
| 18 | belong to. Also, the International Maritime    |
| 19 | Pilots Association. Perhaps the most           |
| 20 | important aspect of our relationship with the  |
| 21 | APA is we utilize their guidance and direction |
| 22 | to determine specific areas where we need to   |

|    | Page 283                                       |
|----|--|
| 1  | train, educate and certify ourselves with the  |
| 2  | evolving technology. And the most current      |
| 3  | example of that would be the ECDIS regulations |
| 4  | that are mandated by IMO and will go into      |
| 5  | effect here in 2012.                           |
| 6  | Some of the services that we've                |
| 7  | either utilized or that we're actually looking |
| 8  | at that we've discussed some of it with NOAA   |
| 9  | in the past would be the PORTS buoy system.    |
| 10 | We've been interested in that for several our  |
| 11 | ports.   |
| 12 | None of our pilotage areas are                 |
| 13 | long runs. Everything's fairly short. We       |
| 14 | board two or three miles offshore and the      |
| 15 | channels leading into the ports are fairly     |
| 16 | short, and the ports aren't that large. But    |
| 17 | because we're an island state in the middle of |
| 18 | the Pacific, the currents that come through    |
| 19 | the island are not as predictable and we can   |
| 20 | see a complete 180 degree change at any time,  |
| 21 | and it's not always something that we expect.  |
| 22 | We have to actually go out and look when we    |

|    | Page 284                                       |
|----|--|
| 1  | get on. We lined up for an entry to see        |
| 2  | what's going on.                               |
| 3  | The new ECDIS systems and things               |
| 4  | on board are helpful to detect what the ship's |
| 5  | doing prior to us getting on. Not all the      |
| 6  | ships have that yet, though. So a PORTS system |
| 7  | we felt would certainly help because we would  |
| 8  | know what we're going to expect when we go     |
| 9  | onboard the ships.                             |
| 10 | Some of the ships are regular                  |
| 11 | callers. We don't always catch them as far out |
| 12 | as we would like to, although the AIS tracking |
| 13 | system has helped us tremendously in that. We  |
| 14 | can see if somebody's coming up early and we   |
| 15 | get out there. But if you get on fairly close  |
| 16 | to the sea buoy, then you don't really have a  |
| 17 | lot of time to determine what the current set. |
| 18 | And sometimes if you haven't been out that     |
| 19 | day, it could be going in either direction     |
| 20 | until you get onboard and determine what it's  |
| 21 | doing.   |
| 22 | We've discussed with the Coast                 |

|    | Page 285                                       |
|----|--|
| 1  | Guard a little bit, and here recently with you |
| 2  | folks, with the aids to navigation utilizing   |
| 3  | an AIC transponder as a means of I guess a     |
| 4  | less expensive way to go into a PORTS system   |
| 5  | where we can get current tracking via an AIS   |
| 6  | transponder on a Coast Guard buoy on a channel |
| 7  | or a sea buoy. And that's just something that  |
| 8  | we're looking at. We've seen it done in some   |
| 9  | other locations, so it looks interesting.      |
| 10 | Some of the pilots have discussed              |
| 11 | ocean cams, which are closed circuit TV        |
| 12 | systems which you could utilize for some of    |
| 13 | the areas that would be helpful if we could    |
| 14 | observe them visually. And now with the new    |
| 15 | technology that's very high definition it      |
| 16 | could be useful to us. And we discussed that   |
| 17 | a little bit with the state because they are   |
| 18 | in the process of doing a statewide system.    |
| 19 | And then approved survey                       |
| 20 | capability. And some of that has already       |
| 21 | happened since we just recently had you folks  |
| 22 | out here to do the update. In the aftermath    |

|    | Page 286                                       |
|----|--|
| 1  | of the recent tsunami, local mariners had no   |
| 2  | way of accurately surveying the commercial     |
| 3  | harbor channels and basins, and this would be  |
| 4  | post-tsunami, to ensure we had safe water      |
| 5  | depth alongside the piers.                     |
| 6  | We ran our pilot boats around and              |
| 7  | did some tacit looks. We don't have side-      |
| 8  | scan, it's not a sophisticated system. But     |
| 9  | we were able to look at the main ship          |
| 10 | channels. We were able to determine if the     |
| 11 | aids were on station after the event. And all  |
| 12 | this is critical information that we need and  |
| 13 | the Coast Guard and the state requires in      |
| 14 | order to comfortably make the decision to      |
| 15 | reopen the port.                               |
| 16 | And all ports were closed for the              |
| 17 | last two tsunamis. We had to take a lot of     |
| 18 | vessels out. And the sooner we can get them    |
| 19 | back in, of course as soon as they decide it's |
| 20 | safe, the better because there's no commerce   |
| 21 | going on while everybody's sitting off port    |
| 22 | and watching us. So we felt that maybe if      |

|    | Page 287                                      |
|----|---|
| 1  | there was a dedicated NOAA survey launch for  |
| 2  | this purpose on station or available more,    |
| 3  | since we're kind of isolated out here in the  |
| 4  | islands that might be of a great help.        |
| 5  | I'm hoping we don't have regular              |
| 6  | annual tsunamis, but we never know. And we    |
| 7  | have to do the same thing after a heavy wind  |
| 8  | event. Of course if there's a cyclone, a      |
| 9  | hurricane. Or we occasionally do get surf     |
| 10 | that's of a magnitude that it does move the   |
| 11 | aids around and does create unusual currents  |
| 12 | and other havoc. And again, when you have     |
| 13 | that much water moving around it's good to be |
| 14 | able to do a survey as soon as possible to    |
| 15 | check and ensure that you've got your minimum |
| 16 | depths that you want.                         |
| 17 | This outside of our area but one              |
| 18 | that we've been concerned about because we've |
| 19 | been observing it for some time, and that's   |
| 20 | the Marine Sanctuary for the humpback whale   |
| 21 | which has established a minimum speed limit   |
| 22 | when it's in season of 13 knots. And we       |

Page 288 understand the need for that, but it is in an 1 2 area that is heavily used by our tug and barge operators, and ships, the transit here 3 particularly in between the islands. 4 5 And the way we're set up in Hawaii, as some of you are probably already 6 7 aware of, is the vast majority of the cargo 8 comes into Honolulu and then is transhipped 9 out to the neighbor island ports. We don't warehouse a lot of things here, so everybody 10 functions with their inventory on just time of 11 12 arrival. And any big interruption to that becomes very evident fairly quick in store 13 14 shelves and so forth. We'd like to suggest, also being 15 16 mariners, our experience, that there is dialogue with the marine folks, people who are 17 operating in that area, anytime they meet and 18 19 possibly discuss revamping these rules. 20 Because it impacts a lot of folks who transit 21 that area. And in the wintertime, which is 22 also during the season that the whales are
Page 289 1 here, that is a preferred routing for most 2 people because of the open ocean conditions we 3 have here during the heavy north swells and other weather that we get during that time of 4 5 year. So we felt that that's something 6 7 we wanted to mention. I know it's been a big 8 problem for operators up on the East Coast for 9 the right whale, and including the pilot boats 10 that are over 65 feet in length. And I know there's a lot of dialogue going on in there, 11 12 so we wanted to bring that -- just mention 13 that. 14 Otherwise, we certainly have been regular users of your products. We are moving 15 into the electronic age with ECDIS and 16 17 certainly have found most of what we utilize 18 here in the islands has been very helpful and 19 very accurate. With only a two foot tidal 20 range, and I know it's hard to predict 21 currents in open ocean, we don't utilize some 22 of the stuff to the extent they may in other

|    | Page 290                                       |
|----|--|
| 1  | ports on the mainland. But we appreciate it.   |
| 2  | And also appreciate our opportunity to come    |
| 3  | and speak to you folks.                        |
| 4  | Thank you very much.                           |
| 5  | CHAIR WELCH: Thank you, Captain.               |
| 6  | We will hold some questions for you and come   |
| 7  | back to you.                                   |
| 8  | So next representing Matson                    |
| 9  | Navigation Company is Captain Bob Lamb.        |
| 10 | CAPT. LAMB: Aloha.                             |
| 11 | Do you have my slide up? Okay.                 |
| 12 | Well, my name is Bob Lamb. I                   |
| 13 | graduated from Kings Point, the U.S. Merchant  |
| 14 | Marine Academy in 1976. And I started          |
| 15 | shipping in the Merchant Marine immediately    |
| 16 | and thought I would never retire from the sea. |
| 17 | I worked with U.S. Lines, Sea Land, Maersk     |
| 18 | Line and then ended up at Matson. And my last  |
| 19 | 22 years or so were as captain of merchant     |
| 20 | ships. And about a year and a half ago my      |
| 21 | boss asked me if I wanted to be the port       |
| 22 | captain here in Honolulu. And it seemed like   |

Page 291 a no-brainer, so I said yes. The wife was a 1 2 little surprised at that choice, but she's 3 happy over here now. This is one of our newer ships. 4 5 It's not one of the ones we're going to go on tomorrow. Unfortunately, these are in on 6 7 Monday and the Thursday ship is one of our 8 older ones, built in the early '80s, or so. But it still has the ECDIS onboard, so we'll 9 10 see the integrated chart systems. 11 You can see up on the top there 12 the route that our ships take. We have two 13 services that go from the West Coast to here, 14 and one that goes from the West Coast through here and Guam out to China and back to the 15 16 West Coast. 17 And Captain Steve here said, it's 18 all hub and spoke service in the islands. Our 19 ships bring the cargo into Honolulu and Guam. 20 And then in Guam we actually have a small ship 21 that we charter, The Islander, that serves all of those little neighbor islands out there. 22

Page 292 In Honolulu here we transfer everything over 1 2 to barges and Sause Bros, Brad Rimmel here tows our barges around. 3 Next slide, please. 4 But that was my history. Here's a 5 6 little history of Matson. 7 It's been around for a long time. 8 Late 1800s they started. 9 I'll just make that a quick one there. You know sails, now we're into steam 10 and motor ships. 11 12 Next slide, please. 13 CHAIR WELCH: While we're waiting, 14 Captain Tom Jacobsen, have you ever piloted Matson into L.A.? 15 16 MEMBER JACOBSEN: Yes. Long 17 I was going to say you need to correct Beach. that last slide. It should say Long Beach up 18 19 there. 20 CAPT. LAMB: Did it say Los 21 Angeles? 22 MEMBER JACOBSEN: Yes.

|    | Page 293                                       |
|----|--|
| 1  | CAPT. LAMB: Yes, this one it                   |
| 2  | does.  |
| 3  | Okay. This is from a program we                |
| 4  | use called Applied Weather Technologies.       |
| 5  | They're all over the world really, but it's    |
| 6  | for the weather guarding on ships, but I       |
| 7  | thought it was pretty germane to what I wanted |
| 8  | to talk about today.                           |
| 9  | You saw the first slide that                   |
| 10 | showed the routes that our ships might go.     |
| 11 | This will show one of our China ships is in    |
| 12 | one of our China ships is in Long Beach,       |
| 13 | the other one just left Honolulu. We have      |
| 14 | that just sailed from Guam. There's one in     |
| 15 | Shanghai just sailed from there today. And     |
| 16 | the one coming back from China is up here.     |
| 17 | So, we're on a five week service.              |
| 18 | The other ships on the coast by us run are the |
| 19 | Mokihana and the Maui. They almost collided    |
| 20 | here, the Maui heading out here and the        |
| 21 | Mokihana heading to Oakland. And the Mahi      |
| 22 | Mahi is the one we'll be on tomorrow, and      |

ſ

|    | Page 294                                      |
|----|---|
| 1  | she's coming in from Long Beach. And the      |
| 2  | Manoa, she's the one heading up to Seattle.   |
| 3  | You might notice I didn't point to            |
| 4  | all of these ships. We also have five ships   |
| 5  | that we recently chartered. They're foreign-  |
| 6  | flagged and foreign-crewed that Matson        |
| 7  | chartered. And they're going from China back  |
| 8  | to the U.S.: The Kainalu, Kaimoku, Kailua,    |
| 9  | there's one over there I can't quite see      |
| 10 | coming out of Hong Kong.                      |
| 11 | So Steve was talking about the                |
| 12 | currents in and around the ports. The thing   |
| 13 | that we're concerned about with the ships is  |
| 14 | open ocean. And I know that's hard for you to |
| 15 | do, Captain John, but that's something we     |
| 16 | would really be interested in seeing in the   |
| 17 | product would be open ocean currents.         |
| 18 | If you'd go to the next slide,                |
| 19 | please.                                       |
| 20 | It doesn't look like much. Okay.              |
| 21 | This is Wake Island. And one of our captains  |
| 22 | gets what he said was a counter-current down  |
|    |   |

|    | Page 295                                      |
|----|---|
| 1  | near Wake Island. The rest of us all kind of  |
| 2  | scoffed at him. And he swore that "No, no, my |
| 3  | ship loses at least a half a knot, maybe a    |
| 4  | knot every trip between 175 West and 175      |
| 5  | East."  |
| 6  | And this is again from Applied                |
| 7  | Weather Technologies. And this is taken off   |
| 8  | of a weather document and just looking at the |
| 9  | current feature that they have.               |
| 10 | So in this area of the ocean you              |
| 11 | would really expect a pretty steady westward  |
| 12 | flow of current. But somewhere I don't know   |
| 13 | where they get this data from, they've got    |
| 14 | arrows all over the place. Here's one coming  |
| 15 | up toward 0.40 degrees. So that's definitely  |
| 16 | not a favorable current for us. Here's here,  |
| 17 | maybe 0.70. One 1.00.                         |
| 18 | If there was some way that we                 |
| 19 | could get information like this that would    |
| 20 | quantify this and we could then, you know     |
| 21 | maybe go down and cut around this. Because    |
| 22 | when we go great circle from here to Guam, we |

|    | Page 296                                       |
|----|--|
| 1  | go actually right next to Wake Island. It's    |
| 2  | like a mile off of Wake Island when we go here |
| 3  | in a great circle. So, you know if we could    |
| 4  | avoid that by coming a little further south,   |
| 5  | or something. And I don't know if this tidal   |
| 6  | dependent even out in the middle of the ocean. |
| 7  | But information like that would be great.      |
| 8  | Virginia, next slide, please.                  |
| 9  | A lot of our captains complain,                |
| 10 | you know they're making great speed all the    |
| 11 | way out here. You all know that fuel oil is    |
| 12 | very expensive. It's just gone over \$100 a    |
| 13 | barrel. And we run, even our most modern       |
| 14 | ships burn about a barrel per mile. So a \$100 |
| 15 | per every mile that we go. And it's 2200       |
| 16 | miles from Long Beach to here. So, you do the  |
| 17 | math, that's a lot of money in fuel that we    |
| 18 | spend, and that's just one way. You know,      |
| 19 | then the ships that I retired off of we go on  |
| 20 | to Guam, that's 3300 miles. And then up to     |
| 21 | China is another 1700. And from Shanghai back  |
| 22 | to Long Beach is 5700 miles. So we use a lot   |

|    | Page 297                                       |
|----|--|
| 1  | of fuel. The fuel bill for a round trip is     |
| 2  | about a million and a half dollars. So if we   |
| 3  | can avoid currents, it is definitely to our    |
| 4  | advantage to do that.                          |
| 5  | Where I'm going with this chart is             |
| 6  | many of our captains on the domestic service - |
| 7  | - and to be honest with you, I never saw the   |
| 8  | wall they always talk about. The hidden wall   |
| 9  | that day out. And now that I'm running         |
| 10 | ashore, I think you know maybe they're just    |
| 11 | using that as an excuse to why they missed     |
| 12 | their ETA or something. But, you know if       |
| 13 | there were any information that gave currents  |
| 14 | around the islands, and you know like Steve    |
| 15 | said, he's interested in when they get close   |
| 16 | to port and obviously because he's piloting in |
| 17 | the ship in. But our main concern on the ship  |
| 18 | would be up to 300 miles to the north and east |
| 19 | of the islands when we're coming inland. That  |
| 20 | would be our main concern.                     |
| 21 | Yes, I'm a little early on the                 |
| 22 | Q&A. Sorry about that. Thank you.              |
|    |  |

|    | Page 298                                       |
|----|--|
| 1  | CHAIR WELCH: Okay. Thanks,                     |
| 2  | Captain. We'll get back to you.                |
| 3  | Mr. Robin Bond with Hawaiian Ocean             |
| 4  | Safety Team.                                   |
| 5  | MR. BOND: Thank you very much.                 |
| 6  | I hope it doesn't take as long to              |
| 7  | get up.  |
| 8  | But Hawaii Ocean Safety Team                   |
| 9  | actually was founded in 1998 through a mandate |
| 10 | from the Coast Guard. And it is actually       |
| 11 | Hawaii's Harbor Safety Committee.              |
| 12 | The first thing that I wanted to               |
| 13 | do before I get started was to thank you for   |
| 14 | allowing us to come here.                      |
| 15 | The second thing was to welcome                |
| 16 | the new Panelists, and congratulations to      |
| 17 | them.  |
| 18 | And third, is to apologize for my              |
| 19 | voice which probably will go out about a third |
| 20 | of the way through my presentation because I   |
| 21 | have a bad cold.                               |
| 22 | Next one, please.                              |

| i  |  |
|----|--|
|    | Page 299                                       |
| 1  | I won't read all those things to               |
| 2  | you. You read them. This is a little bit       |
| 3  | about HOST. I think one of the important       |
| 4  | things that I wanted to state is that we're    |
| 5  | kind of like a forum. Our Board is made up of  |
| 6  | representatives from the maritime industry and |
| 7  | maritime users. In fact, Brad is the Vice      |
| 8  | Chair of HOST, and we have people from the     |
| 9  | Harbor Pilots that are on the Board. And we    |
| 10 | don't have Matson right now, but they come to  |
| 11 | our meetings and provide information to HOST.  |
| 12 | And our objective is to try to                 |
| 13 | make Hawaii, to make our marine environment    |
| 14 | safer in terms of accidents and also           |
| 15 | environmentally safe. And so you can look at   |
| 16 | some of the things that we do. There's quite   |
| 17 | a bit more, but these are some of the          |
| 18 | important things.                              |
| 19 | One of the things that we just                 |
| 20 | concluded was last Thursday. As a result of    |
| 21 | the tsunami we had a meeting of about 50       |
| 22 | something, 55 people from all areas of the     |

| Page 3001maritime industry to discuss the things that2went well, the things that didn't go well.3And, hopefully, we've come up with some ways4of improving how we handle tsunamis here in5Hawaii in the maritime community.6Next slide, please.7Our relationship with NOAA has8been very interesting. Up until 2008 we had9no clue we had a clue, but we didn't have10any relationship at all with your group here.11And the reason for that is that our12representative, or the person that represented13you folks to Hawaii lived on the mainland.14And so, obviously, would love to have come15over Jerry would have loved to come over16and gone to our meetings once a month, but I17don't think you could afford to send him.18In 2008 Lieutenant Jeffrey Taylor19moved here, or he was assigned here and20everything changed, and it changed in a very,21yeitive way. And it's changing in a22positive way with Lieutenant Kyle Ryan, who                                   | 1  |  |
|--|----|--|
| <pre>went well, the things that didn't go well.<br/>And, hopefully, we've come up with some ways<br/>of improving how we handle tsunamis here in<br/>Hawaii in the maritime community.<br/>Next slide, please.<br/>Next slide, please.<br/>Our relationship with NOAA has<br/>been very interesting. Up until 2008 we had<br/>no clue we had a clue, but we didn't have<br/>any relationship at all with your group here.<br/>And the reason for that is that our<br/>representative, or the person that represented<br/>you folks to Hawaii lived on the mainland.<br/>And so, obviously, would love to have come<br/>over Jerry would have loved to come over<br/>and gone to our meetings once a month, but I<br/>don't think you could afford to send him.<br/>In 2008 Lieutenant Jeffrey Taylor<br/>moved here, or he was assigned here and<br/>everything changed, and it changed in a very,<br/>very positive way. And it's changing in a</pre>                             |    | Page 300                                       |
| <ul> <li>And, hopefully, we've come up with some ways</li> <li>of improving how we handle tsunamis here in</li> <li>Hawaii in the maritime community.</li> <li>Next slide, please.</li> <li>Our relationship with NOAA has</li> <li>been very interesting. Up until 2008 we had</li> <li>no clue we had a clue, but we didn't have</li> <li>any relationship at all with your group here.</li> <li>And the reason for that is that our</li> <li>representative, or the person that represented</li> <li>you folks to Hawaii lived on the mainland.</li> <li>And so, obviously, would love to have come</li> <li>over Jerry would have loved to come over</li> <li>and gone to our meetings once a month, but I</li> <li>don't think you could afford to send him.</li> <li>In 2008 Lieutenant Jeffrey Taylor</li> <li>moved here, or he was assigned here and</li> <li>everything changed, and it changed in a very,</li> <li>very positive way. And it's changing in a</li> </ul> | 1  | maritime industry to discuss the things that   |
| <ul> <li>of improving how we handle tsunamis here in</li> <li>Hawaii in the maritime community.</li> <li>Next slide, please.</li> <li>Our relationship with NOAA has</li> <li>been very interesting. Up until 2008 we had</li> <li>no clue we had a clue, but we didn't have</li> <li>any relationship at all with your group here.</li> <li>And the reason for that is that our</li> <li>representative, or the person that represented</li> <li>you folks to Hawaii lived on the mainland.</li> <li>And so, obviously, would love to have come</li> <li>over Jerry would have loved to come over</li> <li>and gone to our meetings once a month, but I</li> <li>don't think you could afford to send him.</li> <li>In 2008 Lieutenant Jeffrey Taylor</li> <li>moved here, or he was assigned here and</li> <li>everything changed, and it changed in a very,</li> <li>very positive way. And it's changing in a</li> </ul>   | 2  | went well, the things that didn't go well.     |
| <ul> <li>Hawaii in the maritime community.</li> <li>Next slide, please.</li> <li>Our relationship with NOAA has</li> <li>been very interesting. Up until 2008 we had</li> <li>no clue we had a clue, but we didn't have</li> <li>any relationship at all with your group here.</li> <li>And the reason for that is that our</li> <li>representative, or the person that represented</li> <li>you folks to Hawaii lived on the mainland.</li> <li>And so, obviously, would love to have come</li> <li>over Jerry would have loved to come over</li> <li>and gone to our meetings once a month, but I</li> <li>don't think you could afford to send him.</li> <li>In 2008 Lieutenant Jeffrey Taylor</li> <li>moved here, or he was assigned here and</li> <li>everything changed, and it changed in a very,</li> <li>very positive way. And it's changing in a</li> </ul>  | 3  | And, hopefully, we've come up with some ways   |
| 6 Next slide, please.<br>7 Our relationship with NOAA has<br>8 been very interesting. Up until 2008 we had<br>9 no clue we had a clue, but we didn't have<br>10 any relationship at all with your group here.<br>11 And the reason for that is that our<br>12 representative, or the person that represented<br>13 you folks to Hawaii lived on the mainland.<br>14 And so, obviously, would love to have come<br>15 over Jerry would have loved to come over<br>16 and gone to our meetings once a month, but I<br>17 don't think you could afford to send him.<br>18 In 2008 Lieutenant Jeffrey Taylor<br>19 moved here, or he was assigned here and<br>20 everything changed, and it changed in a very,<br>21 very positive way. And it's changing in a   | 4  | of improving how we handle tsunamis here in    |
| 7Our relationship with NOAA has8been very interesting. Up until 2008 we had9no clue we had a clue, but we didn't have10any relationship at all with your group here.11And the reason for that is that our12representative, or the person that represented13you folks to Hawaii lived on the mainland.14And so, obviously, would love to have come15over Jerry would have loved to come over16and gone to our meetings once a month, but I17don't think you could afford to send him.18In 2008 Lieutenant Jeffrey Taylor19moved here, or he was assigned here and20everything changed, and it changed in a very,21very positive way. And it's changing in a   | 5  | Hawaii in the maritime community.              |
| <ul> <li>been very interesting. Up until 2008 we had</li> <li>no clue we had a clue, but we didn't have</li> <li>any relationship at all with your group here.</li> <li>And the reason for that is that our</li> <li>representative, or the person that represented</li> <li>you folks to Hawaii lived on the mainland.</li> <li>And so, obviously, would love to have come</li> <li>over Jerry would have loved to come over</li> <li>and gone to our meetings once a month, but I</li> <li>don't think you could afford to send him.</li> <li>In 2008 Lieutenant Jeffrey Taylor</li> <li>moved here, or he was assigned here and</li> <li>everything changed, and it changed in a very,</li> <li>very positive way. And it's changing in a</li> </ul>  | 6  | Next slide, please.                            |
| 9no clue we had a clue, but we didn't have10any relationship at all with your group here.11And the reason for that is that our12representative, or the person that represented13you folks to Hawaii lived on the mainland.14And so, obviously, would love to have come15over Jerry would have loved to come over16and gone to our meetings once a month, but I17don't think you could afford to send him.18In 2008 Lieutenant Jeffrey Taylor19moved here, or he was assigned here and20everything changed, and it changed in a very,21very positive way. And it's changing in a  | 7  | Our relationship with NOAA has                 |
| 10any relationship at all with your group here.11And the reason for that is that our12representative, or the person that represented13you folks to Hawaii lived on the mainland.14And so, obviously, would love to have come15over Jerry would have loved to come over16and gone to our meetings once a month, but I17don't think you could afford to send him.18In 2008 Lieutenant Jeffrey Taylor19moved here, or he was assigned here and20everything changed, and it changed in a very,21very positive way. And it's changing in a  | 8  | been very interesting. Up until 2008 we had    |
| 11And the reason for that is that our12representative, or the person that represented13you folks to Hawaii lived on the mainland.14And so, obviously, would love to have come15over Jerry would have loved to come over16and gone to our meetings once a month, but I17don't think you could afford to send him.18In 2008 Lieutenant Jeffrey Taylor19moved here, or he was assigned here and20everything changed, and it changed in a very,21very positive way. And it's changing in a   | 9  | no clue we had a clue, but we didn't have      |
| 12 representative, or the person that represented<br>13 you folks to Hawaii lived on the mainland.<br>14 And so, obviously, would love to have come<br>15 over Jerry would have loved to come over<br>16 and gone to our meetings once a month, but I<br>17 don't think you could afford to send him.<br>18 In 2008 Lieutenant Jeffrey Taylor<br>19 moved here, or he was assigned here and<br>20 everything changed, and it changed in a very,<br>21 very positive way. And it's changing in a  | 10 | any relationship at all with your group here.  |
| 13 you folks to Hawaii lived on the mainland. 14 And so, obviously, would love to have come 15 over Jerry would have loved to come over 16 and gone to our meetings once a month, but I 17 don't think you could afford to send him. 18 In 2008 Lieutenant Jeffrey Taylor 19 moved here, or he was assigned here and 20 everything changed, and it changed in a very, 21 very positive way. And it's changing in a   | 11 | And the reason for that is that our            |
| 14And so, obviously, would love to have come15over Jerry would have loved to come over16and gone to our meetings once a month, but I17don't think you could afford to send him.18In 2008 Lieutenant Jeffrey Taylor19moved here, or he was assigned here and20everything changed, and it changed in a very,21very positive way. And it's changing in a  | 12 | representative, or the person that represented |
| <pre>15 over Jerry would have loved to come over<br/>16 and gone to our meetings once a month, but I<br/>17 don't think you could afford to send him.<br/>18 In 2008 Lieutenant Jeffrey Taylor<br/>19 moved here, or he was assigned here and<br/>20 everything changed, and it changed in a very,<br/>21 very positive way. And it's changing in a</pre>  | 13 | you folks to Hawaii lived on the mainland.     |
| 16 and gone to our meetings once a month, but I 17 don't think you could afford to send him. 18 In 2008 Lieutenant Jeffrey Taylor 19 moved here, or he was assigned here and 20 everything changed, and it changed in a very, 21 very positive way. And it's changing in a   | 14 | And so, obviously, would love to have come     |
| 17 don't think you could afford to send him. 18 In 2008 Lieutenant Jeffrey Taylor 19 moved here, or he was assigned here and 20 everything changed, and it changed in a very, 21 very positive way. And it's changing in a   | 15 | over Jerry would have loved to come over       |
| In 2008 Lieutenant Jeffrey Taylor<br>moved here, or he was assigned here and<br>everything changed, and it changed in a very,<br>very positive way. And it's changing in a   | 16 | and gone to our meetings once a month, but I   |
| 19 moved here, or he was assigned here and<br>20 everything changed, and it changed in a very,<br>21 very positive way. And it's changing in a   | 17 | don't think you could afford to send him.      |
| 20 everything changed, and it changed in a very, 21 very positive way. And it's changing in a  | 18 | In 2008 Lieutenant Jeffrey Taylor              |
| 21 very positive way. And it's changing in a   | 19 | moved here, or he was assigned here and        |
|  | 20 | everything changed, and it changed in a very,  |
| 22 positive way with Lieutenant Kyle Ryan, who   | 21 | very positive way. And it's changing in a      |
|  | 22 | positive way with Lieutenant Kyle Ryan, who    |

Page 301 1 now attends our meetings. 2 And the things that they have done is come to our meetings and said "Here's what 3 4 we do, here's what our programs are. How can 5 we help you?" And I think that this has been very, very important to Hawaii. 6 7 We do work with other NOAA 8 agencies. We work very closely with the Weather Service. The Weather Service in 9 10 Hawaii has had a bad rap up until a number of years ago where you know, the outlook for 11 12 tomorrow little change; and that doesn't work when you're on a ship, a small boat, a vessel 13 offshore. We had an incident, it was a 14 hurricane hit Hilo and it only hit the Big 15 Island and it didn't hit us. And it's hitting 16 17 again right as we speak. No. 18 What happened was I was actually 19 on a fishing boat off of Molokai about 20 20 miles out. And all of a sudden the weather 21 there just was came -- we were right in the 22 midst of a huge wind, but the weather forecast

|    | Page 302                                       |
|----|--|
| 1  | was still talking about Hilo. And so when we   |
| 2  | got back our captain, who was very politically |
| 3  | connected, if you will, he was livid. And so   |
| 4  | what HOST did was take this to the Weather     |
| 5  | Service and say "Look, you know you caused a   |
| 6  | lot of problems because here on Molokai you're |
| 7  | talking about something going on in Hilo which |
| 8  | really doesn't have that much of an effect."   |
| 9  | And they said "Okay. Tell us what you want."   |
| 10 | And by God they did it. And now each island    |
| 11 | has their own service that they can the        |
| 12 | information out and so we don't have to put up |
| 13 | with Hilo when we're off Molokai or Oahu.      |
| 14 | So, we do work very closely with               |
| 15 | them, and of course, the Fish and Wildlife and |
| 16 | we do a lot with the Whale Sanctuary as well.  |
| 17 | The programs that we've worked                 |
| 18 | with you folks on, obviously the current study |
| 19 | which was brought up prior to our discussion   |
| 20 | here. They've been completed. And thank you    |
| 21 | very much for doing that.                      |
| 22 | We also have been trying to look               |

|    | Page 303                                       |
|----|--|
| 1  | at the PORTS system. At this point the         |
| 2  | costing and funding appears to be a problem    |
| 3  | and which areas to include. But PORTS is       |
| 4  | something that I think Hawaii could use, and   |
| 5  | hopefully we can find a way to make this       |
| 6  | happen. Coast Pilot, of course, is being used  |
| 7  | and that's something that is being very        |
| 8  | helpful to our group as well.                  |
| 9  | Next one, please.                              |
| 10 | This is something that this brings             |
| 11 | us to today. And when I say "today," it brings |
| 12 | us to today today. We need some help from      |
| 13 | NOAA because what happened in Japan is going   |
| 14 | to affect Hawaii someday. Now we don't know    |
| 15 | when, but all of the stuff that washed into    |
| 16 | the ocean in Japan is going to find its way to |
| 17 | Hawaii. And I know that because I have a very  |
| 18 | close relation that did a study of currents    |
| 19 | here around Oahu and a number of things that   |
| 20 | he put in the ocean, notes in a bottle,        |
| 21 | actually ended up in the Philippines and in    |
| 22 | Japan. And so I know for a fact, and the       |

|    | Page 304                                       |
|----|--|
| 1  | things that I've found in my lifetime, because |
| 2  | I've lived here my whole life and I've walked  |
| 3  | on the beach many, many years. And the things  |
| 4  | that we find here have come from Japan. So we  |
| 5  | know it's coming.                              |
| 6  | And what's going to happen here is             |
| 7  | if we get inundated by a bunch of stuff from   |
| 8  | Japan, it's going to have a major impact on    |
| 9  | Hawaii. Because the things that come ashore    |
| 10 | can be very devastating to our tourists and    |
| 11 | even to the maritime industry with big timbers |
| 12 | and parts of houses, or whatever is floating   |
| 13 | out there, it's going to be contacting us in   |
| 14 | many ways.                                     |
| 15 | And what I would like to suggest,              |
| 16 | is there a way that NOAA can help us, assist   |
| 17 | us in trying to prepare for this activity      |
| 18 | that's going to hit here? Now, I know it's     |
| 19 | going to be difficult, and I know there's ways |
| 20 | of doing it; satellite imagery or even         |
| 21 | figuring out ways that I don't have a clue,    |
| 22 | to be honest with you. But we need some help.  |

Page 305

|    | Page   |
|----|--|
| 1  | And when I say that this is                    |
| 2  | something that's happening today, there was a  |
| 3  | meeting of some NOAA people, and I don't know  |
| 4  | where the meeting was, but a comment was made  |
| 5  | at that meeting by a NOAA person, and I don't  |
| 6  | know who it was, that they're not going to get |
| 7  | involved until it hits the beach. And that's   |
| 8  | too late. We can't let it hit the beach. If    |
| 9  | we can figure out a way to either find out     |
| 10 | ahead of time so we can prepare or maybe even  |
| 11 | go out and collect some of this stuff at sea.  |
| 12 | But I don't think that waiting until it hits   |
| 13 | the beach is what you folks want to have as    |
| 14 | part of your goals and objectives with         |
| 15 | something that's as important as that.         |
| 16 | So, basically that's a cry that we             |
| 17 | have is that this is coming and we need help.  |
| 18 | And that we hope that we can get it from you.  |
| 19 | That's pretty much my talk. And                |
| 20 | I'll be happy to answer any questions after.   |
| 21 | Thank you very much.                           |
| 22 | CHAIR WELCH: Okay. Good. Thank                 |
| I  |  |

|    | Page 306                                       |
|----|--|
| 1  | you, Mr. Robin.                                |
| 2  | Okay. Mr. Brad Rimmel. Brad, go                |
| 3  | right ahead.                                   |
| 4  | MR. RIMMEL: Thank you.                         |
| 5  | Just a little background on                    |
| 6  | myself. I started sailing as a tug boater here |
| 7  | in the Island on January 1, 1975. I've been    |
| 8  | around the state quite a bit.                  |
| 9  | I asked for your slide. I was                  |
| 10 | going to work off this a little bit. Thank     |
| 11 | you very much. I'm glad you had this.          |
| 12 | And all these readings that you                |
| 13 | folks made have been very helpful.             |
| 14 | With the towing business, and as               |
| 15 | Captain Bob said, you know I've been involved  |
| 16 | with towing Matson barges, you know when I was |
| 17 | with Hawaii Tug and Barge and Sause Bros. But  |
| 18 | I'm just going to ride on the coattails of two |
| 19 | comments already made about currents. And the  |
| 20 | currents do affect us in our transit inter-    |
| 21 | island tremendously, and especially on the     |
| 22 | Hamakua Coast right here.                      |

|    | Page 307                                       |
|----|--|
| 1  | And I'd like to keep in mind at                |
| 2  | Haleakala at 10,000 feet and Mauna Kea at      |
| 3  | 12,000 feet creates a tremendous funnel effect |
| 4  | with the trade winds that normally blow. And   |
| 5  | that those surface winds are below 10,000      |
| 6  | feet. And what happens right in here is just   |
| 7  | enhanced when you hear the weatherman on the   |
| 8  | TV say we have balmy trade winds at 16 or 18   |
| 9  | miles hour. Then our tugs poke their nose      |
| 10 | outside of Molokini and all of a sudden we're  |
| 11 | looking at nice blue skies, but we're looking  |
| 12 | at a wall of water coming at us, but you'd     |
| 13 | thank to God was on the other end of it with   |
| 14 | a white sheet going like this, you know. I     |
| 15 | mean, it just enhances the seas and that type  |
| 16 | of thing.                                      |
| 17 | It decreases the period between                |
| 18 | swells. It's steeper and the wind increases    |
| 19 | dramatically. But if we had information with   |
| 20 | respect to currents, because we've seen our    |
| 21 | tugs slow down dramatically, especially in     |
| 22 | that area off the Halakua coastline on the Big |

|    | Page 308                                       |
|----|--|
| 1  | Island. We lose anywhere from half a knot to   |
| 2  | up to a knot. It may not seem like a lot, but  |
| 3  | our timed arrivals and our schedules are such  |
| 4  | that it really affects the cost of the voyage, |
| 5  | not only for us but for our customers.         |
| 6  | If there was some way you folks                |
| 7  | could look at that; somehow, someway. I know   |
| 8  | that I heard some comments about there's no    |
| 9  | future plans about that type of exploration    |
| 10 | and desire to do that type of thing at this    |
| 11 | time. And I heard earlier before lunch, and    |
| 12 | I sympathize with you folks a great deal in    |
| 13 | respect to your budget and seeing the numbers  |
| 14 | that you've put up there on the screen. And    |
| 15 | I understand this may take an awful long time  |
| 16 | for it to happen. But these currents around    |
| 17 | the islands are very unpredictable. We don't   |
| 18 | know which way they're going to come, when     |
| 19 | they're going to come.                         |
| 20 | I know that Captain Baker deals                |
| 21 | with currents off of Barbers Point Harbor that |
| 22 | are cross currents right into the channel that |

|    | Page 3   | 09 |
|----|--|----|
| 1  | they don't know what they're going to do until |    |
| 2  | they go out there with the pilot boat. And     |    |
| 3  | that can change even by the time they get on   |    |
| 4  | the bridge of the ship and start coming in.    |    |
| 5  | So, it was nice to see this work               |    |
| 6  | being done. And, again, I appreciate it a      |    |
| 7  | whole bunch. But those currents, close-wise    |    |
| 8  | currents and channel currents are really,      |    |
| 9  | really important to us. I could go on and on   |    |
| 10 | about it, but I don't want to beat up a dead   |    |
| 11 | horse where you folks already heard it once    |    |
| 12 | already with me, I mean other than myself.     |    |
| 13 | Some things that have occurred                 |    |
| 14 | since Jeff Taylor came onboard over here has   |    |
| 15 | been really helpful. Captain John, he just     |    |
| 16 | did a great job with us. And Kyle's picked up  |    |
| 17 | the baton and has run with it. And we          |    |
| 18 | appreciate the effort and everything you're    |    |
| 19 | doing a whole bunch.                           |    |
| 20 | I can't say enough about NOAA.                 |    |
| 21 | And thank you guys all very much for the work  |    |
| 22 | that you do.                                   |    |

| Page 3101A comment about the things that2you do do and the products that you provide,3and the services you provide. I don't know if4you're aware, but I think the average mariner5out there really is not aware of all the6things you provide in respect to products and7services. If there was some means and ways8and I've tried my best to educate myself of9all the things that you folks have, and10especially since I have a similar story as11Captain Bob here. I have a lot of sea time12and I got asked to come ashore as a port13captain with Hawaii Tug and Barge for a short14time and I'm with Sause Bros. And my wife15really liked it a lot more than I did, I16assure you. But it's been a great opportunity17and I ve learned a lot about NOAA since I've18been on shore, more so then I was even when I19was out to sea.20But if there was some education21program or process you folks might want to22consider to promote your services and your |    |   |
|---|----|---|
| you do do and the products that you provide,<br>and the services you provide. I don't know if<br>you're aware, but I think the average mariner<br>out there really is not aware of all the<br>things you provide in respect to products and<br>services. If there was some means and ways<br>and I've tried my best to educate myself of<br>all the things that you folks have, and<br>especially since I have a similar story as<br>Captain Bob here. I have a lot of sea time<br>and I got asked to come ashore as a port<br>captain with Hawaii Tug and Barge for a short<br>time and I'm with Sause Bros. And my wife<br>really liked it a lot more than I did, I<br>assure you. But it's been a great opportunity<br>and I've learned a lot about NOAA since I've<br>been on shore, more so then I was even when I<br>was out to sea.<br>En I there was some education<br>program or process you folks might want to   |    | Page 310                                      |
| and the services you provide. I don't know ifyou're aware, but I think the average marinerout there really is not aware of all thethings you provide in respect to products andservices. If there was some means and waysand I've tried my best to educate myself ofall the things that you folks have, andespecially since I have a similar story asCaptain Bob here. I have a lot of sea timeand I got asked to come ashore as a portcaptain with Hawaii Tug and Barge for a shorttime and I'm with Sause Bros. And my wifereally liked it a lot more than I did, Iassure you. But it's been a great opportunityand I 've learned a lot about NOAA since I'vebeen on shore, more so then I was even when Iwas out to sea.DBut if there was some educationprogram or process you folks might want to   | 1  | A comment about the things that               |
| <ul> <li>you're aware, but I think the average mariner</li> <li>out there really is not aware of all the</li> <li>things you provide in respect to products and</li> <li>services. If there was some means and ways</li> <li>and I've tried my best to educate myself of</li> <li>all the things that you folks have, and</li> <li>especially since I have a similar story as</li> <li>Captain Bob here. I have a lot of sea time</li> <li>and I got asked to come ashore as a port</li> <li>captain with Hawaii Tug and Barge for a short</li> <li>time and I'm with Sause Bros. And my wife</li> <li>really liked it a lot more than I did, I</li> <li>assure you. But it's been a great opportunity</li> <li>and I've learned a lot about NOAA since I've</li> <li>been on shore, more so then I was even when I</li> <li>was out to sea.</li> </ul>   | 2  | you do do and the products that you provide,  |
| 5out there really is not aware of all the6things you provide in respect to products and7services. If there was some means and ways8and I've tried my best to educate myself of9all the things that you folks have, and10especially since I have a similar story as11Captain Bob here. I have a lot of sea time12and I got asked to come ashore as a port13captain with Hawaii Tug and Barge for a short14time and I'm with Sause Bros. And my wife15really liked it a lot more than I did, I16assure you. But it's been a great opportunity17and I've learned a lot about NOAA since I've18been on shore, more so then I was even when I19was out to sea.20But if there was some education21program or process you folks might want to  | 3  | and the services you provide. I don't know if |
| <ul> <li>things you provide in respect to products and</li> <li>services. If there was some means and ways</li> <li>and I've tried my best to educate myself of</li> <li>all the things that you folks have, and</li> <li>especially since I have a similar story as</li> <li>Captain Bob here. I have a lot of sea time</li> <li>and I got asked to come ashore as a port</li> <li>captain with Hawaii Tug and Barge for a short</li> <li>time and I'm with Sause Bros. And my wife</li> <li>really liked it a lot more than I did, I</li> <li>assure you. But it's been a great opportunity</li> <li>and I've learned a lot about NOAA since I've</li> <li>been on shore, more so then I was even when I</li> <li>was out to sea.</li> <li>But if there was some education</li> <li>program or process you folks might want to</li> </ul>   | 4  | you're aware, but I think the average mariner |
| revices. If there was some means and ways and I've tried my best to educate myself of all the things that you folks have, and especially since I have a similar story as Captain Bob here. I have a lot of sea time and I got asked to come ashore as a port captain with Hawaii Tug and Barge for a short time and I'm with Sause Bros. And my wife really liked it a lot more than I did, I assure you. But it's been a great opportunity and I've learned a lot about NOAA since I've been on shore, more so then I was even when I was out to sea. But if there was some education program or process you folks might want to   | 5  | out there really is not aware of all the      |
| <ul> <li>and I've tried my best to educate myself of</li> <li>all the things that you folks have, and</li> <li>especially since I have a similar story as</li> <li>Captain Bob here. I have a lot of sea time</li> <li>and I got asked to come ashore as a port</li> <li>captain with Hawaii Tug and Barge for a short</li> <li>time and I'm with Sause Bros. And my wife</li> <li>really liked it a lot more than I did, I</li> <li>assure you. But it's been a great opportunity</li> <li>and I've learned a lot about NOAA since I've</li> <li>been on shore, more so then I was even when I</li> <li>was out to sea.</li> <li>But if there was some education</li> <li>program or process you folks might want to</li> </ul>  | б  | things you provide in respect to products and |
| <ul> <li>all the things that you folks have, and</li> <li>especially since I have a similar story as</li> <li>Captain Bob here. I have a lot of sea time</li> <li>and I got asked to come ashore as a port</li> <li>captain with Hawaii Tug and Barge for a short</li> <li>time and I'm with Sause Bros. And my wife</li> <li>really liked it a lot more than I did, I</li> <li>assure you. But it's been a great opportunity</li> <li>and I've learned a lot about NOAA since I've</li> <li>been on shore, more so then I was even when I</li> <li>was out to sea.</li> <li>But if there was some education</li> <li>program or process you folks might want to</li> </ul>   | 7  | services. If there was some means and ways    |
| 10 especially since I have a similar story as<br>11 Captain Bob here. I have a lot of sea time<br>12 and I got asked to come ashore as a port<br>13 captain with Hawaii Tug and Barge for a short<br>14 time and I'm with Sause Bros. And my wife<br>15 really liked it a lot more than I did, I<br>16 assure you. But it's been a great opportunity<br>17 and I've learned a lot about NOAA since I've<br>18 been on shore, more so then I was even when I<br>19 was out to sea.<br>20 But if there was some education<br>21 program or process you folks might want to  | 8  | and I've tried my best to educate myself of   |
| 11 Captain Bob here. I have a lot of sea time<br>12 and I got asked to come ashore as a port<br>13 captain with Hawaii Tug and Barge for a short<br>14 time and I'm with Sause Bros. And my wife<br>15 really liked it a lot more than I did, I<br>16 assure you. But it's been a great opportunity<br>17 and I've learned a lot about NOAA since I've<br>18 been on shore, more so then I was even when I<br>19 was out to sea.<br>20 But if there was some education<br>21 program or process you folks might want to   | 9  | all the things that you folks have, and       |
| 12and I got asked to come ashore as a port13captain with Hawaii Tug and Barge for a short14time and I'm with Sause Bros. And my wife15really liked it a lot more than I did, I16assure you. But it's been a great opportunity17and I've learned a lot about NOAA since I've18been on shore, more so then I was even when I19was out to sea.20But if there was some education21program or process you folks might want to  | 10 | especially since I have a similar story as    |
| <ul> <li>13 captain with Hawaii Tug and Barge for a short</li> <li>14 time and I'm with Sause Bros. And my wife</li> <li>15 really liked it a lot more than I did, I</li> <li>16 assure you. But it's been a great opportunity</li> <li>17 and I've learned a lot about NOAA since I've</li> <li>18 been on shore, more so then I was even when I</li> <li>19 was out to sea.</li> <li>20 But if there was some education</li> <li>21 program or process you folks might want to</li> </ul>   | 11 | Captain Bob here. I have a lot of sea time    |
| 14 time and I'm with Sause Bros. And my wife<br>15 really liked it a lot more than I did, I<br>16 assure you. But it's been a great opportunity<br>17 and I've learned a lot about NOAA since I've<br>18 been on shore, more so then I was even when I<br>19 was out to sea.<br>20 But if there was some education<br>21 program or process you folks might want to   | 12 | and I got asked to come ashore as a port      |
| 15 really liked it a lot more than I did, I 16 assure you. But it's been a great opportunity 17 and I've learned a lot about NOAA since I've 18 been on shore, more so then I was even when I 19 was out to sea. 20 But if there was some education 21 program or process you folks might want to   | 13 | captain with Hawaii Tug and Barge for a short |
| 16 assure you. But it's been a great opportunity<br>17 and I've learned a lot about NOAA since I've<br>18 been on shore, more so then I was even when I<br>19 was out to sea.<br>20 But if there was some education<br>21 program or process you folks might want to  | 14 | time and I'm with Sause Bros. And my wife     |
| 17 and I've learned a lot about NOAA since I've<br>18 been on shore, more so then I was even when I<br>19 was out to sea.<br>20 But if there was some education<br>21 program or process you folks might want to  | 15 | really liked it a lot more than I did, I      |
| 18 been on shore, more so then I was even when I<br>19 was out to sea.<br>20 But if there was some education<br>21 program or process you folks might want to   | 16 | assure you. But it's been a great opportunity |
| <pre>19 was out to sea. 20 But if there was some education 21 program or process you folks might want to</pre>  | 17 | and I've learned a lot about NOAA since I've  |
| 20 But if there was some education<br>21 program or process you folks might want to   | 18 | been on shore, more so then I was even when I |
| 21 program or process you folks might want to   | 19 | was out to sea.                               |
|   | 20 | But if there was some education               |
| 22 consider to promote your services and your   | 21 | program or process you folks might want to    |
|   | 22 | consider to promote your services and your    |

|    | Page 311                                       |
|----|--|
| 1  | product, I think it could be helpful. But      |
| 2  | that could be a double edged sword because all |
| 3  | of a sudden you'll find that maybe a lot of    |
| 4  | people get educated about what you can do and  |
| 5  | provide and it's free, and all of a sudden     |
| 6  | you're going to get a lot of requests and your |
| 7  | budget's already been cut. So I don't know     |
| 8  | how that would work out, really.               |
| 9  | It's a tremendous job you folks                |
| 10 | do, but I think that there's a lot of things   |
| 11 | that aren't being utilized of all the things   |
| 12 | that you do do in respect to the people you're |
| 13 | trying to provide it for. I think you'd be     |
| 14 | surprised at how little some folks that really |
| 15 | need your product know about it.               |
| 16 | Anyway, in respect to some of the              |
| 17 | things that you've achieved over here in       |
| 18 | weather reports. We go into Kaumalapau on the  |
| 19 | Island of Lanai, right there. I notice you     |
| 20 | have a buoy out there, or did. We rely on      |
| 21 | that tremendously.                             |
| 22 | We get the weather report the day              |

Page 312 before we load, or the day of that we load. 1 2 And we make our full decision whether we're 3 going to have any success with this voyage or 4 not that morning. Okay. It's a go. We load, 5 leave that night on Kaumalapau the next following morning. And whether the surge 6 7 and/or the tide and the current and the wind 8 is going to be what it is predicted is going 9 to be the success story or not of that voyage. And that island does not have a lot of 10 11 storage. As Captain Steve said, our 12 warehousing is in our transit. We don't have a lot of warehousing. And they're not going 13 14 to increase the storage area out there in tanks because of just the new regulations and 15 the cost in and of itself. 16 17 And if they run out of fuel and we're on a two week schedule. And if we miss 18 19 one weekend, the next one's two weeks later. 20 So the last load was four weeks ago, we're 21 looking at the lights going out, possibly. So 22 that's how important that information is for

| Page 313<br>us for just going to Lanai. So, again, thank<br>you. Appreciate it.<br>I'm going to go ahead and pass it<br>on to the Coast Guard. I know that I've<br>ridden on the coattails of a lot of stuff<br>that's already been said here.<br>And again, thank you very much for<br>allowing us to be here and talk to you, and<br>for the job that you do. Appreciate it very<br>much.<br>CHAIR WELCH: Okay. Great.<br>Thanks for the comments.<br>And then let's go ahead and turn<br>to the Coast Guard and Lieutenant Doug Miller.<br>Lieutenant, go right ahead.<br>LIEUTENANT MILLER: Aloha,<br>everyone.<br>Just as a quick thing, prior to<br>this meeting we had some people do some clear-<br>cutting around one of our aids navigation.<br>Unfortunately, they didn't pay attention to<br>the endangered species plant that happened to   |    |  |
|--|----|--|
| you. Appreciate it. I'm going to go ahead and pass it on to the Coast Guard. I know that I've ridden on the coattails of a lot of stuff that's already been said here. And again, thank you very much for allowing us to be here and talk to you, and for the job that you do. Appreciate it very much. CHAIR WELCH: Okay. Great. Thanks for the comments. And then let's go ahead and turn to the Coast Guard and Lieutenant Doug Miller. Lieutenant, go right ahead. LiEUTENANT MILLER: Aloha, everyone. Just as a quick thing, prior to this meeting we had some people do some clear- cutting around one of our aids navigation. Unfortunately, they didn't pay attention to   |    | Page 313                                       |
| 3       I'm going to go ahead and pass it         4       on to the Coast Guard. I know that I've         5       ridden on the coattails of a lot of stuff         6       that's already been said here.         7       And again, thank you very much for         8       allowing us to be here and talk to you, and         9       for the job that you do. Appreciate it very         10       much.         11       CHAIR WELCH: Okay. Great.         12       Thanks for the comments.         13       And then let's go ahead and turn         14       to the Coast Guard and Lieutenant Doug Miller.         15       Lieutenant, go right ahead.         16       LIEUTENANT MILLER: Aloha,         17       everyone.         18       Just as a quick thing, prior to         19       this meeting we had some people do some clear-         20       cutting around one of our aids navigation.         21       Unfortunately, they didn't pay attention to | 1  | us for just going to Lanai. So, again, thank   |
| <ul> <li>4 on to the Coast Guard. I know that I've</li> <li>5 ridden on the coattails of a lot of stuff</li> <li>6 that's already been said here.</li> <li>7 And again, thank you very much for</li> <li>8 allowing us to be here and talk to you, and</li> <li>9 for the job that you do. Appreciate it very</li> <li>10 much.</li> <li>11 CHAIR WELCH: Okay. Great.</li> <li>12 Thanks for the comments.</li> <li>13 And then let's go ahead and turn</li> <li>14 to the Coast Guard and Lieutenant Doug Miller.</li> <li>15 Lieutenant, go right ahead.</li> <li>16 LIEUTENANT MILLER: Aloha,</li> <li>17 everyone.</li> <li>18 Just as a quick thing, prior to</li> <li>19 this meeting we had some people do some clear-</li> <li>20 cutting around one of our aids navigation.</li> <li>21 Unfortunately, they didn't pay attention to</li> </ul>  | 2  | you. Appreciate it.                            |
| 5 ridden on the coattails of a lot of stuff 6 that's already been said here. 7 And again, thank you very much for 8 allowing us to be here and talk to you, and 9 for the job that you do. Appreciate it very 10 much. 11 CHAIR WELCH: Okay. Great. 12 Thanks for the comments. 13 And then let's go ahead and turn 14 to the Coast Guard and Lieutenant Doug Miller. 15 Lieutenant, go right ahead. 16 LIEUTENANT MILLER: Aloha, 17 everyone. 18 Just as a quick thing, prior to 19 this meeting we had some people do some clear- 20 cutting around one of our aids navigation. 21 Unfortunately, they didn't pay attention to   | 3  | I'm going to go ahead and pass it              |
| <ul> <li>that's already been said here.</li> <li>And again, thank you very much for</li> <li>allowing us to be here and talk to you, and</li> <li>for the job that you do. Appreciate it very</li> <li>much.</li> <li>CHAIR WELCH: Okay. Great.</li> <li>Thanks for the comments.</li> <li>And then let's go ahead and turn</li> <li>to the Coast Guard and Lieutenant Doug Miller.</li> <li>Lieutenant, go right ahead.</li> <li>LIEUTENANT MILLER: Aloha,</li> <li>everyone.</li> <li>Just as a quick thing, prior to</li> <li>this meeting we had some people do some clear-</li> <li>cutting around one of our aids navigation.</li> <li>Unfortunately, they didn't pay attention to</li> </ul>  | 4  | on to the Coast Guard. I know that I've        |
| 7       And again, thank you very much for         8       allowing us to be here and talk to you, and         9       for the job that you do. Appreciate it very         10       much.         11       CHAIR WELCH: Okay. Great.         12       Thanks for the comments.         13       And then let's go ahead and turn         14       to the Coast Guard and Lieutenant Doug Miller.         15       Lieutenant, go right ahead.         16       LIEUTENANT MILLER: Aloha,         17       everyone.         18       Just as a quick thing, prior to         19       this meeting we had some people do some clear-         20       cutting around one of our aids navigation.         21       Unfortunately, they didn't pay attention to  | 5  | ridden on the coattails of a lot of stuff      |
| <ul> <li>allowing us to be here and talk to you, and</li> <li>for the job that you do. Appreciate it very</li> <li>much.</li> <li>CHAIR WELCH: Okay. Great.</li> <li>Thanks for the comments.</li> <li>And then let's go ahead and turn</li> <li>to the Coast Guard and Lieutenant Doug Miller.</li> <li>Lieutenant, go right ahead.</li> <li>LIEUTENANT MILLER: Aloha,</li> <li>everyone.</li> <li>Just as a quick thing, prior to</li> <li>this meeting we had some people do some clear-</li> <li>cutting around one of our aids navigation.</li> <li>Unfortunately, they didn't pay attention to</li> </ul>  | б  | that's already been said here.                 |
| <ul> <li>for the job that you do. Appreciate it very</li> <li>much.</li> <li>CHAIR WELCH: Okay. Great.</li> <li>Thanks for the comments.</li> <li>And then let's go ahead and turn</li> <li>to the Coast Guard and Lieutenant Doug Miller.</li> <li>Lieutenant, go right ahead.</li> <li>LIEUTENANT MILLER: Aloha,</li> <li>everyone.</li> <li>Just as a quick thing, prior to</li> <li>this meeting we had some people do some clear-</li> <li>cutting around one of our aids navigation.</li> <li>Unfortunately, they didn't pay attention to</li> </ul>   | 7  | And again, thank you very much for             |
| <ul> <li>10 much.</li> <li>11 CHAIR WELCH: Okay. Great.</li> <li>12 Thanks for the comments.</li> <li>13 And then let's go ahead and turn</li> <li>14 to the Coast Guard and Lieutenant Doug Miller.</li> <li>15 Lieutenant, go right ahead.</li> <li>16 LIEUTENANT MILLER: Aloha,</li> <li>17 everyone.</li> <li>18 Just as a quick thing, prior to</li> <li>19 this meeting we had some people do some clear-</li> <li>20 cutting around one of our aids navigation.</li> <li>21 Unfortunately, they didn't pay attention to</li> </ul>  | 8  | allowing us to be here and talk to you, and    |
| <ul> <li>11 CHAIR WELCH: Okay. Great.</li> <li>12 Thanks for the comments.</li> <li>13 And then let's go ahead and turn</li> <li>14 to the Coast Guard and Lieutenant Doug Miller.</li> <li>15 Lieutenant, go right ahead.</li> <li>16 LIEUTENANT MILLER: Aloha,</li> <li>17 everyone.</li> <li>18 Just as a quick thing, prior to</li> <li>19 this meeting we had some people do some clear-</li> <li>20 cutting around one of our aids navigation.</li> <li>21 Unfortunately, they didn't pay attention to</li> </ul>  | 9  | for the job that you do. Appreciate it very    |
| <ul> <li>12 Thanks for the comments.</li> <li>13 And then let's go ahead and turn</li> <li>14 to the Coast Guard and Lieutenant Doug Miller.</li> <li>15 Lieutenant, go right ahead.</li> <li>16 LIEUTENANT MILLER: Aloha,</li> <li>17 everyone.</li> <li>18 Just as a quick thing, prior to</li> <li>19 this meeting we had some people do some clear-</li> <li>20 cutting around one of our aids navigation.</li> <li>21 Unfortunately, they didn't pay attention to</li> </ul>  | 10 | much.  |
| And then let's go ahead and turn<br>to the Coast Guard and Lieutenant Doug Miller.<br>Lieutenant, go right ahead.<br>LIEUTENANT MILLER: Aloha,<br>everyone. Just as a quick thing, prior to this meeting we had some people do some clear- cutting around one of our aids navigation. Unfortunately, they didn't pay attention to  | 11 | CHAIR WELCH: Okay. Great.                      |
| 14 to the Coast Guard and Lieutenant Doug Miller.<br>15 Lieutenant, go right ahead.<br>16 LIEUTENANT MILLER: Aloha,<br>17 everyone.<br>18 Just as a quick thing, prior to<br>19 this meeting we had some people do some clear-<br>20 cutting around one of our aids navigation.<br>21 Unfortunately, they didn't pay attention to  | 12 | Thanks for the comments.                       |
| 15 Lieutenant, go right ahead.<br>LIEUTENANT MILLER: Aloha,<br>17 everyone.<br>18 Just as a quick thing, prior to<br>19 this meeting we had some people do some clear-<br>20 cutting around one of our aids navigation.<br>21 Unfortunately, they didn't pay attention to  | 13 | And then let's go ahead and turn               |
| 16 LIEUTENANT MILLER: Aloha,<br>17 everyone.<br>18 Just as a quick thing, prior to<br>19 this meeting we had some people do some clear-<br>20 cutting around one of our aids navigation.<br>21 Unfortunately, they didn't pay attention to   | 14 | to the Coast Guard and Lieutenant Doug Miller. |
| <pre>17 everyone.<br/>18 Just as a quick thing, prior to<br/>19 this meeting we had some people do some clear-<br/>20 cutting around one of our aids navigation.<br/>21 Unfortunately, they didn't pay attention to</pre>  | 15 | Lieutenant, go right ahead.                    |
| Just as a quick thing, prior to<br>this meeting we had some people do some clear-<br>cutting around one of our aids navigation.<br>Unfortunately, they didn't pay attention to   | 16 | LIEUTENANT MILLER: Aloha,                      |
| 19 this meeting we had some people do some clear-<br>20 cutting around one of our aids navigation.<br>21 Unfortunately, they didn't pay attention to   | 17 | everyone.                                      |
| 20 cutting around one of our aids navigation. 21 Unfortunately, they didn't pay attention to   | 18 | Just as a quick thing, prior to                |
| 21 Unfortunately, they didn't pay attention to   | 19 | this meeting we had some people do some clear- |
|  | 20 | cutting around one of our aids navigation.     |
| 22 the endangered species plant that happened to   | 21 | Unfortunately, they didn't pay attention to    |
|  | 22 | the endangered species plant that happened to  |

|    | Page 314                                       |
|----|--|
| 1  | be right in the area. So I've got to go deal   |
| 2  | with that after this.                          |
| 3  | First of all, I'd like to say that             |
| 4  | the United States Coast Guard and NOAA have    |
| 5  | had a long partnership. And we really          |
| 6  | appreciate the partnership and good working    |
| 7  | relationship we've had with all of you.        |
| 8  | I've been doing waterways now in               |
| 9  | the Coast Guard for about eight years, which   |
| 10 | compared to my compatriots isn't very long but |
| 11 | for the Coast Guard that's actually an awfully |
| 12 | long time to be doing any particular one job.  |
| 13 | Through Sector Long Island Sound and then out  |
| 14 | here in Hawaii.                                |
| 15 | First, I'd like to focus on what               |
| 16 | are we providing NOAA and what services does   |
| 17 | the Coast Guard provide NOAA. The big thing    |
| 18 | that I would say that we do is in the aids to  |
| 19 | navigation realm. And what I mean by that is   |
| 20 | all the buoys, all the ranges, all the private |
| 21 | aids to navigation, all the bridge data; all   |
| 22 | that information is collected by the Coast     |

|    | Page 315                                      |
|----|---|
| 1  | Guard. And with the exception of the bridge   |
| 2  | data, that's put into our electronic systems  |
| 3  | ATONIS. And then physically NOAA pulls from   |
| 4  | the ATONIS system and that's where you guys   |
| 5  | get your chart updates as far ATONIS and      |
| 6  | everything else goes. And that system works   |
| 7  | very, very well. And I can't say enough about |
| 8  | how well that works.                          |
| 9  | The same thing goes with the White            |
| 10 | List. So I think that's a great success.      |
| 11 | Another think that I would mention            |
| 12 | we do partner with NOAA physically on marine  |
| 13 | debris issues. Whenever our buoy tenders are  |
| 14 | out, we actually try to see if we can         |
| 15 | coordinate and go there in the                |
| 16 | Papahanaumokuakea Marine National Moment and  |
| 17 | pick up I know it's a long word debris        |
| 18 | when we can. So, again, that's a great        |
| 19 | partnership with NOAA.                        |
| 20 | Another thing that the Coast Guard            |
| 21 | provides the local area and I can slow down   |
| 22 | my talking. I'm a New Englander, I talk fast. |

|    | Page 316                                      |
|----|---|
| 1  | I got to remember this is Hawaii. I have      |
| 2  | time.   |
| 3  | CHAIR WELCH: I think I'm                      |
| 4  | following you, but I guess our court reporter |
| 5  | is the key person.                            |
| б  | LIEUTENANT MILLER: So I'll slow               |
| 7  | down.   |
| 8  | Another service that we provide is            |
| 9  | the local Notice to Mariners, which is a      |
| 10 | publication that's put out to mariners that   |
| 11 | lets people know what changes have been made  |
| 12 | in the area and what hazards or anything they |
| 13 | have to watch out for.                        |
| 14 | We also do Broadcast Notice to                |
| 15 | Mariners which is basically just a broadcast  |
| 16 | over the airways of anything that should      |
| 17 | become hazardous.                             |
| 18 | And then we also do, things that              |
| 19 | directly affect NOAA are the HYDROPACs and    |
| 20 | NAVPACs which are basically broadcasts that   |
| 21 | are more than 200 nautical miles offshore.    |
| 22 | And with that, we also have our               |

| 1  |  |
|----|--|
|    | Page 31  |
| 1  | WLB fleet, which is basically our black hulled |
| 2  | buoy tenders. We have three buoy tenders here  |
| 3  | in D-14 and they are the Kukui and the Walnut  |
| 4  | which is stationed here in Honolulu and then   |
| 5  | we have the Sequoia which is stationed down in |
| 6  | Guam.  |
| 7  | Now how that's important for                   |
| 8  | everyone here is we really, really try to      |
| 9  | partner with NOAA for the NOAA sea buoys, for  |
| 10 | the dart buoys, for the tidal gauges; for all  |
| 11 | these other things that are happening out in   |
| 12 | the Pacific. They are vessels of opportunity   |
| 13 | that physically when we're in the area we will |
| 14 | try to assist you with working the gauges,     |
| 15 | working the buoys. And actually, we are        |
| 16 | allocated X many hours per year physically to  |
| 17 | help NOAA with the NOAA buoy system.           |
| 18 | You know, sometimes because of the             |
| 19 | size of the buoys, sometimes we can hook them  |
| 20 | up, sometimes we miss them. It's a hit or      |
| 21 | miss depending on the weather. So that is a    |
| 22 | service that we provide.                       |

7

|    | Page 318                                       |
|----|--|
| 1  | Services that you guys provide us.             |
| 2  | It would be a very, very long list if I tried  |
| 3  | to list everything. So I think instead of      |
| 4  | listing everything, I'm going to capitalize on |
| 5  | what I think we can improve.                   |
| 6  | The first thing I'd like to touch              |
| 7  | on is the electronic charts versus the paper   |
| 8  | charts. Right now there are some subtle        |
| 9  | discrepancies that we see between the ENCs and |
| 10 | the RNCs, and again the Raster charts when you |
| 11 | toss those in, too. And I think that from the  |
| 12 | mariner's standpoint and from the Coast        |
| 13 | Guard's standpoint it's very critical that we  |
| 14 | have a seamless marriage between those data    |
| 15 | streams so as not to create confusion to the   |
| 16 | mariners as to what is actually there.         |
| 17 | A good example of that is the                  |
| 18 | recent confusion we've had with the range      |
| 19 | lines between the RNC and the ENC. So I think  |
| 20 | that that's a way that the Coast Guard can     |
| 21 | provide you possibly better data and that we   |
| 22 | can try to bring those things into parallel    |

with one another. Another issue that I'd like to bring up is specifically chart inserts. Here in the Hawaiian Island, like I'm going to use Lahaina as an example, I've got eight buoys inside of approximately one square centimeter on the highest chart that I can get. There's probably a very easy mechanism in place for us to request inserts to do, I'm not sure of what that is, and I'm not sure the mariners know what that is. So maybe that's something that we can address. Again, if the chart's not used for navigation and the information is not reliable and it's of a scale that you can't really see what's there, then the chart's no good. So I think that's something. And again, if no one's providing you that information that hey

19 we need a better scale chart, then how do you 20 know that it's not working.

21 Another issue that's recently come 22 up specifically here in D-14 that we're trying

> Neal R. Gross & Co., Inc. 202-234-4433

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

1

|    | Page 320                                       |
|----|--|
| 1  | to address is private aids to navigation, or   |
| 2  | what I'll refer to as PATON.                   |
| 3  | What do we do from a charting                  |
| 4  | standpoint when we have disestablished a PATON |
| 5  | because the person is no longer maintaining    |
| 6  | that, but the PATON is still present. The      |
| 7  | person has not removed it. So technically      |
| 8  | it's still there, so is it do we chart it?     |
| 9  | But then who is now responsible for making     |
| 10 | sure that it's still there, it's maintained    |
| 11 | and all that other stuff?                      |
| 12 | So we have this discrepancies                  |
| 13 | because typically with a federal aid to        |
| 14 | navigation as soon as we take it out of the    |
| 15 | water, we let you know, it would be in ATONIS  |
| 16 | that it's no longer there. With private aids   |
| 17 | to navigation when we disestablish something,  |
| 18 | it may be disestablished in ATONIS, which is   |
| 19 | our data system, the physical aid may still be |
| 20 | there. So I think that's a discrepancy that    |
| 21 | NOAA and the United States Coast Guard have to |
| 22 | officially work out with one another.          |

|    | Page 321                                       |
|----|--|
| 1  | And another thing to echo what was             |
| 2  | said here earlier specifically in regard to    |
| 3  | post-storm surveys and recovery, the use of a  |
| 4  | side-scan sonar team where that can greatly    |
| 5  | facilitate the reopening of a port. I know we  |
| 6  | do have some service locally on island, but I  |
| 7  | know that that's going to be really key should |
| 8  | anything significantly happen is to run that   |
| 9  | sonar, run that data through there to get      |
| 10 | commerce moving as quickly as possible.        |
| 11 | So I think that's the big areas                |
| 12 | that I wanted to touch upon.                   |
| 13 | And again, I'd like to thank                   |
| 14 | everyone here for your partnership, and coming |
| 15 | out to Hawaii.                                 |
| 16 | And I guess we're open for                     |
| 17 | questions now.                                 |
| 18 | CHAIR WELCH: Okay. Good.                       |
| 19 | Since Lieutenant Miller is going               |
| 20 | to have to leave in about ten minutes, let me  |
| 21 | encourage if anybody has a question directed   |
| 22 | to him, to ask that. So, Sherri?               |

|    | Page 322                                       |
|----|--|
| 1  | MEMBER HICKMAN: Yes. Actually                  |
| 2  | mine is directed to Captain Steve. It's more   |
| 3  | of a comment, and maybe something for          |
| 4  | everybody to look into in Houston.             |
| 5  | It appears we have the same thing.             |
| 6  | The pilot boat runs in the Mississippi River   |
| 7  | for after Katrina; it was Lake Charles after   |
| 8  | Rita, it was Houston after Ike. We run our     |
| 9  | pilot boats with our little bathyometers and   |
| 10 | we look for any big obstruction.               |
| 11 | And in Houston, and I've mentioned             |
| 12 | it to this Panel before, at least those that   |
| 13 | are still here and not the new ones, but we    |
| 14 | have actually tried to come up with plans from |
| 15 | NOAA for us to have a side-scan sonar on one   |
| 16 | of our boats. And if you guys sit it here,     |
| 17 | all they have to do is bring the team in to    |
| 18 | read the information. They don't have to bring |
| 19 | a boat in. They don't have to bring the side-  |
| 20 | scan sonar. Just come onboard our boat and     |
| 21 | run the equipment.                             |
| 22 | We haven't gotten too much headway             |

|    | Page 323                                       |
|----|--|
| 1  | with that. But we're willing to even to pay    |
| 2  | for that in Houston so that we can open much   |
| 3  | quicker after a storm. So I think that might   |
| 4  | if we get off with it, I think that's          |
| 5  | something that you guys might want to look     |
| 6  | into as well.                                  |
| 7  | CHAIR WELCH: Thanks, Sherri.                   |
| 8  | Anybody else that has a comment or             |
| 9  | a question particularly for Lieutenant Miller? |
| 10 | Yes, go ahead, Lawson.                         |
| 11 | MEMBER BRIGHAM: Yes. I wondered                |
| 12 | if the Coast Guard had put out any             |
| 13 | information, safety bulletin or something,     |
| 14 | about this potential deluge of debris across   |
| 15 | the Pacific Ocean because maybe Matson or      |
| 16 | somebody will find it as they transit the      |
| 17 | ocean.   |
| 18 | I've heard about it because we                 |
| 19 | think in Alaska in will come up enough across  |
| 20 | the Pacific and reach the Aleutian Chain, and  |
| 21 | it might be nuclear debris; who knows? And so  |
| 22 | it's an issue.                                 |

|    | Page 324                                       |
|----|--|
| 1  | Coast Guard sending anything into              |
| 2  | Washington or to the world on this issue?      |
| 3  | LIEUTENANT MILLER: We actually                 |
| 4  | had direction from Washington to run something |
| 5  | in the local Notice to Mariners, specifically  |
| 6  | in regard to potential debris floating from    |
| 7  | Japan. It should be in the local Notice to     |
| 8  | Mariners, but I can check that when I get back |
| 9  | and make sure that it is actually being        |
| 10 | included in it.                                |
| 11 | CHAIR WELCH: Yes. Jeff?                        |
| 12 | MEMBER CAROTHERS: Yes. Jeff                    |
| 13 | Carothers here.                                |
| 14 | Yes, I kind of want to address                 |
| 15 | your question, I think two of you had a        |
| 16 | question on the quick turnaround on survey     |
| 17 | after the event, side-scan, or whatever. Is    |
| 18 | that required in NOAA's bailiwick or is it     |
| 19 | more I know I'm from California. I mean,       |
| 20 | the Corps of Engineers does a lot of that type |
| 21 | of clearance, even private industry does a lot |
| 22 | of that type of cleaning up. So I'm just       |
|    | Page 325                                       |
|----|--|
| 1  | wondering if the Corps of Engineers has any    |
| 2  | equipment and people here to help clear.       |
| 3  | LIEUTENANT MILLER: Corps of                    |
| 4  | Engineers has some equipment here, but they    |
| 5  | don't have anything that's capable, that I'm   |
| б  | aware of, for side-scan sonar or anything like |
| 7  | that.  |
| 8  | MEMBER CAROTHERS: How about the                |
| 9  | Navy.  |
| 10 | LIEUTENANT MILLER: Now the Navy                |
| 11 | may, or private company may. But then the      |
| 12 | problem is you're going to run into with that  |
| 13 | is you're talking about legal liability.       |
| 14 | MEMBER CAROTHERS: Yes.                         |
| 15 | LIEUTENANT MILLER: It's, you know              |
| 16 | I can take data from the Army Corps of         |
| 17 | Engineers from NOAA and that's good for        |
| 18 | liability. If I take information directly from |
| 19 | the pilot boats, now who has liability if      |
| 20 | there's actually something there? So that's    |
| 21 | something I would run by our legal department  |
| 22 | prior to moving forward with that.             |

Page 326 1 I think it's good information to 2 consider prior to opening the port, and Ms. Rehnquist would probably have an interest in 3 that as far as from the Captain of the Port 4 5 reopening the port goes. But I do think that 6 there's probably a legal issue there that 7 would need to be worked out first. 8 MEMBER CAROTHERS: If it's 9 coordinated --10 LIEUTENANT MILLER: Yes, if it's coordinated it's fine. 11 12 CHAIR WELCH: Lieutenant Ryan? 13 COURT REPORTER: Could you use the 14 microphone? 15 LT. RYAN: Oh, yes. Sorry. 16 I sit on a group with Sector 17 Honolulu with the Navy and some industry folks. If Honolulu Harbor were to be shutdown 18 19 due to a catastrophic event such as a 20 hurricane or a tsunami or major earthquake, or 21 something, the Maritime Transportation Salvage 22 Recovery Unit, which is kind of headed by

Page 327 Lieutenant -- and Brad's online coming up with 1 2 contingency on how we're going to get stuff to Hawaii although the harbor is down. 3 And one of those has to do with using Pearl Harbor and 4 some of their facilities. And a part of that 5 conversation has been if we wanted to get the 6 7 port open without any salvaging, it has side-8 scan equipment that we could put on any boat. 9 And they've agreed to let us use that provided there's not a national defense mission. 10 You know, they wouldn't use it to update any 11 12 charts, but that would be a tool that a Captain of the Port would use it, you know at 13 14 her discretion, it's available. But there's -- you know, it's a liability thing. 15 They're 16 going to provide even the operator. But he's 17 not going to say "Oh, yes, the channel's 18 clear." You know, that's up to the Captain of 19 the Port. But we do have some assets here, 20 but not like at NRT. 21 CHAIR WELCH: Okay. And let's 22 have a comment from the Corps of Engineers.

|    | Page 328                                      |
|----|---|
| 1  | Why don't you come on up? And speak into a    |
| 2  | mic, if you would please.                     |
| 3  | MS. PODOSKI: My name is Jessica               |
| 4  | Podoski, I'm from the Corps of Engineers, so  |
| 5  | I just wanted to address that.                |
| 6  | We don't have side-scanners on our            |
| 7  | capability locally. Typically Portland        |
| 8  | District is our survey office. And they come  |
| 9  | over. We just don't do enough out here to     |
| 10 | maintain that equipment.                      |
| 11 | CHAIR WELCH: Thanks.                          |
| 12 | Okay. Joyce Miller had her hand               |
| 13 | up.   |
| 14 | MEMBER MILLER: There is a multi-              |
| 15 | beam capable launch out here. It's used for   |
| 16 | Benthic Habitat mapping. It sits in the Port  |
| 17 | of Honolulu at Pier 45. It's a NOAA vessel.   |
| 18 | Again, it's a question of habitat mapping     |
| 19 | versus nautical charting. This launch was     |
| 20 | used to make the Honolulu Harbor recent       |
| 21 | survey. In collaboration with Coast Survey    |
| 22 | they sent people out here to run it or to run |

|    | Page 329                                     |
|----|--|
| 1  | the survey, the launch was used. And the     |
| 2  | person that's in charge of the launch right  |
| 3  | now will be here on Friday, Dr. John Rooney. |
| 4  | But it's something that's in discussion with |
| 5  | Coast Survey.                                |
| 6  | We've also used in Rota, Tinian              |
| 7  | and Saipan harbors for official charting     |
| 8  | surveys.                                     |
| 9  | So it is capable of that, but it's           |
| 10 | an asset that's funded by primarily habitat  |
| 11 | mapping for the coral program.               |
| 12 | So we've had various discussions             |
| 13 | with Lieutenant Ryan and so forth about how  |
| 14 | better to possibly use that asset here       |
| 15 | locally. And also with Army Corps and also   |
| 16 | with Coast Survey. You know, a variety of    |
| 17 | groups.                                      |
| 18 | CHAIR WELCH: Okay. Yes, if you               |
| 19 | could identify yourself and make a comment,  |
| 20 | that's be great.                             |
| 21 | MR. BALSER: Yes. just a quick                |
| 22 | remark. My name is Richard Balser. I'm with  |
|    |  |

Page 330 1 PACFLT but representing the Naval Metrology 2 and Oceanography Command. And one of their assets is the 3 Fleet Survey Team, which is specifically on a 4 5 fly away team recall during the hurricane 6 With 48 hours notice they can be out season. 7 to wherever displaced with their fly away 8 capability, which includes either a boat 9 opportunity or one of their boats that 10 includes side-scan sonar and multi-beam capability. And we have that coordinated 11 12 through Pearl Harbor through Emergency 13 Operations. 14 If there is an event requiring rapid port clearance, that's a viable option 15 16 for executing a rapid turnaround survey. 17 CHAIR WELCH: Okay. Good. Thank 18 you. 19 Robin, I wonder if do you ever as 20 part of HOST ever have sort of themes to your 21 meeting and would a theme be trying to bring 22 all the various people that have interest in

| Page 331         1       this or possible assets and discussing some         2       kind of cooperative arrangement -         3       MR. BOND: Yes. Basically, that         4       is one of the things that HOST tries to do is         5       act as a forum to bring groups together. So         6       if something comes up where we need to get the         7       Navy and the Coast Guard and maritime group         8       together, we can do that. In fact, we did it         9       just recently, we've done that type of thing.         10       So, yes, we can do it to answer your question.         11       CHAIR WELCH: All right.         12       MEMBER MILLER: One comment about         13       Robin's question about marine debris. There         14       is a NOAA Office of Marine Debris. I mean,         15       you can simply Google it. It's quite easy.         16       But there's also a group here that actively         17       takes marine debris out of the northwestern         18       Hawaiian Islands, and also locally. It's a         19       NOAA group.         20       And so I can't say I haven't been         21       in touch with them. But, you know if anybody         22       were bracing for this onslaught of |    |  |
|---|----|--|
| 2kind of cooperative arrangement -3MR. BOND: Yes. Basically, that4is one of the things that HOST tries to do is5act as a forum to bring groups together. So6if something comes up where we need to get the7Navy and the Coast Guard and maritime group8together, we can do that. In fact, we did it9just recently, we've done that type of thing.10So, yes, we can do it to answer your question.11CHAIR WELCH: All right.12MEMBER MILLER: One comment about13Robin's question about marine debris. There14is a NOAA Office of Marine Debris. I mean,15you can simply Google it. It's quite easy.16But there's also a group here that actively17takes marine debris out of the northwestern18Hawaiian Islands, and also locally. It's a19NOAA group.20And so I can't say I haven't been21in touch with them. But, you know if anybody   |    | Page 331                                       |
| 3MR. BOND: Yes. Basically, that4is one of the things that HOST tries to do is5act as a forum to bring groups together. So6if something comes up where we need to get the7Navy and the Coast Guard and maritime group8together, we can do that. In fact, we did it9just recently, we've done that type of thing.10So, yes, we can do it to answer your question.11CHAIR WELCH: All right.12MEMBER MILLER: One comment about13Robin's question about marine debris. There14is a NOAA Office of Marine Debris. I mean,15you can simply Google it. It's quite easy.16But there's also a group here that actively17takes marine debris out of the northwestern18Hawaiian Islands, and also locally. It's a19NOAA group.20And so I can't say I haven't been21in touch with them. But, you know if anybody   | 1  | this or possible assets and discussing some    |
| <ul> <li>is one of the things that HOST tries to do is</li> <li>act as a forum to bring groups together. So</li> <li>if something comes up where we need to get the</li> <li>Navy and the Coast Guard and maritime group</li> <li>together, we can do that. In fact, we did it</li> <li>just recently, we've done that type of thing.</li> <li>So, yes, we can do it to answer your question.</li> <li>CHAIR WELCH: All right.</li> <li>Robin's question about marine debris. There</li> <li>is a NOAA Office of Marine Debris. I mean,</li> <li>you can simply Google it. It's quite easy.</li> <li>But there's also a group here that actively</li> <li>takes marine debris out of the northwestern</li> <li>Hawaiian Islands, and also locally. It's a</li> <li>NOAA group.</li> <li>And so I can't say I haven't been</li> <li>in touch with them. But, you know if anybody</li> </ul>  | 2  | kind of cooperative arrangement -              |
| 5       act as a forum to bring groups together. So         6       if something comes up where we need to get the         7       Navy and the Coast Guard and maritime group         8       together, we can do that. In fact, we did it         9       just recently, we've done that type of thing.         10       So, yes, we can do it to answer your question.         11       CHAIR WELCH: All right.         12       MEMBER MILLER: One comment about         13       Robin's question about marine debris. There         14       is a NOAA Office of Marine Debris. I mean,         15       you can simply Google it. It's quite easy.         16       But there's also a group here that actively         17       takes marine debris out of the northwestern         18       Hawaiian Islands, and also locally. It's a         19       NOAA group.         20       And so I can't say I haven't been         21       in touch with them. But, you know if anybody   | 3  | MR. BOND: Yes. Basically, that                 |
| <ul> <li>if something comes up where we need to get the</li> <li>Navy and the Coast Guard and maritime group</li> <li>together, we can do that. In fact, we did it</li> <li>just recently, we've done that type of thing.</li> <li>So, yes, we can do it to answer your question.</li> <li>CHAIR WELCH: All right.</li> <li>MEMBER MILLER: One comment about</li> <li>Robin's question about marine debris. There</li> <li>is a NOAA Office of Marine Debris. I mean,</li> <li>you can simply Google it. It's quite easy.</li> <li>But there's also a group here that actively</li> <li>takes marine debris out of the northwestern</li> <li>Hawaiian Islands, and also locally. It's a</li> <li>NOAA group.</li> <li>And so I can't say I haven't been</li> <li>in touch with them. But, you know if anybody</li> </ul>  | 4  | is one of the things that HOST tries to do is  |
| <ul> <li>Navy and the Coast Guard and maritime group</li> <li>together, we can do that. In fact, we did it</li> <li>just recently, we've done that type of thing.</li> <li>So, yes, we can do it to answer your question.</li> <li>CHAIR WELCH: All right.</li> <li>MEMBER MILLER: One comment about</li> <li>Robin's question about marine debris. There</li> <li>is a NOAA Office of Marine Debris. I mean,</li> <li>you can simply Google it. It's quite easy.</li> <li>But there's also a group here that actively</li> <li>takes marine debris out of the northwestern</li> <li>Hawaiian Islands, and also locally. It's a</li> <li>NOAA group.</li> <li>And so I can't say I haven't been</li> <li>in touch with them. But, you know if anybody</li> </ul>  | 5  | act as a forum to bring groups together. So    |
| <ul> <li>together, we can do that. In fact, we did it</li> <li>just recently, we've done that type of thing.</li> <li>So, yes, we can do it to answer your question.</li> <li>CHAIR WELCH: All right.</li> <li>MEMBER MILLER: One comment about</li> <li>Robin's question about marine debris. There</li> <li>is a NOAA Office of Marine Debris. I mean,</li> <li>you can simply Google it. It's quite easy.</li> <li>But there's also a group here that actively</li> <li>takes marine debris out of the northwestern</li> <li>Hawaiian Islands, and also locally. It's a</li> <li>NOAA group.</li> <li>And so I can't say I haven't been</li> <li>in touch with them. But, you know if anybody</li> </ul>   | 6  | if something comes up where we need to get the |
| <ul> <li>just recently, we've done that type of thing.</li> <li>So, yes, we can do it to answer your question.</li> <li>CHAIR WELCH: All right.</li> <li>MEMBER MILLER: One comment about</li> <li>Robin's question about marine debris. There</li> <li>is a NOAA Office of Marine Debris. I mean,</li> <li>you can simply Google it. It's quite easy.</li> <li>But there's also a group here that actively</li> <li>takes marine debris out of the northwestern</li> <li>Hawaiian Islands, and also locally. It's a</li> <li>NOAA group.</li> <li>And so I can't say I haven't been</li> <li>in touch with them. But, you know if anybody</li> </ul>   | 7  | Navy and the Coast Guard and maritime group    |
| <ul> <li>So, yes, we can do it to answer your question.</li> <li>CHAIR WELCH: All right.</li> <li>MEMBER MILLER: One comment about</li> <li>Robin's question about marine debris. There</li> <li>is a NOAA Office of Marine Debris. I mean,</li> <li>you can simply Google it. It's quite easy.</li> <li>But there's also a group here that actively</li> <li>takes marine debris out of the northwestern</li> <li>Hawaiian Islands, and also locally. It's a</li> <li>NOAA group.</li> <li>And so I can't say I haven't been</li> <li>in touch with them. But, you know if anybody</li> </ul>  | 8  | together, we can do that. In fact, we did it   |
| 11CHAIR WELCH: All right.12MEMBER MILLER: One comment about13Robin's question about marine debris. There14is a NOAA Office of Marine Debris. I mean,15you can simply Google it. It's quite easy.16But there's also a group here that actively17takes marine debris out of the northwestern18Hawaiian Islands, and also locally. It's a19NOAA group.20And so I can't say I haven't been21in touch with them. But, you know if anybody  | 9  | just recently, we've done that type of thing.  |
| 12 MEMBER MILLER: One comment about<br>13 Robin's question about marine debris. There<br>14 is a NOAA Office of Marine Debris. I mean,<br>15 you can simply Google it. It's quite easy.<br>16 But there's also a group here that actively<br>17 takes marine debris out of the northwestern<br>18 Hawaiian Islands, and also locally. It's a<br>19 NOAA group.<br>20 And so I can't say I haven't been<br>21 in touch with them. But, you know if anybody   | 10 | So, yes, we can do it to answer your question. |
| <ul> <li>Robin's question about marine debris. There</li> <li>is a NOAA Office of Marine Debris. I mean,</li> <li>you can simply Google it. It's quite easy.</li> <li>But there's also a group here that actively</li> <li>takes marine debris out of the northwestern</li> <li>Hawaiian Islands, and also locally. It's a</li> <li>NOAA group.</li> <li>And so I can't say I haven't been</li> <li>in touch with them. But, you know if anybody</li> </ul>   | 11 | CHAIR WELCH: All right.                        |
| 14 is a NOAA Office of Marine Debris. I mean,<br>15 you can simply Google it. It's quite easy.<br>16 But there's also a group here that actively<br>17 takes marine debris out of the northwestern<br>18 Hawaiian Islands, and also locally. It's a<br>19 NOAA group.<br>20 And so I can't say I haven't been<br>21 in touch with them. But, you know if anybody  | 12 | MEMBER MILLER: One comment about               |
| <ul> <li>15 you can simply Google it. It's quite easy.</li> <li>16 But there's also a group here that actively</li> <li>17 takes marine debris out of the northwestern</li> <li>18 Hawaiian Islands, and also locally. It's a</li> <li>19 NOAA group.</li> <li>20 And so I can't say I haven't been</li> <li>21 in touch with them. But, you know if anybody</li> </ul>   | 13 | Robin's question about marine debris. There    |
| 16But there's also a group here that actively17takes marine debris out of the northwestern18Hawaiian Islands, and also locally. It's a19NOAA group.20And so I can't say I haven't been21in touch with them. But, you know if anybody  | 14 | is a NOAA Office of Marine Debris. I mean,     |
| <pre>17 takes marine debris out of the northwestern 18 Hawaiian Islands, and also locally. It's a 19 NOAA group. 20 And so I can't say I haven't been 21 in touch with them. But, you know if anybody</pre>   | 15 | you can simply Google it. It's quite easy.     |
| Hawaiian Islands, and also locally. It's a<br>NOAA group. And so I can't say I haven't been<br>in touch with them. But, you know if anybody   | 16 | But there's also a group here that actively    |
| 19 NOAA group. 20 And so I can't say I haven't been 21 in touch with them. But, you know if anybody   | 17 | takes marine debris out of the northwestern    |
| 20 And so I can't say I haven't been<br>21 in touch with them. But, you know if anybody   | 18 | Hawaiian Islands, and also locally. It's a     |
| 21 in touch with them. But, you know if anybody   | 19 | NOAA group.                                    |
|   | 20 | And so I can't say I haven't been              |
| 22 were bracing for this onslaught of marine  | 21 | in touch with them. But, you know if anybody   |
|   | 22 | were bracing for this onslaught of marine      |

|    | Page 332                                       |
|----|--|
| 1  | debris, it would be that office.               |
| 2  | MR. BOND: And I fully agree with               |
| 3  | that. And I've been involved with the          |
| 4  | northwest island cleanup since it began. I've  |
| 5  | been on that committee.                        |
| 6  | And what I said today, there was a             |
| 7  | meeting and I have no idea where the meeting   |
| 8  | was, but it was reported to me just at         |
| 9  | lunchtime that somebody, a very informed       |
| 10 | person, let somebody know, they called me that |
| 11 | NOAA had said they weren't planning on doing   |
| 12 | anything. And I don't really think that's      |
| 13 | going to happen, but I just want to let you    |
| 14 | folks know the importance to Hawaii for some   |
| 15 | kind of a heads-up or some kind of, I guess    |
| 16 | trying to figure out what goes on before it    |
| 17 | gets here and how important that's going to be |
| 18 | for us and allow us to prepare for it somehow. |
| 19 | I don't know how that's going to be.           |
| 20 | But thank you very much, and I                 |
| 21 | MEMBER MILLER: And I would                     |
| 22 | contact the Marine Debris folks.               |

|    | Page 333                                      |
|----|---|
| 1  | MR. BOND: Absolutely.                         |
| 2  | MEMBER MILLER: And they could let             |
| 3  | you know what's what.                         |
| 4  | MR. BOND: Yes, we do work with                |
| 5  | that group. Yes, we do.                       |
| 6  | CHAIR WELCH: Okay. I'd also like              |
| 7  | to acknowledge the presence here representing |
| 8  | the U.S. Navy, of Lieutenant Major. And thank |
| 9  | you for coming. He doesn't have any official  |
| 10 | remarks, I don't think. But I invited him.    |
| 11 | If we say something that inspires him or      |
| 12 | annoys him, to feel free to come up and       |
| 13 | participate in the discussion.                |
| 14 | We appreciate you being here.                 |
| 15 | Okay. Did we have some other                  |
| 16 | comments?                                     |
| 17 | Captain John.                                 |
| 18 | CAPT. LOWELL: To address Robin's              |
| 19 | comment. Number one, is the person who made   |
| 20 | that statement was me. And I spoke somewhat   |
| 21 | hastily and probably out of turn there. That  |
| 22 | was at a meeting we held over at the Pilot    |

Page 334 1 Station yesterday morning. 2 I guess I was aware of the marine debris coming. My notes coming out of that 3 meeting were pretty clear to myself that I was 4 5 willing to approach the Marine Debris -- and 6 get them involved and make sure they're aware. 7 I don't know what their thinking 8 is on this or how they're handling this, but 9 if they are actively working on this, then 10 they need to communicate out what it is they're doing, where it is they're going. 11 Ιf 12 they're not, well then that's maybe something they should think about. 13 14 So that's kind of my take away here on the marine debris issue. 15 16 MR. BOND: Thank you. 17 CAPT. LOWELL: And I Take full credit for the remarks. 18 19 CHAIR WELCH: He's a stand-up quy. 20 Gary Jeffress? 21 MEMBER JEFFRESS: Gary Jeffress. 22 Mr. Bond, what is the actual pre-

|    | Page 335                                       |
|----|--|
| 1  | concern about the marine debris? Is it         |
| 2  | navigation problem or is like a hazard for     |
| 3  | surfers, or is it just the fact that it's      |
| 4  | unsightly?                                     |
| 5  | MR. BOND: Yes, and more.                       |
| 6  | Actually, the way I would look at              |
| 7  | it if I were personally trying to give some    |
| 8  | idea, it's going to break up between Japan and |
| 9  | here. The house that you saw floating off of   |
| 10 | Japan, it's going to deteriorate to some       |
| 11 | degree. But there are large timbers, there     |
| 12 | are trees and we don't know if any of this     |
| 13 | stuff is radioactive, but we'll have to find   |
| 14 | out. But we don't know what it's going to be   |
| 15 | when it gets here.                             |
| 16 | Some of the information that I                 |
| 17 | have is that it can take up to years to get    |
| 18 | from one place to another. It gets caught in   |
| 19 | a gyre and, as you all know, it spins around   |
| 20 | for a while and then when the conditions are   |
| 21 | right, parts of it deflect off and come        |
| 22 | ashore.  |

| Page 3361Now it's going to affect our2tourism if it starts coming ashore in Waikiki.3If big things start coming ashore, it's going4to be a hazard to a small boats, maybe even5large vessels, I'm not sure. But if it's a6tree or a timber, it can be a hazard to large7vessels as well.8But we're concerned about just9knowing what it is so we can be ready. We can10work with the state and get them to understand11what's coming. And then we can have a plan in12place before it hits our beaches as to what we13want to do. A lot of times it's closing a14beach. And if something's coming ashore15I've actually closed a number of beaches16myself because of timbers and oil, and other17thing such as even box jellyfish, we closed18because of that.19So, it's just giving us a chance20in Hawaii to be prepared; that's all it is.21MEMBER MILLER: Well, there's the22other aspect of it also that, you know how  |    |  |
|---|----|--|
| <ul> <li>tourism if it starts coming ashore in Waikiki.</li> <li>If big things start coming ashore, it's going</li> <li>to be a hazard to a small boats, maybe even</li> <li>large vessels, I'm not sure. But if it's a</li> <li>tree or a timber, it can be a hazard to large</li> <li>vessels as well.</li> <li>But we're concerned about just</li> <li>knowing what it is so we can be ready. We can</li> <li>work with the state and get them to understand</li> <li>what's coming. And then we can have a plan in</li> <li>place before it hits our beaches as to what we</li> <li>want to do. A lot of times it's closing a</li> <li>beach. And if something's coming ashore</li> <li>I've actually closed a number of beaches</li> <li>myself because of timbers and oil, and other</li> <li>thing such as even box jellyfish, we closed</li> <li>because of that.</li> <li>So, it's just giving us a chance</li> <li>in Hawaii to be prepared; that's all it is.</li> <li>MEMBER MILLER: Well, there's the</li> </ul> |    | Page 336                                       |
| <ul> <li>If big things start coming ashore, it's going</li> <li>to be a hazard to a small boats, maybe even</li> <li>large vessels, I'm not sure. But if it's a</li> <li>tree or a timber, it can be a hazard to large</li> <li>vessels as well.</li> <li>But we're concerned about just</li> <li>knowing what it is so we can be ready. We can</li> <li>work with the state and get them to understand</li> <li>what's coming. And then we can have a plan in</li> <li>place before it hits our beaches as to what we</li> <li>want to do. A lot of times it's closing a</li> <li>beach. And if something's coming ashore</li> <li>I've actually closed a number of beaches</li> <li>myself because of timbers and oil, and other</li> <li>thing such as even box jellyfish, we closed</li> <li>because of that.</li> <li>So, it's just giving us a chance</li> <li>in Hawaii to be prepared; that's all it is.</li> <li>MEMBER MILLER: Well, there's the</li> </ul>   | 1  | Now it's going to affect our                   |
| <ul> <li>to be a hazard to a small boats, maybe even</li> <li>large vessels, I'm not sure. But if it's a</li> <li>tree or a timber, it can be a hazard to large</li> <li>vessels as well.</li> <li>But we're concerned about just</li> <li>knowing what it is so we can be ready. We can</li> <li>work with the state and get them to understand</li> <li>what's coming. And then we can have a plan in</li> <li>place before it hits our beaches as to what we</li> <li>want to do. A lot of times it's closing a</li> <li>beach. And if something's coming ashore</li> <li>I've actually closed a number of beaches</li> <li>myself because of timbers and oil, and other</li> <li>thing such as even box jellyfish, we closed</li> <li>because of that.</li> <li>So, it's just giving us a chance</li> <li>in Hawaii to be prepared; that's all it is.</li> <li>MEMBER MILLER: Well, there's the</li> </ul>  | 2  | tourism if it starts coming ashore in Waikiki. |
| <ul> <li>large vessels, I'm not sure. But if it's a</li> <li>tree or a timber, it can be a hazard to large</li> <li>vessels as well.</li> <li>But we're concerned about just</li> <li>knowing what it is so we can be ready. We can</li> <li>work with the state and get them to understand</li> <li>what's coming. And then we can have a plan in</li> <li>place before it hits our beaches as to what we</li> <li>want to do. A lot of times it's closing a</li> <li>beach. And if something's coming ashore</li> <li>I've actually closed a number of beaches</li> <li>myself because of timbers and oil, and other</li> <li>thing such as even box jellyfish, we closed</li> <li>because of that.</li> <li>So, it's just giving us a chance</li> <li>in Hawaii to be prepared; that's all it is.</li> <li>MEMBER MILLER: Well, there's the</li> </ul>   | 3  | If big things start coming ashore, it's going  |
| 6 tree or a timber, it can be a hazard to large<br>7 vessels as well. 8 But we're concerned about just 9 knowing what it is so we can be ready. We can 10 work with the state and get them to understand 11 what's coming. And then we can have a plan in 12 place before it hits our beaches as to what we 13 want to do. A lot of times it's closing a 14 beach. And if something's coming ashore 15 I've actually closed a number of beaches 16 myself because of timbers and oil, and other 17 thing such as even box jellyfish, we closed 18 because of that. 19 So, it's just giving us a chance 20 in Hawaii to be prepared; that's all it is. 21 MEMBER MILLER: Well, there's the   | 4  | to be a hazard to a small boats, maybe even    |
| 7 vessels as well. 8 But we're concerned about just 9 knowing what it is so we can be ready. We can 10 work with the state and get them to understand 11 what's coming. And then we can have a plan in 12 place before it hits our beaches as to what we 13 want to do. A lot of times it's closing a 14 beach. And if something's coming ashore 15 I've actually closed a number of beaches 16 myself because of timbers and oil, and other 17 thing such as even box jellyfish, we closed 18 because of that. 19 So, it's just giving us a chance 20 in Hawaii to be prepared; that's all it is. 21 MEMBER MILLER: Well, there's the  | 5  | large vessels, I'm not sure. But if it's a     |
| 8 But we're concerned about just<br>9 knowing what it is so we can be ready. We can<br>10 work with the state and get them to understand<br>11 what's coming. And then we can have a plan in<br>12 place before it hits our beaches as to what we<br>13 want to do. A lot of times it's closing a<br>14 beach. And if something's coming ashore<br>15 I've actually closed a number of beaches<br>16 myself because of timbers and oil, and other<br>17 thing such as even box jellyfish, we closed<br>18 because of that.<br>19 So, it's just giving us a chance<br>20 in Hawaii to be prepared; that's all it is.<br>21 MEMBER MILLER: Well, there's the  | 6  | tree or a timber, it can be a hazard to large  |
| 9 knowing what it is so we can be ready. We can<br>work with the state and get them to understand<br>what's coming. And then we can have a plan in<br>place before it hits our beaches as to what we<br>want to do. A lot of times it's closing a<br>beach. And if something's coming ashore<br>I've actually closed a number of beaches<br>myself because of timbers and oil, and other<br>thing such as even box jellyfish, we closed<br>because of that. 19 So, it's just giving us a chance<br>in Hawaii to be prepared; that's all it is. 21 MEMBER MILLER: Well, there's the  | 7  | vessels as well.                               |
| 10 work with the state and get them to understand<br>11 what's coming. And then we can have a plan in<br>12 place before it hits our beaches as to what we<br>13 want to do. A lot of times it's closing a<br>14 beach. And if something's coming ashore<br>15 I've actually closed a number of beaches<br>16 myself because of timbers and oil, and other<br>17 thing such as even box jellyfish, we closed<br>18 because of that.<br>19 So, it's just giving us a chance<br>20 in Hawaii to be prepared; that's all it is.<br>21 MEMBER MILLER: Well, there's the   | 8  | But we're concerned about just                 |
| 11 what's coming. And then we can have a plan in<br>12 place before it hits our beaches as to what we<br>13 want to do. A lot of times it's closing a<br>14 beach. And if something's coming ashore<br>15 I've actually closed a number of beaches<br>16 myself because of timbers and oil, and other<br>17 thing such as even box jellyfish, we closed<br>18 because of that.<br>19 So, it's just giving us a chance<br>20 in Hawaii to be prepared; that's all it is.<br>21 MEMBER MILLER: Well, there's the  | 9  | knowing what it is so we can be ready. We can  |
| 12       place before it hits our beaches as to what we         13       want to do. A lot of times it's closing a         14       beach. And if something's coming ashore         15       I've actually closed a number of beaches         16       myself because of timbers and oil, and other         17       thing such as even box jellyfish, we closed         18       because of that.         19       So, it's just giving us a chance         20       in Hawaii to be prepared; that's all it is.         21       MEMBER MILLER: Well, there's the   | 10 | work with the state and get them to understand |
| <ul> <li>want to do. A lot of times it's closing a</li> <li>beach. And if something's coming ashore</li> <li>I've actually closed a number of beaches</li> <li>myself because of timbers and oil, and other</li> <li>thing such as even box jellyfish, we closed</li> <li>because of that.</li> <li>So, it's just giving us a chance</li> <li>in Hawaii to be prepared; that's all it is.</li> <li>MEMBER MILLER: Well, there's the</li> </ul>  | 11 | what's coming. And then we can have a plan in  |
| 14 beach. And if something's coming ashore<br>15 I've actually closed a number of beaches<br>16 myself because of timbers and oil, and other<br>17 thing such as even box jellyfish, we closed<br>18 because of that.<br>19 So, it's just giving us a chance<br>20 in Hawaii to be prepared; that's all it is.<br>21 MEMBER MILLER: Well, there's the   | 12 | place before it hits our beaches as to what we |
| 15 I've actually closed a number of beaches<br>myself because of timbers and oil, and other<br>thing such as even box jellyfish, we closed<br>because of that. 19 So, it's just giving us a chance<br>in Hawaii to be prepared; that's all it is. 21 MEMBER MILLER: Well, there's the   | 13 | want to do. A lot of times it's closing a      |
| 16 myself because of timbers and oil, and other<br>17 thing such as even box jellyfish, we closed<br>18 because of that.<br>19 So, it's just giving us a chance<br>20 in Hawaii to be prepared; that's all it is.<br>21 MEMBER MILLER: Well, there's the  | 14 | beach. And if something's coming ashore        |
| <pre>17 thing such as even box jellyfish, we closed<br/>18 because of that.<br/>19 So, it's just giving us a chance<br/>20 in Hawaii to be prepared; that's all it is.<br/>21 MEMBER MILLER: Well, there's the</pre>  | 15 | I've actually closed a number of beaches       |
| <pre>18 because of that.<br/>19 So, it's just giving us a chance<br/>20 in Hawaii to be prepared; that's all it is.<br/>21 MEMBER MILLER: Well, there's the</pre>   | 16 | myself because of timbers and oil, and other   |
| So, it's just giving us a chance<br>in Hawaii to be prepared; that's all it is.<br>MEMBER MILLER: Well, there's the   | 17 | thing such as even box jellyfish, we closed    |
| <ul> <li>in Hawaii to be prepared; that's all it is.</li> <li>MEMBER MILLER: Well, there's the</li> </ul>   | 18 | because of that.                               |
| 21 MEMBER MILLER: Well, there's the   | 19 | So, it's just giving us a chance               |
|   | 20 | in Hawaii to be prepared; that's all it is.    |
| 22 other aspect of it also that, you know how   | 21 | MEMBER MILLER: Well, there's the               |
|   | 22 | other aspect of it also that, you know how     |

|    | Page 337                                       |
|----|--|
| 1  | much plastic is washed out to sea? And for     |
| 2  | our sea life, I don't know if you've seen some |
| 3  | of the pictures from Midway and so forth,      |
| 4  | these birds that just stuffed full of little   |
| 5  | plastic pieces or monk seals and turtles that  |
| 6  | are entangled in nets and so forth. But you    |
| 7  | know, that's more up in the northwestern       |
| 8  | Hawaiian Islands. But I can't imagine how      |
| 9  | much, you know besides trees and houses, how   |
| 10 | much plastic was washed into the ocean and is  |
| 11 | going to end up on somebody's shores.          |
| 12 | CHAIR WELCH: Okay. Other                       |
| 13 | comments or questions from Panelists?          |
| 14 | Let me ask a couple of questions,              |
| 15 | if I could.                                    |
| 16 | Captain Steve, on some of the                  |
| 17 | pilotage comments you made. When you have      |
| 18 | large cruise ships like the NCL interisland    |
| 19 | cruise ship, is it using a pilot each time it  |
| 20 | enters the harbor or each pilot each day?      |
| 21 | CAPT. BAKER: We work with them in              |
| 22 | the beginning when they started. But they are  |
|    |  |

|    | Page 338                                       |
|----|--|
| 1  | a U.S. flag vessel. It's one of the only       |
| 2  | large ships that are registered that way, so   |
| 3  | they have a U.S. crew. Officers are U.S.       |
| 4  | citizens with licenses. And after they've      |
| 5  | made their trips and obtained the number of    |
| 6  | round trips they needed, they began getting    |
| 7  | their own pilotage and now they do all their   |
| 8  | own work.                                      |
| 9  | CHAIR WELCH: Well, what happens                |
| 10 | with the foreign-flagged ship that comes in    |
| 11 | from Mexico and then does an interisland       |
| 12 | CAPT. BAKER: Yes. Any other                    |
| 13 | foreign-flagged vessel is required to take a   |
| 14 | state pilot.                                   |
| 15 | CHAIR WELCH: Since they're                     |
| 16 | entering a port, the way I understand it       |
| 17 | virtually everyday, does your pilot just stay  |
| 18 | on the ship?                                   |
| 19 | CAPT. BAKER: Yes. If the ports                 |
| 20 | are in succession, we don't have layday in     |
| 21 | between. We don't do the anchorage ports.      |
| 22 | And they do go and anchor off of Liana and off |

|    | Page 339                                       |
|----|--|
| 1  | Kona. And those are not state pilotage         |
| 2  | waters. So if they've got that in between,     |
| 3  | we'll be getting off because we don't stay on  |
| 4  | board for that week. But otherwise, I just did |
| 5  | two weeks in the neighbor islands. I was on    |
| 6  | the Carnival Spirit for several days. And      |
| 7  | that usually lends to my wife accusing me of   |
| 8  | not working.                                   |
| 9  | CHAIR WELCH: How many actual                   |
| 10 | ports are there in the state, or about?        |
| 11 | CAPT. BAKER: Well, there's two on              |
| 12 | Oahu. Two on Kauai, one of which we don't      |
| 13 | have any deep draft traffic going into the     |
| 14 | port, which is Port Allen. We used to until    |
| 15 | 1992 when they had the hurricane at that time, |
| 16 | there was damage to the main pier there and    |
| 17 | it's never been repaired. So, that's all small |
| 18 | boat traffic into that harbor now.             |
| 19 | Maui only has one port deep draft.             |
| 20 | That's Kahalui. And then we have two on the    |
| 21 | Big Island, which is Hilo on one side and then |
| 22 | on the northwest at the top is Kawaihae. And   |

Page 340 1 we provide services to all those ports. 2 CHAIR WELCH: Okay. Thank you. And the Matson cattle ships, are 3 you still running Matson cattle ships? 4 5 CAPT. LAMB: Well, we bring the 6 livestock from the neighbor islands to 7 Honolulu by barge or vice versa if they're 8 coming from the mainland and going to the 9 islands. And for some reason, it goes both 10 ways. 11 CHAIR WELCH: We're not visiting a 12 cattle ship tomorrow? 13 CAPT. BAKER: They do bring No. 14 pigs on a regular basis, though, to the 15 island. Live pig. 16 CAPT. LAMB: Yes. We'll bring 17 horses, cattle, goats, sheep, dogs out here. Mostly the other way I've only heard of cattle 18 19 going out. But, yes, we still do that. 20 And the Mahi Mahi, I don't know if 21 they're bringing any in tomorrow, but as we 22 drive through the terminal if there's any,

Page 341 1 I'll point them to you. They're easy to spot, 2 those containers. 3 CHAIR WELCH: Okay. Is there still a Lurline in the Matson fleet? 4 5 CAPT. LAMB: The Lurline is laid up right now in Oakland. 6 7 CHAIR WELCH: Okay. 8 CAPT. LAMB: And we have a couple 9 of ships in lay-up status, two right now. And they're there for shipyard reliefs of vessels 10 when they go to the yards. 11 12 CHAIR WELCH: Okay. 13 MR. RIMMEL: I got a funny sea 14 story to tell you about cattle barges if you want to hear it on a break. 15 CHAIR WELCH: You don't think we 16 17 ought to put it officially on the record? MR. RIMMEL: There's some colorful 18 19 language. 20 CHAIR WELCH: Okay. Brad, can you 21 give us a little bit more. I'm not sure we're 22 going to officially see a tow and barge

|    | Page 342                                       |
|----|--|
| 1  | combination tomorrow. Maybe we will            |
| 2  | incidentally. But can you sort of draw a       |
| 3  | picture with words for some of us as to types  |
| 4  | of vessels and barges, tows that you run?      |
| 5  | MR. RIMMEL: The tug and barge                  |
| 6  | industry here handles all a good into the      |
| 7  | 90 percentile easily of cargo arriving in      |
| 8  | we like to call them outside islands from here |
| 9  | on Oahu. But if we were sitting on Kauai       |
| 10 | right now, they would call us an outside       |
| 11 | island.  |
| 12 | All the fuel, for example, goes                |
| 13 | from Honolulu to all the islands. All the      |
| 14 | fuel that they receive is by barge.            |
| 15 | The great majority of the cargo                |
| 16 | going to Maui, the Big Island, Molokai, Lanai  |
| 17 | and Kauai is all by barge.                     |
| 18 | Now, Young Brothers is a primary               |
| 19 | mover of general cargo, and they're controlled |
| 20 | by the PUC, the Public Utilities Commission,   |
| 21 | and they have their tugs that tow them. They   |
| 22 | have a regular tariff scheduled and rate that  |

they provide. 1 2 We at Sause Bros are contracting 3 out boats out to Matson. We haul the petroleum barge for Gasco. We haul a fuel barge for 4 5 Chevron, a 65,000 barrel barge, mostly clean product, nav gas, diesel and your unleaded and 6 7 premium gas for the cars and gas stations. 8 Tesoro has a group that is taken 9 care of by KC Towing. You may have heard of 10 They were just bought out here recently them. by Kirby. But that's all by barge also, which 11 12 is bunker fuels for the electric plants for Miko and Hiko and the Big Island, Niihau and 13 14 Maui. Kauai gets it from them also. The scheduling is critical. 15 If we 16 have weather systems, and they don't have to be extreme weather, but as Captain Steve 17 18 mentioned, if you have a weather time, the 19 north swell which the surfers love to death an 20 you've all heard about it in Waimea and Makaha 21 and Sunset Beach. But when those waves come 22 in, it closes out Kahalui, for example. And

| Page 3441if you don't get into Kahalui, that's your2only commercial port on Maui. And if they3don't get fuel in there, if they miss two4weeks, they start running out and it gets5critical. Really critical.6One of the big problems we're7experiencing also is berth availability. And8a lot of our vessels from when I first9started, we used to double tow all the time10with barges averaging between 240 to 26011280 feet. Now we have barges in the 300s.12They're talking about bringing in barges now13of 400 feet. Now you're competing with the14passenger ships. You're competing with the15fuel barges that are bigger. The first fuel16barge that I towed over here was only it17was a big barge, a 55,000 barrel barge, now we18got 65,000 barrel and upwards to 70. And it's19just the berthing becomes a real nightmare.20If something happens because of21weather, everything just starts snapping up in22respect to, you know to your swells and surges |    |  |
|---|----|--|
| 2only commercial port on Maui. And if they3don't get fuel in there, if they miss two4weeks, they start running out and it gets5critical. Really critical.6One of the big problems we're7experiencing also is berth availability. And8a lot of our vessels from when I first9started, we used to double tow all the time10with barges averaging between 240 to 26011280 feet. Now we have barges in the 300s.12They're talking about bringing in barges now13of 400 feet. Now you're competing with the14passenger ships. You're competing with the15fuel barges that are bigger. The first fuel16barge that I towed over here was only it17was a big barge, a 55,000 barrel barge, now we18got 65,000 barrel and upwards to 70. And it's19just the berthing becomes a real nightmare.20If something happens because of21weather, everything just starts snapping up in  |    | Page 344                                       |
| 3don't get fuel in there, if they miss two4weeks, they start running out and it gets5critical. Really critical.6One of the big problems we're7experiencing also is berth availability. And8a lot of our vessels from when I first9started, we used to double tow all the time10with barges averaging between 240 to 26011280 feet. Now we have barges in the 300s.12They're talking about bringing in barges now13of 400 feet. Now you're competing with the14passenger ships. You're competing with the15fuel barges that are bigger. The first fuel16barge that I towed over here was only it17was a big barge, a 55,000 barrel barge, now we18got 65,000 barrel and upwards to 70. And it's19just the berthing becomes a real nightmare.20If something happens because of21weather, everything just starts snapping up in  | 1  | if you don't get into Kahalui, that's your     |
| <ul> <li>weeks, they start running out and it gets</li> <li>critical. Really critical.</li> <li>One of the big problems we're</li> <li>experiencing also is berth availability. And</li> <li>a lot of our vessels from when I first</li> <li>started, we used to double tow all the time</li> <li>with barges averaging between 240 to 260</li> <li>280 feet. Now we have barges in the 300s.</li> <li>They're talking about bringing in barges now</li> <li>of 400 feet. Now you're competing with the</li> <li>passenger ships. You're competing with the</li> <li>fuel barges that are bigger. The first fuel</li> <li>barge that I towed over here was only it</li> <li>was a big barge, a 55,000 barrel barge, now we</li> <li>got 65,000 barrel and upwards to 70. And it's</li> <li>just the berthing becomes a real nightmare.</li> <li>If something happens because of</li> <li>weather, everything just starts snapping up in</li> </ul>                        | 2  | only commercial port on Maui. And if they      |
| 5critical. Really critical.6One of the big problems we're7experiencing also is berth availability. And8a lot of our vessels from when I first9started, we used to double tow all the time10with barges averaging between 240 to 26011280 feet. Now we have barges in the 300s.12They're talking about bringing in barges now13of 400 feet. Now you're competing with the14passenger ships. You're competing with the15fuel barges that are bigger. The first fuel16barge that I towed over here was only it17was a big barge, a 55,000 barrel barge, now we18got 65,000 barrel and upwards to 70. And it's19just the berthing becomes a real nightmare.20If something happens because of21weather, everything just starts snapping up in  | 3  | don't get fuel in there, if they miss two      |
| 6 One of the big problems we're<br>7 experiencing also is berth availability. And<br>8 a lot of our vessels from when I first<br>9 started, we used to double tow all the time<br>10 with barges averaging between 240 to 260<br>11 280 feet. Now we have barges in the 300s.<br>12 They're talking about bringing in barges now<br>13 of 400 feet. Now you're competing with the<br>14 passenger ships. You're competing with the<br>15 fuel barges that are bigger. The first fuel<br>16 barge that I towed over here was only it<br>17 was a big barge, a 55,000 barrel barge, now we<br>18 got 65,000 barrel and upwards to 70. And it's<br>19 just the berthing becomes a real nightmare.<br>20 If something happens because of<br>21 weather, everything just starts snapping up in   | 4  | weeks, they start running out and it gets      |
| experiencing also is berth availability. And a lot of our vessels from when I first started, we used to double tow all the time with barges averaging between 240 to 260 280 feet. Now we have barges in the 300s. They're talking about bringing in barges now of 400 feet. Now you're competing with the passenger ships. You're competing with the fuel barges that are bigger. The first fuel barge that I towed over here was only it was a big barge, a 55,000 barrel barge, now we got 65,000 barrel and upwards to 70. And it's just the berthing becomes a real nightmare. If something happens because of weather, everything just starts snapping up in  | 5  | critical. Really critical.                     |
| 8a lot of our vessels from when I first9started, we used to double tow all the time10with barges averaging between 240 to 26011280 feet. Now we have barges in the 300s.12They're talking about bringing in barges now13of 400 feet. Now you're competing with the14passenger ships. You're competing with the15fuel barges that are bigger. The first fuel16barge that I towed over here was only it17was a big barge, a 55,000 barrel barge, now we18got 65,000 barrel and upwards to 70. And it's19just the berthing becomes a real nightmare.20If something happens because of21weather, everything just starts snapping up in  | 6  | One of the big problems we're                  |
| <ul> <li>started, we used to double tow all the time</li> <li>with barges averaging between 240 to 260</li> <li>280 feet. Now we have barges in the 300s.</li> <li>They're talking about bringing in barges now</li> <li>of 400 feet. Now you're competing with the</li> <li>passenger ships. You're competing with the</li> <li>fuel barges that are bigger. The first fuel</li> <li>barge that I towed over here was only it</li> <li>was a big barge, a 55,000 barrel barge, now we</li> <li>got 65,000 barrel and upwards to 70. And it's</li> <li>just the berthing becomes a real nightmare.</li> <li>If something happens because of</li> <li>weather, everything just starts snapping up in</li> </ul>  | 7  | experiencing also is berth availability. And   |
| with barges averaging between 240 to 260<br>280 feet. Now we have barges in the 300s.<br>They're talking about bringing in barges now<br>of 400 feet. Now you're competing with the<br>passenger ships. You're competing with the<br>fuel barges that are bigger. The first fuel<br>barge that I towed over here was only it<br>was a big barge, a 55,000 barrel barge, now we<br>got 65,000 barrel and upwards to 70. And it's<br>just the berthing becomes a real nightmare.<br>If something happens because of<br>weather, everything just starts snapping up in   | 8  | a lot of our vessels from when I first         |
| 11 280 feet. Now we have barges in the 300s. 12 They're talking about bringing in barges now 13 of 400 feet. Now you're competing with the 14 passenger ships. You're competing with the 15 fuel barges that are bigger. The first fuel 16 barge that I towed over here was only it 17 was a big barge, a 55,000 barrel barge, now we 18 got 65,000 barrel and upwards to 70. And it's 19 just the berthing becomes a real nightmare. 20 If something happens because of 21 weather, everything just starts snapping up in  | 9  | started, we used to double tow all the time    |
| 12 They're talking about bringing in barges now<br>13 of 400 feet. Now you're competing with the<br>14 passenger ships. You're competing with the<br>15 fuel barges that are bigger. The first fuel<br>16 barge that I towed over here was only it<br>17 was a big barge, a 55,000 barrel barge, now we<br>18 got 65,000 barrel and upwards to 70. And it's<br>19 just the berthing becomes a real nightmare.<br>20 If something happens because of<br>21 weather, everything just starts snapping up in  | 10 | with barges averaging between 240 to 260       |
| 13 of 400 feet. Now you're competing with the<br>14 passenger ships. You're competing with the<br>15 fuel barges that are bigger. The first fuel<br>16 barge that I towed over here was only it<br>17 was a big barge, a 55,000 barrel barge, now we<br>18 got 65,000 barrel and upwards to 70. And it's<br>19 just the berthing becomes a real nightmare.<br>20 If something happens because of<br>21 weather, everything just starts snapping up in   | 11 | 280 feet. Now we have barges in the 300s.      |
| 14 passenger ships. You're competing with the<br>15 fuel barges that are bigger. The first fuel<br>16 barge that I towed over here was only it<br>17 was a big barge, a 55,000 barrel barge, now we<br>18 got 65,000 barrel and upwards to 70. And it's<br>19 just the berthing becomes a real nightmare.<br>20 If something happens because of<br>21 weather, everything just starts snapping up in  | 12 | They're talking about bringing in barges now   |
| 15 fuel barges that are bigger. The first fuel<br>16 barge that I towed over here was only it<br>17 was a big barge, a 55,000 barrel barge, now we<br>18 got 65,000 barrel and upwards to 70. And it's<br>19 just the berthing becomes a real nightmare.<br>20 If something happens because of<br>21 weather, everything just starts snapping up in   | 13 | of 400 feet. Now you're competing with the     |
| 16 barge that I towed over here was only it<br>17 was a big barge, a 55,000 barrel barge, now we<br>18 got 65,000 barrel and upwards to 70. And it's<br>19 just the berthing becomes a real nightmare.<br>20 If something happens because of<br>21 weather, everything just starts snapping up in   | 14 | passenger ships. You're competing with the     |
| 17 was a big barge, a 55,000 barrel barge, now we<br>18 got 65,000 barrel and upwards to 70. And it's<br>19 just the berthing becomes a real nightmare.<br>20 If something happens because of<br>21 weather, everything just starts snapping up in  | 15 | fuel barges that are bigger. The first fuel    |
| <pre>18 got 65,000 barrel and upwards to 70. And it's 19 just the berthing becomes a real nightmare. 20 If something happens because of 21 weather, everything just starts snapping up in</pre>   | 16 | barge that I towed over here was only it       |
| 19 just the berthing becomes a real nightmare. 20 If something happens because of 21 weather, everything just starts snapping up in   | 17 | was a big barge, a 55,000 barrel barge, now we |
| <ul> <li>If something happens because of</li> <li>weather, everything just starts snapping up in</li> </ul>   | 18 | got 65,000 barrel and upwards to 70. And it's  |
| 21 weather, everything just starts snapping up in   | 19 | just the berthing becomes a real nightmare.    |
|   | 20 | If something happens because of                |
| 22 respect to, you know to your swells and surges   | 21 | weather, everything just starts snapping up in |
|   | 22 | respect to, you know to your swells and surges |

Page 345

and whatnot.

1

| 2  | The surge alone sometimes can keep             |
|----|--|
| 3  | fuel barges from discharging. We've found      |
| 4  | that to be a problem even with the container   |
| 5  | barges. You know, if you get more than a       |
| 6  | three foot surge in a self-loading discharging |
| 7  | container barge dropping those boxes down onto |
| 8  | the chassis it get a little precarious when    |
| 9  | you're doing all that type of thing.           |
| 10 | So when you folks give us a lot of             |
| 11 | this information, as I mentioned in Lanai, the |
| 12 | surges will either make or break your ability  |
| 13 | to get in or out of port. And some ports like  |
| 14 | Kaumalapau or Kaunakakai on Molokai, that type |
| 15 | of thing.                                      |
| 16 | So in scheduling it's just                     |
| 17 | critical. It's really critical. It's your      |
| 18 | warehouse system essentially for the stay.     |
| 19 | When you talk about heavy weather              |
| 20 | issues, we'll get underway with the tugs and   |
| 21 | barges a lot of times, but you know we'll just |
| 22 | end up doing circles off port waiting for the  |

|    | Page 346                                       |
|----|--|
| 1  | best window we can get to get in or out.       |
| 2  | The wind issues in Kawaihae become             |
| 3  | really, really important. It's not a real      |
| 4  | difficult port to get in and out with respect  |
| 5  | to maneuverability, but when you've got those  |
| 6  | strong trade winds, as I mentioned, with the   |
| 7  | islands and if it comes up on Kawaihae on the  |
| 8  | one side it's real dry. So during the day as   |
| 9  | the land heats up, sometimes you get, as the   |
| 10 | Aussies might say, these real willie-willie    |
| 11 | that just wants to come screaming down the     |
| 12 | mountain. You'll see this dust cloud starting  |
| 13 | to come. You know you got about 8 or 12        |
| 14 | minutes and then once it hits and wind will    |
| 15 | peak up to 30-35 knots like that.              |
| 16 | So the wind meters that we've                  |
| 17 | gotten inside Kawaihae Harbor have been really |
| 18 | helpfully because our guys coming off port are |
| 19 | shortening up tow a mile and a half out, and   |
| 20 | they're doing their best to look inside to see |
| 21 | what we got. But then we have people with      |
| 22 | cell phones now, which is great. My time we    |

|    | Page 347                                       |
|----|--|
| 1  | didn't have that. But you know you're finding  |
| 2  | out how's the wind inside. It's not uncommon   |
| 3  | sometimes when you go in there and here comes  |
| 4  | the wind, and you got to do a round circle and |
| 5  | get back out. Because, again, these barges     |
| 6  | have increased in size. And as any mariner     |
| 7  | knows, you got all that wind surface on        |
| 8  | container barges or some of these roll on/roll |
| 9  | off barges that are quite high, it's just      |
| 10 | you know, it just blows you right off the      |
| 11 | pier. You don't have a chance.                 |
| 12 | One of the issues we have in some              |
| 13 | of the commercial harbors, such as Kawaihae,   |
| 14 | a little bit in Barbers Point, you're sharing  |
| 15 | it with private users of the private boat      |
| 16 | community. So you have some issues with that.  |
| 17 | But that's nothing you folks really can do     |
| 18 | anything about. But it's just another issue    |
| 19 | we have to deal with.                          |
| 20 | If we've been Kawaihae before, we              |
| 21 | come in at night and some private boat came up |
| 22 | from Tahiti or southern California and decided |

Page 348 1 they're going to anchor up at Kawaihae Harbor 2 at 0300 and we show up at 0545 it's still dark, and what's that white little blurb over 3 And it's a sailboat. And the DLNR 4 there. 5 doesn't know a thing about it. You know, 6 that's always fun to deal with, you know that 7 type of things. 8 One of the things that Coast Guard 9 mentioned was the private needs aids in 10 navigation. Keehi Lagoon there's a range light that we had a wind storm a number of 11 12 years back. I want to say at least four or five years, but the aft range board fell down. 13 14 We have a channel that's only a 100 feet wide. We go in there with a 6,000 ton sand barge for 15 Ameron, it's a commercial pier but it's in a 16 17 private boat harbor. So the state is passing this hot potato back and forth with who is 18 19 responsible to fix it. And in the meantime we 20 still went to get in there with that barge. 21 And the board hasn't been fixed. And I don't 22 know what's going to happen with that. And

|    | Page 349                                      |
|----|---|
| 1  | that's a navigational aid issue.              |
| 2  | And we got very little in respect             |
| 3  | to navigational aids even in that channel.    |
| 4  | It's a skinny little channel, it's only 100   |
| 5  | feet wide, you know.                          |
| 6  | Scheduling. You asked me about                |
| 7  | that real quick. Young Brothers goes into     |
| 8  | Hilo twice a week. Kahului three times a      |
| 9  | week. We got into the Big Island with the     |
| 10 | Matson barges twice a week to Hilo, twice a   |
| 11 | week into Kawaihae. We go into Nawiliwili     |
| 12 | once a week, Kahului three times a week. And  |
| 13 | Kaumalapau with the fuel barge once every two |
| 14 | weeks. Into Kahului, Hilo with the fuel barge |
| 15 | once very week. We're throw in Kawaihae every |
| 16 | fourth week. Kaunakakai and Molokai once very |
| 17 | fourth week with that same fuel barge. And    |
| 18 | also in Port Allen on Kauai with the fuel     |
| 19 | barge. So that's just us for example.         |
| 20 | CHAIR WELCH: Okay. Good.                      |
| 21 | Yes, Captain?                                 |
| 22 | CAPT. LAMB: If I could, you asked             |
|    |   |

Page 350 about seeing a barge operation. When we're on 1 2 the dock tomorrow you will see two of our barges, the Haleakala and the Mauna Loa. Those 3 are both fully -- what's the word I'm looking 4 5 for? They have a container crane on them. I can't think of the word --6 7 MEMBER DIONNE: Self-contained. 8 CAPT. LAMB: Self-contained, yes. 9 Sure. And one of them if we get it out 10 on time, will leave at 10:30 tomorrow from the 11 12 Matson terminal. So we might actually see that pull away. I think we're scheduled to leave 13 14 here at 9:00. If the tour takes an hour on 15 the ship, we could be there when she's scheduled to leave. 16 17 There is an Aloha cargo transit 18 barge that's coming into Pier 1, and we can 19 probably see that operation if she's coming in 20 at 1100 tomorrow. So there is a chance we'll 21 see barges leaving the port. CHAIR WELCH: Well, I know back on 22

|    | Page 351                                      |
|----|---|
| 1  | the mainland there are extensive barge        |
| 2  | networks, both within the rivers and up and   |
| 3  | down the coast. And a lot of people just      |
| 4  | don't realize it. They think ships are ships  |
| 5  | and they don't understand seagoing barges and |
| 6  | that type of thing. And, of course, that's    |
| 7  | even more prominent in the transportation     |
| 8  | network here. And so it's another aspect of   |
| 9  | the commercial maritime transportation that - |
| 10 | _   |
| 11 | MR. RIMMEL: How many folks are                |
| 12 | going on this tour? Twenty, I think.          |
| 13 | CHAIR WELCH: Tomorrow?                        |
| 14 | MR. RIMMEL: Yes.                              |
| 15 | CHAIR WELCH: Yes, just pretty                 |
| 16 | much the folks you see sitting here at the    |
| 17 | table, I think.                               |
| 18 | Several of the panelists made some            |
| 19 | comments about the possible desirability of a |
| 20 | PORTS system in Hawaii, particularly in some  |
| 21 | of the features that you'd like to see. You   |
| 22 | know, this is something that this Panel has   |

|    | Page 352                                       |
|----|--|
| 1  | been talking with people in other locations,   |
| 2  | either nav port systems and would like them.   |
| 3  | And, you know, people that have been wanting   |
| 4  | them up until now who have sort of gotten      |
| 5  | their act together and pushed hard have been - |
| 6  | - NOAA's been pretty good in working with      |
| 7  | people to establish systems. But the key       |
| 8  | unanswered question for just about everybody   |
| 9  | is: How do you fund the maintenance? And       |
| 10 | NOAA has little, if any, money for that. And   |
| 11 | the trend of helping to contribute to          |
| 12 | maintenance for a few years, and that may have |
| 13 | been a budget roadblock. And there's no set    |
| 14 | template nationwide for what the local share   |
| 15 | of how the local folks raise their share;      |
| 16 | whether they get it through state              |
| 17 | appropriations or some kind of an assessment   |
| 18 | on the users. And it's sort of a glaring       |
| 19 | unanswered question of how the ports           |
| 20 | through the ports community.                   |
| 21 | And so if I had one thing to say               |
| 22 | to you all, if you could get your act together |

| Page 353                                       |
|--|
| on the maintenance money, you'd be able to     |
| make a much stronger case to the Federal       |
| Government about help in establishing them,    |
| even in these constrained Federal budget       |
| times.   |
| Rich, do you have any comment?                 |
| MR. EDWING: Yes.                               |
| CHAIR WELCH: It's within his                   |
| portfolio.                                     |
| MR. EDWING: Right. So we had                   |
| some discussions yesterday and the interest    |
| was expressed. But it sounds like there's      |
| some still some discussions going on locally   |
| about how many sensors and where, and knowing  |
| how much it's going to cost. So I certainly    |
| offered to provide assistance with somebody to |
| help maybe refine those requirements where you |
| really need stuff, give you some rough cost    |
| estimate, those sorts of things that can maybe |
| help you put together your business case, and  |
| also to share experiences from some of the     |
| other PORTS system, how they've gone about     |
|  |

|    | Page 354                                       |
|----|--|
| 1  | pursuing funding and try and get that part of  |
| 2  | it together as well.                           |
| 3  | So we're certainly more than glad              |
| 4  | to share those experiences with folks.         |
| 5  | CHAIR WELCH: There have been two               |
| 6  | or three economic studies, the most recent one |
| 7  | being up in the Columbia River about the       |
| 8  | economic case for having for a PORTS system.   |
| 9  | And you might want to, if you haven't seen it, |
| 10 | get those studies and see what they say about  |
| 11 | these other locations and see how that might   |
| 12 | relate to your local situation. Because that   |
| 13 | is the basis on which to make a credible case, |
| 14 | and they really have magnified economic        |
| 15 | benefits for this type of expenditure.         |
| 16 | MR. RIMMEL: And we hear you load               |
| 17 | and clear when it comes to the finance aspect  |
| 18 | of it. But one of the issues that we deal with |
| 19 | here is we don't have a port authority. I      |
| 20 | wish we did most of the time.                  |
| 21 | The Department of Transportation               |
| 22 | has three divisions within it: Airports,       |

|    | Page 355                                       |
|----|--|
|    |  |
| 1  | highways and then harbors. So it's strictly    |
| 2  | run by the state. So it's an issue. It's an    |
| 3  | issue of security, especially we've just been  |
| 4  | pretty successful with this security group or  |
| 5  | committee getting some grant money for that.   |
| 6  | I've had the opportunity to be involved with   |
| 7  | that committee. I'm also involved with the     |
| 8  | area Maritime Contingency Planning Committee   |
| 9  | and we talk about a lot of some of the other   |
| 10 | issues that you've brought up in respect to    |
| 11 | the respect to the availability of some of the |
| 12 | equipment to have to bear when we have to      |
| 13 | reopen the port because of an emergency and    |
| 14 | that type of thing that Kyle was talking       |
| 15 | about.   |
| 16 | But it's been a chore with                     |
| 17 | Department of Transportation and Harbors       |
| 18 | Division when it comes to that kind of stuff.  |
| 19 | I'll just say that.                            |
| 20 | CHAIR WELCH: Okay. Other                       |
| 21 | Panelists? No? Okay.                           |
| 22 | Captain Lowell?                                |

|    | Page 356                                       |
|----|--|
| 1  | CAPT. LOWELL: A couple of                      |
| 2  | questions.                                     |
| 3  | The HOST meetings that you put                 |
| 4  | together and organized. Can I assume that      |
| 5  | there's also the environmental side that's     |
| 6  | there and so they're bring in their concerns   |
| 7  | based on issues that are at hand?              |
| 8  | CAPT. LAMB: Yes. Our meetings,                 |
| 9  | we have a meeting once a month for the Board,  |
| 10 | and it's open to the public. And we do get     |
| 11 | people that just drop in. And our Board is     |
| 12 | made up of 14 individuals with backups. And    |
| 13 | it covers everything from recreational boating |
| 14 | to I'm a citizen. That's my position on it.    |
| 15 | And I don't know why I'm the Chairman, but     |
| 16 | partly because of him. But they're open.       |
| 17 | We try to get as much of the                   |
| 18 | maritime people as possible. And it does       |
| 19 | impact a lot on the environment as well as     |
| 20 | regular safety.                                |
| 21 | And we're not just the port safety             |
| 22 | team. We handle all the water as well between  |
|    |  |

| Page 1<br>1 the islands and around the islands. Anything<br>2 having to do with the ocean we get to do all<br>3 of that, which is kind of exciting and kind of<br>4 fun.<br>5 CAPT. LOWELL: Okay. Thank you<br>6 for that.<br>7 My next question would be<br>8 contrasting between what Brad was talking and<br>9 what Bob was talking about being on the ocean<br>10 current side. But what is cost involved in |
|--|
| having to do with the ocean we get to do all<br>of that, which is kind of exciting and kind of<br>fun. CAPT. LOWELL: Okay. Thank you for that. My next question would be contrasting between what Brad was talking and<br>what Bob was talking about being on the ocean  |
| <pre>3 of that, which is kind of exciting and kind of 4 fun. 5 CAPT. LOWELL: Okay. Thank you 6 for that. 7 My next question would be 8 contrasting between what Brad was talking and 9 what Bob was talking about being on the ocean</pre>   |
| 4 fun. 5 CAPT. LOWELL: Okay. Thank you 6 for that. 7 My next question would be 8 contrasting between what Brad was talking and 9 what Bob was talking about being on the ocean   |
| 5 CAPT. LOWELL: Okay. Thank you<br>6 for that.<br>7 My next question would be<br>8 contrasting between what Brad was talking and<br>9 what Bob was talking about being on the ocean  |
| 6 for that. 7 My next question would be 8 contrasting between what Brad was talking and 9 what Bob was talking about being on the ocean  |
| <ul> <li>My next question would be</li> <li>contrasting between what Brad was talking and</li> <li>what Bob was talking about being on the ocean</li> </ul>  |
| 8 contrasting between what Brad was talking and<br>9 what Bob was talking about being on the ocean   |
| 9 what Bob was talking about being on the ocean  |
|  |
| 10 current side. But what is cost involved in  |
|  |
| 11 one of the deeper ocean buoys? Is that  |
| 12 something that you've completed or is that  |
| 13 MR. EDWING: Well, that's really   |
| 14 NGDC the offshore ability that they've been   |
| 15 adding currents capabilities to.  |
| 16 CAPT. LOWELL: So between the  |
| 17 islands and any of these areas?   |
| 18 MR. EDWING: Well, and I'm   |
| 19 thinking there may be two possible solutions  |
| 20 between the islands. I don't know what HFR  |
| 21 assets are in place here. But you're looking  |
| 22 for kind of real-time data or a good forecast   |

|    | Page 358                                       |
|----|--|
| 1  | model, I think to help with that issue. So     |
| 2  | that was the notes I've made to myself to look |
| 3  | at those two possible solutions for that.      |
| 4  | Obviously, the recent survey we do             |
| 5  | will help with the predictions. But if those   |
| 6  | winds are blowing all the time, there'll be a  |
| 7  | cap for the predictions. But if they're more   |
| 8  | out the side, then they won't. But a model     |
| 9  | that takes into account when those winds kick  |
| 10 | up.  |
| 11 | MR. RIMMEL: We don't have as much              |
| 12 | a problem with the winds as we do the current. |
| 13 | MR. EDWING: Right. As I was                    |
| 14 | saying, the winds are probably help drive that |
| 15 | current.                                       |
| 16 | MR. RIMMEL: You'd think so. But                |
| 17 | we get an opposite current on the coastline of |
| 18 | opposite what you think you'd get with the     |
| 19 | normal trade winds, which is pretty unusual.   |
| 20 | MR. EDWING: And again, this is                 |
| 21 | recent current survey. But if we have          |
| 22 | information to be able to understand what's    |
|    |  |

|    | Page 359                                      |
|----|---|
| 1  | going on, we may able to do some              |
| 2  | MR. RIMMEL: Yes.                              |
| 3  | MR. EDWING: forecasting which                 |
| 4  | I think will help you.                        |
| 5  | MR. RIMMEL: Very much appreciate              |
| 6  | it.   |
| 7  | MR. EDWING: And if there's HFR                |
| 8  | assets on the island, which I'm not sure for  |
| 9  | real-time information.                        |
| 10 | LIEUTENANT MILLER: There's also               |
| 11 | considerable capability at the university. I  |
| 12 | don't know if any of the folks that were      |
| 13 | talking about currents, you know there's the  |
| 14 | sea level Dr. Marra, do you                   |
| 15 | DR. MARRA: Well, I don't know the             |
| 16 | exact details. I used basically the ocean     |
| 17 | observing system.                             |
| 18 | LIEUTENANT MILLER: Yes, so I                  |
| 19 | think there is considerable work that's done  |
| 20 | at the university on these current models and |
| 21 | so forth. It might be worth connecting with   |
| 22 | those groups to see, you know, who is doing   |

| Page 3601what in terms of local current modeling right2around the island.3CAPT. BAKER: Yes, UH does have a4website and they've got a lot of their data up5and it's almost real-time. I think they have6data like every 20 minutes or something.7They've got buoys off of Honolulu Harbor and8we have been utilizing those. We have to9convert them because they're not in knots,10it's in I don't know, meters per second or11something. We've been trying to see if that12correlates with what we're observing. And13sometimes it does, sometimes it doesn't. But14I think it has a lot to do with their15observation locations and water depths. You16know, they're not out there for us. They're17obviously trying to fulfill whatever project18they're on. But at least it is up there and19we do utilize it.20Another thing that I meant to21mention earlier was that NWS does have22observation sites in the harbors which also          |    |  |
|--|----|--|
| 2around the island.3CAPT. BAKER: Yes, UH does have a4website and they've got a lot of their data up5and it's almost real-time. I think they have6data like every 20 minutes or something.7They've got buoys off of Honolulu Harbor and8we have been utilizing those. We have to9convert them because they're not in knots,10it's in I don't know, meters per second or11something. We've been trying to see if that12correlates with what we're observing. And13sometimes it does, sometimes it doesn't. But14I think it has a lot to do with their15observation locations and water depths. You16know, they're not out there for us. They're17obviously trying to fulfill whatever project18they're on. But at least it is up there and19we do utilize it.20Another thing that I meant to21mention earlier was that NWS does have   |    | Page 360                                       |
| 3CAPT. BAKER: Yes, UH does have a4website and they've got a lot of their data up5and it's almost real-time. I think they have6data like every 20 minutes or something.7They've got buoys off of Honolulu Harbor and8we have been utilizing those. We have to9convert them because they're not in knots,10it's in I don't know, meters per second or11something. We've been trying to see if that12correlates with what we're observing. And13sometimes it does, sometimes it doesn't. But14I think it has a lot to do with their15observation locations and water depths. You16know, they're not out there for us. They're17obviously trying to fulfill whatever project18they're on. But at least it is up there and19we do utilize it.20Another thing that I meant to21mention earlier was that NWS does have  | 1  | what in terms of local current modeling right  |
| <ul> <li>website and they've got a lot of their data up</li> <li>and it's almost real-time. I think they have</li> <li>data like every 20 minutes or something.</li> <li>They've got buoys off of Honolulu Harbor and</li> <li>we have been utilizing those. We have to</li> <li>convert them because they're not in knots,</li> <li>it's in I don't know, meters per second or</li> <li>something. We've been trying to see if that</li> <li>correlates with what we're observing. And</li> <li>sometimes it does, sometimes it doesn't. But</li> <li>I think it has a lot to do with their</li> <li>observation locations and water depths. You</li> <li>know, they're not out there for us. They're</li> <li>obviously trying to fulfill whatever project</li> <li>they're on. But at least it is up there and</li> <li>we do utilize it.</li> <li>Another thing that I meant to</li> <li>mention earlier was that NWS does have</li> </ul> | 2  | around the island.                             |
| 5and it's almost real-time. I think they have6data like every 20 minutes or something.7They've got buoys off of Honolulu Harbor and8we have been utilizing those. We have to9convert them because they're not in knots,10it's in I don't know, meters per second or11something. We've been trying to see if that12correlates with what we're observing. And13sometimes it does, sometimes it doesn't. But14I think it has a lot to do with their15observation locations and water depths. You16know, they're not out there for us. They're17obviously trying to fulfill whatever project18they're on. But at least it is up there and19we do utilize it.20Another thing that I meant to21mention earlier was that NWS does have  | 3  | CAPT. BAKER: Yes, UH does have a               |
| 6data like every 20 minutes or something.7They've got buoys off of Honolulu Harbor and8we have been utilizing those. We have to9convert them because they're not in knots,10it's in I don't know, meters per second or11something. We've been trying to see if that12correlates with what we're observing. And13sometimes it does, sometimes it doesn't. But14I think it has a lot to do with their15observation locations and water depths. You16know, they're not out there for us. They're17obviously trying to fulfill whatever project18they're on. But at least it is up there and19we do utilize it.20Another thing that I meant to21mention earlier was that NWS does have   | 4  | website and they've got a lot of their data up |
| <ul> <li>They've got buoys off of Honolulu Harbor and</li> <li>we have been utilizing those. We have to</li> <li>convert them because they're not in knots,</li> <li>it's in I don't know, meters per second or</li> <li>something. We've been trying to see if that</li> <li>correlates with what we're observing. And</li> <li>sometimes it does, sometimes it doesn't. But</li> <li>I think it has a lot to do with their</li> <li>observation locations and water depths. You</li> <li>know, they're not out there for us. They're</li> <li>obviously trying to fulfill whatever project</li> <li>they're on. But at least it is up there and</li> <li>we do utilize it.</li> <li>Another thing that I meant to</li> <li>mention earlier was that NWS does have</li> </ul>   | 5  | and it's almost real-time. I think they have   |
| 8 we have been utilizing those. We have to<br>9 convert them because they're not in knots,<br>10 it's in I don't know, meters per second or<br>11 something. We've been trying to see if that<br>12 correlates with what we're observing. And<br>13 sometimes it does, sometimes it doesn't. But<br>14 I think it has a lot to do with their<br>15 observation locations and water depths. You<br>16 know, they're not out there for us. They're<br>17 obviously trying to fulfill whatever project<br>18 they're on. But at least it is up there and<br>19 we do utilize it.<br>20 Another thing that I meant to<br>21 mention earlier was that NWS does have   | 6  | data like every 20 minutes or something.       |
| <ul> <li>9 convert them because they're not in knots,</li> <li>10 it's in I don't know, meters per second or</li> <li>11 something. We've been trying to see if that</li> <li>12 correlates with what we're observing. And</li> <li>13 sometimes it does, sometimes it doesn't. But</li> <li>14 I think it has a lot to do with their</li> <li>15 observation locations and water depths. You</li> <li>16 know, they're not out there for us. They're</li> <li>17 obviously trying to fulfill whatever project</li> <li>18 they're on. But at least it is up there and</li> <li>19 we do utilize it.</li> <li>20 Another thing that I meant to</li> <li>21 mention earlier was that NWS does have</li> </ul>   | 7  | They've got buoys off of Honolulu Harbor and   |
| 10 it's in I don't know, meters per second or<br>11 something. We've been trying to see if that<br>12 correlates with what we're observing. And<br>13 sometimes it does, sometimes it doesn't. But<br>14 I think it has a lot to do with their<br>15 observation locations and water depths. You<br>16 know, they're not out there for us. They're<br>17 obviously trying to fulfill whatever project<br>18 they're on. But at least it is up there and<br>19 we do utilize it.<br>20 Another thing that I meant to<br>21 mention earlier was that NWS does have   | 8  | we have been utilizing those. We have to       |
| 11 something. We've been trying to see if that<br>12 correlates with what we're observing. And<br>13 sometimes it does, sometimes it doesn't. But<br>14 I think it has a lot to do with their<br>15 observation locations and water depths. You<br>16 know, they're not out there for us. They're<br>17 obviously trying to fulfill whatever project<br>18 they're on. But at least it is up there and<br>19 we do utilize it.<br>20 Another thing that I meant to<br>21 mention earlier was that NWS does have  | 9  | convert them because they're not in knots,     |
| 12correlates with what we're observing. And13sometimes it does, sometimes it doesn't. But14I think it has a lot to do with their15observation locations and water depths. You16know, they're not out there for us. They're17obviously trying to fulfill whatever project18they're on. But at least it is up there and19we do utilize it.20Another thing that I meant to21mention earlier was that NWS does have  | 10 | it's in I don't know, meters per second or     |
| <ul> <li>sometimes it does, sometimes it doesn't. But</li> <li>I think it has a lot to do with their</li> <li>observation locations and water depths. You</li> <li>know, they're not out there for us. They're</li> <li>obviously trying to fulfill whatever project</li> <li>they're on. But at least it is up there and</li> <li>we do utilize it.</li> <li>Another thing that I meant to</li> <li>mention earlier was that NWS does have</li> </ul>   | 11 | something. We've been trying to see if that    |
| 14 I think it has a lot to do with their<br>15 observation locations and water depths. You<br>16 know, they're not out there for us. They're<br>17 obviously trying to fulfill whatever project<br>18 they're on. But at least it is up there and<br>19 we do utilize it.<br>20 Another thing that I meant to<br>21 mention earlier was that NWS does have   | 12 | correlates with what we're observing. And      |
| <ul> <li>observation locations and water depths. You</li> <li>know, they're not out there for us. They're</li> <li>obviously trying to fulfill whatever project</li> <li>they're on. But at least it is up there and</li> <li>we do utilize it.</li> <li>Another thing that I meant to</li> <li>mention earlier was that NWS does have</li> </ul>  | 13 | sometimes it does, sometimes it doesn't. But   |
| 16 know, they're not out there for us. They're<br>17 obviously trying to fulfill whatever project<br>18 they're on. But at least it is up there and<br>19 we do utilize it.<br>20 Another thing that I meant to<br>21 mention earlier was that NWS does have   | 14 | I think it has a lot to do with their          |
| <pre>17 obviously trying to fulfill whatever project 18 they're on. But at least it is up there and 19 we do utilize it. 20 Another thing that I meant to 21 mention earlier was that NWS does have</pre>  | 15 | observation locations and water depths. You    |
| 18 they're on. But at least it is up there and<br>19 we do utilize it.<br>20 Another thing that I meant to<br>21 mention earlier was that NWS does have  | 16 | know, they're not out there for us. They're    |
| <pre>19 we do utilize it. 20 Another thing that I meant to 21 mention earlier was that NWS does have</pre>   | 17 | obviously trying to fulfill whatever project   |
| 20 Another thing that I meant to<br>21 mention earlier was that NWS does have  | 18 | they're on. But at least it is up there and    |
| 21 mention earlier was that NWS does have  | 19 | we do utilize it.                              |
|  | 20 | Another thing that I meant to                  |
| 22 observation sites in the harbors which also   | 21 | mention earlier was that NWS does have         |
|  | 22 | observation sites in the harbors which also    |
|    | Page 361                                       |
|----|--|
| 1  | are tied to real-time on the internet that we  |
| 2  | can look at. I look at. I just can use my      |
| 3  | phone to look at them before I go into a port. |
| 4  | Nawiliwili being one that we look at all the   |
| 5  | time because if I'm riding a ship and I'm on   |
| 6  | my way inboard, I could be a few miles off,    |
| 7  | tie in, take a look at what the current        |
| 8  | observation is and what its been as far back   |
| 9  | as I want to look. And that's been very        |
| 10 | helpful to us to be able to look at wind       |
| 11 | direction and wind speeds and the trend. So    |
| 12 | we do appreciate that. That helps. That        |
| 13 | helps tremendously.                            |
| 14 | CAPT. LAMB: I think what the                   |
| 15 | University does, I've been to a couple of      |
| 16 | their meetings. And it was more close in to    |
| 17 | the islands, and Brad definitely would be      |
| 18 | interested in that. But Matson, we'd still     |
| 19 | voice the opinion we'd like something further  |
| 20 | out.   |
| 21 | CHAIR WELCH: Yes, Michele?                     |
| 22 | MEMBER DIONNE: I guess I'm not                 |
|    |  |

| 1  |  |
|----|--|
|    | Page 362                                       |
| 1  | informed about what sort of IOOS observing     |
| 2  | association there is here in Hawaii. But I     |
| 3  | know the association in the northeast is very  |
| 4  | interested in placing buoys in the locations   |
| 5  | where they would be helpful to various         |
| 6  | interest groups. So if there is some way we    |
| 7  | brought that group in and cooperate a little   |
| 8  | bit with this group to determine useful        |
| 9  | locations for buoys to address some of these   |
| 10 | issues.  |
| 11 | I think one of the things that we              |
| 12 | talked about at orientation in Silver Spring   |
| 13 | is that there might be some sort of dialogue   |
| 14 | or conversation started up between HSRP and    |
| 15 | the back up work for IOOS.                     |
| 16 | CHAIR WELCH: IOOS, for people                  |
| 17 | that aren't familiar with the term is it's     |
| 18 | a national term for Integrated Ocean Observing |
| 19 | Systems. And there's a special official in     |
| 20 | NOAA Headquarters that the mission is IOOS.    |
| 21 | And this Panel in the past has pressed IOOS a  |
| 22 | little bit about trying to be a little bit     |

|    | Page 363                                       |
|----|--|
| 1  | more open to the and IOOS has different        |
| 2  | regional components. So there's a New England  |
| 3  | IOOS and I guess there's maybe a Western       |
| 4  | Pacific IOOS.                                  |
| 5  | MEMBER DIONNE: There are quite a               |
| 6  | few.   |
| 7  | CHAIR WELCH: Well, anyway, I'm                 |
| 8  | probably going to get in trouble for saying    |
| 9  | this, but my impression is that IOOS has been  |
| 10 | sort of founded by scientists primarily for    |
| 11 | the benefit of scientists and that ocean users |
| 12 | have to sort of push their way in. And if you  |
| 13 | push enough, they start saying "Oh, yes, we    |
| 14 | could sort of modify our systems or adjust     |
| 15 | what we do to do what we want we want to do    |
| 16 | and do what you want to do too.                |
| 17 | But I think some of the IOOS folks             |
| 18 | are not oriented to think that way initially   |
| 19 | until somebody knocks on the door. So, I       |
| 20 | don't know if that's true down here or not.    |
| 21 | Yes, Jessica?                                  |
| 22 | MS. PODOSKI: Hi, I'm Jessica                   |
|    |  |

Page 364 1 Podoski, Corps of Engineers. 2 I'm not a super active member in our PacIOOS here, and John is probably a 3 little bit more active. But just to bring a 4 5 little bit of that to light, we do have the 6 PacIOOS here and then our subgroup is the 7 IOOS. 8 And it is a group of major 9 scientists, university. But they've done a 10 lot of work with trying to assess coastal hazards and make that information available to 11 12 the public. They're also, I believe, working 13 14 on getting two new buoys out that are going to coming this fall. 15 16 So I would suggest that they have 17 a really good website that they're working. 18 It's just PacIOOS.org or IOOS.org, I believe. 19 So that's definitely work taking a look at 20 that. They tried to make all of that data 21 readily available and do have meetings where 22 they take public comment and things like that

| Page 365<br>1 into account. But I would suggest checking it<br>2 out. We have a pretty strong IOOS in the<br>3 Pacific.<br>4 CHAIR WELCH: Thank you.<br>5 Other comments? Yes, David?<br>6 MEMBER JAY: I'm sort of an<br>7 outsider looking in<br>8 CHAIR WELCH: You might want to<br>9 pull that a little closer.<br>10 MEMBER JAY: Oh, sorry. A couple<br>11 of issues, I mean there's a funding problem,<br>12 which is very uncertain for them, and then<br>13 there's just the random regional variability,<br>14 all sort of different ways that a lot of them<br>15 are going through a transition. It was<br>16 founded by a core group and now they've got to<br>17 make a decision as to how scientific and how<br>18 operational.<br>19 And then the transition would be,<br>20 this is our program, it's our money in it, and<br>21 hope that this is a competitive program that<br>22 is open. So they've got a lot of questions to   |    |  |
|--|----|--|
| 2       out. We have a pretty strong IOOS in the         3       Pacific.         4       CHAIR WELCH: Thank you.         5       Other comments? Yes, David?         6       MEMBER JAY: I'm sort of an         7       outsider looking in         8       CHAIR WELCH: You might want to         9       pull that a little closer.         10       MEMBER JAY: Oh, sorry. A couple         11       of issues, I mean there's a funding problem,         12       which is very uncertain for them, and then         13       there's just the random regional variability,         14       all sort of different ways that a lot of them         15       are going through a transition. It was         16       founded by a core group and now they've got to         17       make a decision as to how scientific and how         18       operational.         19       And then the transition would be,         20       this is our program, it's our money in it, and         21       hope that this is a competitive program that |    | Page 365                                       |
| <ul> <li>Pacific.</li> <li>CHAIR WELCH: Thank you.</li> <li>Other comments? Yes, David?</li> <li>MEMBER JAY: I'm sort of an</li> <li>outsider looking in</li> <li>CHAIR WELCH: You might want to</li> <li>pull that a little closer.</li> <li>MEMBER JAY: Oh, sorry. A couple</li> <li>of issues, I mean there's a funding problem,</li> <li>which is very uncertain for them, and then</li> <li>there's just the random regional variability,</li> <li>all sort of different ways that a lot of them</li> <li>are going through a transition. It was</li> <li>founded by a core group and now they've got to</li> <li>make a decision as to how scientific and how</li> <li>operational.</li> <li>And then the transition would be,</li> <li>this is our program, it's our money in it, and</li> <li>hope that this is a competitive program that</li> </ul>  | 1  | into account. But I would suggest checking it  |
| <ul> <li>CHAIR WELCH: Thank you.</li> <li>Other comments? Yes, David?</li> <li>MEMBER JAY: I'm sort of an</li> <li>outsider looking in</li> <li>CHAIR WELCH: You might want to</li> <li>pull that a little closer.</li> <li>MEMBER JAY: Oh, sorry. A couple</li> <li>of issues, I mean there's a funding problem,</li> <li>which is very uncertain for them, and then</li> <li>there's just the random regional variability,</li> <li>all sort of different ways that a lot of them</li> <li>are going through a transition. It was</li> <li>founded by a core group and now they've got to</li> <li>make a decision as to how scientific and how</li> <li>operational.</li> <li>And then the transition would be,</li> <li>this is our program, it's our money in it, and</li> <li>hope that this is a competitive program that</li> </ul>  | 2  | out. We have a pretty strong IOOS in the       |
| 5       Other comments? Yes, David?         6       MEMBER JAY: I'm sort of an         7       outsider looking in         8       CHAIR WELCH: You might want to         9       pull that a little closer.         10       MEMBER JAY: Oh, sorry. A couple         11       of issues, I mean there's a funding problem,         12       which is very uncertain for them, and then         13       there's just the random regional variability,         14       all sort of different ways that a lot of them         15       are going through a transition. It was         16       founded by a core group and now they've got to         17       make a decision as to how scientific and how         18       operational.         19       And then the transition would be,         20       this is our program, it's our money in it, and         21       hope that this is a competitive program that   | 3  | Pacific.                                       |
| <ul> <li>MEMBER JAY: I'm sort of an</li> <li>outsider looking in</li> <li>CHAIR WELCH: You might want to</li> <li>pull that a little closer.</li> <li>MEMBER JAY: Oh, sorry. A couple</li> <li>of issues, I mean there's a funding problem,</li> <li>which is very uncertain for them, and then</li> <li>there's just the random regional variability,</li> <li>all sort of different ways that a lot of them</li> <li>are going through a transition. It was</li> <li>founded by a core group and now they've got to</li> <li>make a decision as to how scientific and how</li> <li>operational.</li> <li>And then the transition would be,</li> <li>this is our program, it's our money in it, and</li> <li>hope that this is a competitive program that</li> </ul>  | 4  | CHAIR WELCH: Thank you.                        |
| 7outsider looking in8CHAIR WELCH: You might want to9pull that a little closer.10MEMBER JAY: Oh, sorry. A couple11of issues, I mean there's a funding problem,12which is very uncertain for them, and then13there's just the random regional variability,14all sort of different ways that a lot of them15are going through a transition. It was16founded by a core group and now they've got to17make a decision as to how scientific and how18operational.19And then the transition would be,20this is our program, it's our money in it, and21hope that this is a competitive program that   | 5  | Other comments? Yes, David?                    |
| <ul> <li>8 CHAIR WELCH: You might want to</li> <li>9 pull that a little closer.</li> <li>10 MEMBER JAY: Oh, sorry. A couple</li> <li>11 of issues, I mean there's a funding problem,</li> <li>12 which is very uncertain for them, and then</li> <li>13 there's just the random regional variability,</li> <li>14 all sort of different ways that a lot of them</li> <li>15 are going through a transition. It was</li> <li>16 founded by a core group and now they've got to</li> <li>17 make a decision as to how scientific and how</li> <li>18 operational.</li> <li>19 And then the transition would be,</li> <li>20 this is our program, it's our money in it, and</li> <li>21 hope that this is a competitive program that</li> </ul>   | 6  | MEMBER JAY: I'm sort of an                     |
| <ul> <li>9 pull that a little closer.</li> <li>10 MEMBER JAY: Oh, sorry. A couple</li> <li>11 of issues, I mean there's a funding problem,</li> <li>12 which is very uncertain for them, and then</li> <li>13 there's just the random regional variability,</li> <li>14 all sort of different ways that a lot of them</li> <li>15 are going through a transition. It was</li> <li>16 founded by a core group and now they've got to</li> <li>17 make a decision as to how scientific and how</li> <li>18 operational.</li> <li>19 And then the transition would be,</li> <li>20 this is our program, it's our money in it, and</li> <li>21 hope that this is a competitive program that</li> </ul>   | 7  | outsider looking in                            |
| 10 MEMBER JAY: Oh, sorry. A couple<br>11 of issues, I mean there's a funding problem,<br>12 which is very uncertain for them, and then<br>13 there's just the random regional variability,<br>14 all sort of different ways that a lot of them<br>15 are going through a transition. It was<br>16 founded by a core group and now they've got to<br>17 make a decision as to how scientific and how<br>18 operational.<br>19 And then the transition would be,<br>20 this is our program, it's our money in it, and<br>21 hope that this is a competitive program that   | 8  | CHAIR WELCH: You might want to                 |
| 11of issues, I mean there's a funding problem,12which is very uncertain for them, and then13there's just the random regional variability,14all sort of different ways that a lot of them15are going through a transition. It was16founded by a core group and now they've got to17make a decision as to how scientific and how18operational.19And then the transition would be,20this is our program, it's our money in it, and21hope that this is a competitive program that  | 9  | pull that a little closer.                     |
| 12 which is very uncertain for them, and then<br>13 there's just the random regional variability,<br>14 all sort of different ways that a lot of them<br>15 are going through a transition. It was<br>16 founded by a core group and now they've got to<br>17 make a decision as to how scientific and how<br>18 operational.<br>19 And then the transition would be,<br>20 this is our program, it's our money in it, and<br>21 hope that this is a competitive program that  | 10 | MEMBER JAY: Oh, sorry. A couple                |
| 13 there's just the random regional variability,<br>14 all sort of different ways that a lot of them<br>15 are going through a transition. It was<br>16 founded by a core group and now they've got to<br>17 make a decision as to how scientific and how<br>18 operational.<br>19 And then the transition would be,<br>20 this is our program, it's our money in it, and<br>21 hope that this is a competitive program that   | 11 | of issues, I mean there's a funding problem,   |
| 14 all sort of different ways that a lot of them<br>15 are going through a transition. It was<br>16 founded by a core group and now they've got to<br>17 make a decision as to how scientific and how<br>18 operational.<br>19 And then the transition would be,<br>20 this is our program, it's our money in it, and<br>21 hope that this is a competitive program that   | 12 | which is very uncertain for them, and then     |
| 15 are going through a transition. It was<br>16 founded by a core group and now they've got to<br>17 make a decision as to how scientific and how<br>18 operational.<br>19 And then the transition would be,<br>20 this is our program, it's our money in it, and<br>21 hope that this is a competitive program that   | 13 | there's just the random regional variability,  |
| 16 founded by a core group and now they've got to<br>17 make a decision as to how scientific and how<br>18 operational.<br>19 And then the transition would be,<br>20 this is our program, it's our money in it, and<br>21 hope that this is a competitive program that  | 14 | all sort of different ways that a lot of them  |
| 17 make a decision as to how scientific and how<br>18 operational.<br>19 And then the transition would be,<br>20 this is our program, it's our money in it, and<br>21 hope that this is a competitive program that   | 15 | are going through a transition. It was         |
| <pre>18 operational.<br/>19 And then the transition would be,<br/>20 this is our program, it's our money in it, and<br/>21 hope that this is a competitive program that</pre>  | 16 | founded by a core group and now they've got to |
| And then the transition would be,<br>this is our program, it's our money in it, and<br>hope that this is a competitive program that  | 17 | make a decision as to how scientific and how   |
| 20 this is our program, it's our money in it, and<br>21 hope that this is a competitive program that   | 18 | operational.                                   |
| 21 hope that this is a competitive program that  | 19 | And then the transition would be,              |
|  | 20 | this is our program, it's our money in it, and |
| 22 is open. So they've got a lot of questions to   | 21 | hope that this is a competitive program that   |
|  | 22 | is open. So they've got a lot of questions to  |

|    | Page 366                                       |
|----|--|
| 1  | answer, a lot of disarray, at least from what  |
| 2  | I understand.                                  |
| 3  | CHAIR WELCH: Okay.                             |
| 4  | MEMBER BRIGHAM: Well, I'll just                |
| 5  | put in a plug for AOOS. We have one in         |
| 6  | Alaska, it's very robust. It's all driven by   |
| 7  | stakeholder interests because we don't have a  |
| 8  | lot of observations and it's kind of we're     |
| 9  | starting up, ground zero.                      |
| 10 | We've gone out robustly over a                 |
| 11 | couple of years to get the stakeholders to     |
| 12 | tell us what they need. And one, of course,    |
| 13 | one issue is sea ice, which is a little        |
| 14 | different than the Great Lakes. But I think    |
| 15 | ours is actually stakeholder driven.           |
| 16 | We've had scientists run a few                 |
| 17 | projects, currents off Valdez and Prince       |
| 18 | William Sound. So there have been some         |
| 19 | scientific components to work the modeling     |
| 20 | issues. But the rest of it is open and above   |
| 21 | and we've kind of went around the state and    |
| 22 | talk to all the stakeholders and other actors. |

|    | Page 367                                       |
|----|--|
| 1  | CHAIR WELCH: Okay. Thank you.                  |
| 2  | All right. Well, if we don't have              |
| 3  | any other comments, let me thank all of our    |
| 4  | panelists for a good discussion. We            |
| 5  | appreciate your observations and we would like |
| 6  | to stay in touch. If you have any further      |
| 7  | thoughts after this meeting, please feel free  |
| 8  | to share them with us.                         |
| 9  | And this has been some definite                |
| 10 | contribution to our work. So, thanks to        |
| 11 | everyone.                                      |
| 12 | (Applause).                                    |
| 13 | CHAIR WELCH: Okay. We have                     |
| 14 | periodically through the day had various, the  |
| 15 | NOAA people were at the table or beyond the    |
| 16 | table speak or be identified. But I don't      |
| 17 | think we have comprehensively introducing      |
| 18 | everybody from NOAA. So if we can, why don't   |
| 19 | we get all the NOAA folks in the room to stand |
| 20 | up and then just go around and identify        |
| 21 | yourself and your responsibility, please.      |
| 22 | So, everybody stand up together.               |

|    | Page 368                                       |
|----|--|
| 1  | Okay.  |
| 2  | MS. HAMILTON: I'm Laura Hamilton               |
| 3  | and I'm stationed here on Honolulu. And I am   |
| 4  | NOAA's Regional Coordinator for all of NOAA in |
| 5  | the Pacific Islands.                           |
| 6  | CHAIR WELCH: Thanks, Laura.                    |
| 7  | MR. CARLSON: I'm Edward Carlson.               |
| 8  | I'm with National Geodetic Survey. I'm the     |
| 9  | Pacific Region Geodetic Advisor.               |
| 10 | CHAIR WELCH: Great. Thank you.                 |
| 11 | Everybody else.                                |
| 12 | MEMBER MILLER: John just walked                |
| 13 | out.   |
| 14 | CHAIR WELCH: He values his                     |
| 15 | anonymity.                                     |
| 16 | Okay. We are at the point of the               |
| 17 | program where this is the open mic part of the |
| 18 | program. We don't want any people to sing or   |
| 19 | tell jokes, but this is the opportunity for    |
| 20 | anybody, a member of the public or other       |
| 21 | federal agencies that wasn't on the agenda to  |
| 22 | have a chance to be recognized. So, do we      |

Page 369 1 have anybody that would like to take advantage 2 of that? 3 MS. WATSON: Ed, we have someone. 4 CHAIR WELCH: Yes. Stand up, 5 introduce yourself. Welcome. 6 MR. SWATLAND: I'm actually 7 another NOAA person. 8 Good afternoon. My name is David 9 Swatland. I'm the Deputy Superintendent for Programs and Policy at Papahanaumokuakea 10 Marine National Monument. 11 12 Thanks for the opportunity to 13 speak today. 14 I'm here to represent the monument and say that the atolls, coral reefs and deep 15 water habitat of the northwestern Hawaii 16 17 Islands are home to an incredible wealth of natural and cultural resources. One of the 18 19 last places on the planet to exist much as it 20 did before human contact. 21 There's also only one of 11 PSSAs, 22 or particularly sensitive sea areas, designed

|    | Page 370                                       |
|----|--|
| 1  | by the IMO and was recently selected by UNESCO |
| 2  | as this nation's only mixed world heritage     |
| 3  | site. As such, the northwestern Hawaiian       |
| 4  | Islands deserved the highest possible level of |
| 5  | protection that we can provide them. We can    |
| 6  | only do this if we know what is out there.     |
| 7  | Without accurate, comprehensive and up to date |
| 8  | mapping data over, on and under the water we   |
| 9  | cannot effectively monitor the impacts of      |
| 10 | global climate change such as sea level rise   |
| 11 | and coral bleaching, nor can we adequately     |
| 12 | determine the impacts of habitat change or     |
| 13 | natural events such as the recent tsunami      |
| 14 | which caused significant alteration of the     |
| 15 | northwest Hawaiian Islands ecosystem.          |
| 16 | We also potentially put that                   |
| 17 | ecosystem and our own personnel in harm's way  |
| 18 | by not providing them precise navigational     |
| 19 | data for operating vessels in the monument.    |
| 20 | We all know that the tools to                  |
| 21 | accomplish this effort exist. It's a question  |
| 22 | of prioritization. On behalf of all seven of   |

|    | Page 371                                       |
|----|--|
| 1  | Papahanaumokuakea Marine National Monument's   |
| 2  | co-managing agencies I respectfully request    |
| 3  | your highest level of support and advocacy in  |
| 4  | helping us protect this sentinel site and one  |
| 5  | of the planet's most incredible treasures.     |
| 6  | Thank you.                                     |
| 7  | CHAIR WELCH: Okay. Thank you.                  |
| 8  | And don't sit down. Let's see if               |
| 9  | we have any questions.                         |
| 10 | Tell us a little bit more about                |
| 11 | the physical attributes of the monument.       |
| 12 | Because some of us are more familiar than      |
| 13 | others.  |
| 14 | MR. SWATLAND: Okay. The monument               |
| 15 | was designated in 2006 by President Clinton.   |
| 16 | It stretches to the west northwest from Nihue, |
| 17 | the last of the main Hawaiian Islands. It's    |
| 18 | 1200 miles long by 100 miles wide. It          |
| 19 | stretches all the way out to Kure Island,      |
| 20 | which is a good bit west and north of here.    |
| 21 | The water is a lot colder, the water is a lot  |
| 22 | rougher, too, a lot of the time.               |

|    | Page 372                                       |
|----|--|
| 1  | It's a 140,000 square miles, only              |
| 2  | five of which is emergent land. The rest is    |
| 3  | atolls, reefs, coral reefs and deep ocean      |
| 4  | habitat.                                       |
| 5  | There is an incredible array of                |
| 6  | wildlife out there. It is a nesting area for   |
| 7  | 14 million seabirds. It is the last stronghold |
| 8  | of the Hawaiian monk seal. All kinds of turtle |
| 9  | nesting areas. And an underwater habitat that  |
| 10 | we are just beginning to truly explore in      |
| 11 | terms of coral reefs and fish and other        |
| 12 | underway life.                                 |
| 13 | It's a truly incredible place. If              |
| 14 | anyone goes out there, it's a life changing    |
| 15 | experience for anybody who goes out there.     |
| 16 | And there are a number of gaps in              |
| 17 | our mapping data, and it would be nice to have |
| 18 | the baselines before we embark on any          |
| 19 | vulnerability assessments or to be able to     |
| 20 | measure the impacts of things like the         |
| 21 | tsunami, which occurred a couple of weeks ago  |
| 22 | which did make some significant changes to     |

| Page 3<br>1 island structures, vegetation, habitat and who<br>2 knows what underwater because we haven't been<br>3 able to get out there and look at it yet.<br>4 CHAIR WELCH: When you indicate<br>5 that there is a need for various types of<br>6 nautical charting and that, are you talking<br>7 about habitat types of charts and maps? Are<br>8 you talking about nautical or shoreline<br>9 mapping, or some combination. And<br>10 MR. SWATLAND: Yes, all of the<br>11 above.<br>12 CHAIR WELCH: But has the staff or | 272 |
|--|-----|
| 2 knows what underwater because we haven't been<br>3 able to get out there and look at it yet.<br>4 CHAIR WELCH: When you indicate<br>5 that there is a need for various types of<br>6 nautical charting and that, are you talking<br>7 about habitat types of charts and maps? Are<br>8 you talking about nautical or shoreline<br>9 mapping, or some combination. And<br>10 MR. SWATLAND: Yes, all of the<br>11 above.   | 15  |
| 3 able to get out there and look at it yet. 4 CHAIR WELCH: When you indicate 5 that there is a need for various types of 6 nautical charting and that, are you talking 7 about habitat types of charts and maps? Are 8 you talking about nautical or shoreline 9 mapping, or some combination. And 10 MR. SWATLAND: Yes, all of the 11 above.  |     |
| 4 CHAIR WELCH: When you indicate<br>5 that there is a need for various types of<br>6 nautical charting and that, are you talking<br>7 about habitat types of charts and maps? Are<br>8 you talking about nautical or shoreline<br>9 mapping, or some combination. And<br>10 MR. SWATLAND: Yes, all of the<br>11 above.   |     |
| 5 that there is a need for various types of<br>6 nautical charting and that, are you talking<br>7 about habitat types of charts and maps? Are<br>8 you talking about nautical or shoreline<br>9 mapping, or some combination. And<br>10 MR. SWATLAND: Yes, all of the<br>11 above.   |     |
| <ul> <li>6 nautical charting and that, are you talking</li> <li>7 about habitat types of charts and maps? Are</li> <li>8 you talking about nautical or shoreline</li> <li>9 mapping, or some combination. And</li> <li>10 MR. SWATLAND: Yes, all of the</li> <li>11 above.</li> </ul>  |     |
| <pre>7 about habitat types of charts and maps? Are 8 you talking about nautical or shoreline 9 mapping, or some combination. And 10 MR. SWATLAND: Yes, all of the 11 above.</pre>  |     |
| 8 you talking about nautical or shoreline<br>9 mapping, or some combination. And<br>10 MR. SWATLAND: Yes, all of the<br>11 above.  |     |
| 9 mapping, or some combination. And<br>10 MR. SWATLAND: Yes, all of the<br>11 above.   |     |
| 10 MR. SWATLAND: Yes, all of the<br>11 above.  |     |
| 11 above.  |     |
|  |     |
| 1) CUATD WELCUP Dut had the staff or   |     |
| 12 CHAIR WELCH: But has the staff or   |     |
| 13 can the staff develop some kind of a summary  |     |
| 14 of priority needs?  |     |
| 15 MR. SWATLAND: We can do that. We  |     |
| 16 have been going at this kind of piecemeal the   |     |
| 17 last couple of years. As a matter of fact,  |     |
| 18 I'm in the middle of writing up a statement of  |     |
| 19 work to contract out for some bathymetric   |     |
| 20 LIDAR work in fiscal year '12. But we would   |     |
| 21 be happy to provide the Panel with a  |     |
| 22 prioritized list of what we're looking for.   |     |

Page 374 1 CHAIR WELCH: Well, I think given 2 the vastness of the area and the different 3 types of work that ideally would be done if 4 the resources were there, some degree of prioritization would be helpful to the Agency 5 6 and people that have to do budgets and things. 7 Just a request. 8 And we need work. People are 9 going to say "Oh, my gosh that's a pretty 10 major task" and you're in competition with other folks. The more specific you can be 11 12 about what you consider to be really critical 13 I think helps you make your case. 14 MR. SWATLAND: We would be happy to formalize that in a memo and forward it on 15 16 up. 17 CHAIR WELCH: Okay. 18 MEMBER MILLER: I've worked with 19 the monument in mapping up in the northwest 20 for the past decade. 21 MR. SWATLAND: Okay. Great. 22 MEMBER MILLER: And so I'll make

|    | Page 375                                       |
|----|--|
| 1  | you aware, a report for the coral program has  |
| 2  | just been completed that pretty much details   |
| 3  | how much has been mapped and so forth.         |
| 4  | But what is Sanctuary's budget, or             |
| 5  | the monument's budget for doing mapping?       |
| б  | Because, you know there have been estimates;   |
| 7  | oh, it's going to \$8 million to do LIDAR up   |
| 8  | there. I mean it's a huge area. And it         |
| 9  | doesn't make sense to do piecemeal, that's for |
| 10 | sure.  |
| 11 | So what is the budget that                     |
| 12 | MR. SWATLAND: For fiscal year?                 |
| 13 | Actually, for this year and for next year it's |
| 14 | \$100,000 each year and that's for both        |
| 15 | collection and processing. So we've been       |
| 16 | trying to aim at our highest priority areas    |
| 17 | and go piecemeal. Because either we go         |
| 18 | piecemeal or we go nothing at all.             |
| 19 | MEMBER MILLER: I mean, that's                  |
| 20 | always been one of the problems is for a LIDAR |
| 21 | contract, \$100,000 doesn't get the plane      |
| 22 | there. I mean, it just it doesn't.             |

|    | Page 376                                       |
|----|--|
| 1  | MR. SWATLAND: We've been working               |
| 2  | with USGS and also Fish and Wildlife in the    |
| 3  | past to assist with this stuff, too.           |
| 4  | CHAIR WELCH: Juliana?                          |
| 5  | MS. BLACKWELL: I was going to                  |
| 6  | comment about something similar, which is      |
| 7  | looking at the other NOAA assets and what's    |
| 8  | been done, not only from the data collection   |
| 9  | currently but if there were specific           |
| 10 | requirements that you had for your mapping and |
| 11 | you were looking at contracting that out, just |
| 12 | to look at the existing NOAA contractors that  |
| 13 | we already have onboard in a lot of either     |
| 14 | NGS' contracts or Coast Survey, et cetera, and |
| 15 | make use of the existing contractors that we   |
| 16 | already have ready to go.                      |
| 17 | MR. SWATLAND: And, actually, this              |
| 18 | year as opposed to last, I have hooked up with |
| 19 | Jamie Carter at Pacific Science Center and     |
| 20 | he's got me hooked up with the folks on the    |
| 21 | East Coast in South Carolina. So we are going  |
| 22 | to be able to access that EDIQ contract that   |

|    | Page 377                                       |
|----|--|
| 1  | they have out there.                           |
| 2  | So we're going to get more for our             |
| 3  | money this year then we got last, but it's     |
| 4  | still a significant amount.                    |
| 5  | MS. BLACKWELL: Yes. In addition                |
| 6  | I think to the contracting you're talking      |
| 7  | about, we have shoreline and geodetic          |
| 8  | surveying contractors through the A&E          |
| 9  | contracting requirements. So depending upon    |
| 10 | what type of survey that you need and what     |
|    |  |
| 11 | accuracies you're looking for, just realize    |
| 12 | that there are other contracting mechanisms    |
| 13 | that are available through either National     |
| 14 | Geodetic Survey or other parts of NOS or NOAA. |
| 15 | CHAIR WELCH: Yes, sir?                         |
| 16 | MR. CARLSON: Ed Carlson.                       |
| 17 | Explain to them how the monument               |
| 18 | operates. It's not just sanctuaries. What the  |
| 19 | whole relationship of the monument is. That    |
| 20 | might give a little background of what's going |
| 21 | on, too.                                       |
| 22 | MR. SWATLAND: Well, there's seven              |

|    | Page 378                                       |
|----|--|
| 1  | different co-managing agencies. There's two    |
| 2  | from NOAA, two from Fish and Wildlife Service  |
| 3  | and three from the State of Hawaii. And each   |
| 4  | of us have our own budget and our stovepipes   |
| 5  | and our own approval processes for money. So   |
| б  | reaching consensus on where we're going to go  |
| 7  | and what we're going to do is, obviously, a    |
| 8  | little more challenging for us then most of    |
| 9  | the other national marine sanctuaries.         |
| 10 | We do end up getting there on most             |
| 11 | cases, but it is a challenge. So, you know     |
| 12 | each agency has their own priorities. So       |
| 13 | that's another reason we've been going at this |
| 14 | piecemeal because we have certain priorities,  |
| 15 | Fish and Wildlife has certain priorities, NMFS |
| 16 | has certain priorities. And all of us are in   |
| 17 | an extremely resource constrained environment. |
| 18 | CHAIR WELCH: Yes?                              |
| 19 | CAPT. LOWELL: Yes. Just a quick                |
| 20 | comment.                                       |
| 21 | As you know, you know we have been             |
| 22 | trying to actively support the charting of the |
|    |  |

|    | Page 379                                       |
|----|--|
| 1  | area. We have engaged with several different   |
| 2  | groups that have collected data, kind of at ad |
| 3  | hoc. We've done a lot of stuff with the        |
| 4  | University of Hawaii, deeper water survey,     |
| 5  | some of the coral mapping that Joyce had been  |
| 6  | doing if we don't already have access to it.   |
| 7  | We don't have any active                       |
| 8  | hydrographic initiatives going on out here in  |
| 9  | Hawaii right now. As you've heard from some    |
| 10 | of these discussions here today, there's       |
| 11 | certainly other areas that we are focused on   |
| 12 | this point. Obviously 100K really is a         |
| 13 | challenging position to be in when you're      |
| 14 | talking about acquisition of hydrographic      |
| 15 | data. I'm not sure what I can do you on that.  |
| 16 | But I would encourage you that when you do     |
| 17 | acquire data, that you look not only at your   |
| 18 | specific needs but look at trying to meet that |
| 19 | for our user update whenever possible. I know  |
| 20 | that brings the cost up. I know with a 100K    |
| 21 | you're not going to have that. But, you know   |
| 22 | when we do deal with data that's come back     |

| 1  | Page 380                                       |
|----|--|
| 1  |  |
| -  | that's loosey-goosey or fast and furious it    |
| 2  | becomes a challenge for us to update a         |
| 3  | nautical chart with that information.          |
| 4  | LIDR is a powerful tool, but it's not          |
| 5  | going to get to all the coral and we've got to |
| 6  | caveat all the data in that respect.           |
| 7  | So I guess what I'm saying is that             |
| 8  | we want to help you. We're certainly willing   |
| 9  | to share our specs and deliverables. We do     |
| 10 | have in place a contract vehicle with a very   |
| 11 | high ceiling that we could simply put more     |
| 12 | money into. Perhaps we could partner. I'm      |
| 13 | not sure how that's going to work. But we do   |
| 14 | have LIDR contract that was just released and  |
| 15 | it's a two contract, LIDR anyway. And maybe    |
| 16 | we can pool some money together which would    |
| 17 | enable us to issue contracts.                  |
| 18 | I think there's a lot of                       |
| 19 | directions we can go there. I feel for you.    |
| 20 | MR. SWATLAND: Thank you.                       |
| 21 | CHAIR WELCH: Any other comments                |
| 22 | or questions?                                  |

Page 381 1 MR. MORRIS: Yes, I'd like to make 2 a couple of comments. I don't need a mic. Could you please 3 MS. WATSON: 4 speak in the mic so the court reporter. 5 MR. MORRIS: Oh, okay. For the 6 court reporter. 7 My name is Daniel Morris. I'm the 8 Geospatial Officer for the Commander and Chief of the U.S. Pacific Fleet. 9 We make very good use of the NOAA 10 products for coverage in the U.S. waters. 11 We 12 consider them to be accurate. They're current. They provide comprehensive coverage. 13 14 If the rest of my AOR was as well covered with 15 nautical charts like the NOAA charts, I would have much less of a problem then I do have. 16 17 There were comments today 18 regarding the overlap of the Navy with the 19 NOAA survey program. The Navy seven T-AGS 20 multipurpose oceanographic survey vessels, 21 five of which tend to be assigned to the PACOM 22 AOR at the present time.

Page 382 1 Let me guarantee you there is no 2 overlap with NOAA's survey program. Our ships live and die overseas, all right? 3 They almost never come back into U.S. waters. 4 The only 5 exception there would probably be the 6 Commonwealth of the Marianas Islands and an 7 occasional stop in Hawaii. But we rarely make it back to the mainland. 8 9 We leave that to NOAA to do the 10 surveys in the U.S. waters. Occasionally, we might do a training range or a special survey 11 12 for a weapons system project. But rarely do we 13 come back in the United States. So I don't 14 see any overlap at all with the NOAA survey 15 program. 16 We rely on NOAA to do those 17 surveys in the U.S. waters. In fact, I wish NOAA was better funded simply because I 18 19 believe it is in the best interest of the 20 defense of this nation to have NOAA survey all 21 U.S. waters from the coastline to the seaward 22 edge of our extended continental shelf claim,

|    | Page 383                                       |
|----|--|
| 1  | which I know you are resourced to do. But you  |
| 2  | seem to apply your assets into the areas of    |
| 3  | highest priority. The ports that we most       |
| 4  | commonly use, you tend to maintain very, very  |
| 5  | well.  |
| 6  | The places in which we                         |
| 7  | deficiencies, like the Aleutians, are not      |
| 8  | commonly traveled by many of the mariners.     |
| 9  | However, we do occasionally go there.          |
| 10 | The additional NOAA products, the              |
| 11 | oceanographic support products were also used  |
| 12 | by our forces. It would be nice to see         |
| 13 | expansion of those programs.                   |
| 14 | We appreciate the geodetic work                |
| 15 | done by NOAA. For those of us interested in    |
| 16 | targeted accuracy, it's very important. And    |
| 17 | the geodetic networks in the United States and |
| 18 | as they integrate with the work that's done by |
| 19 | the National Geospatial Intelligence Agency    |
| 20 | for all very critical to our defensive effort. |
| 21 | So my appreciation for that.                   |
| 22 | And there were comments today                  |

|    | Page 38  |
|----|--|
| 1  | about the resourcing of NOAA. And we go        |
| 2  | through the same budget drill inside the Navy. |
| 3  | I guarantee you that every single year it's a  |
| 4  | zero-based review. We have to fight to         |
| 5  | maintain our ships, to maintain the funding    |
| 6  | for our programs. And the only guidance I can  |
| 7  | offer to you is detail documentation of every  |
| 8  | single requirement and get your customers to   |
| 9  | come on line to say how badly they need your   |
| 10 | support, your services, your date in order to  |
| 11 | support whatever it is that they do. That's    |
| 12 | what we do to justify the existence of our     |
| 13 | ships. And if you don't do that, I would       |
| 14 | imagine your survey ships would start to       |
| 15 | dwindle away over time.                        |
| 16 | So, I would ask all the customers              |
| 17 | to do their best to get their cards and        |
| 18 | letters in, to document what their             |
| 19 | requirements and to provide a good business    |
| 20 | case for them to justify the expenses of the   |
| 21 | resources. Times are tight for all of us and   |
| 22 | the only way we will defend the NOAA program   |

4

|    | Page 385                                      |
|----|---|
| 1  | is to document the requirements.              |
| 2  | Any questions?                                |
| 3  | CHAIR WELCH: Okay. Thanks very                |
| 4  | presentation. Questions or comments?          |
| 5  | Does the Navy have a systematic               |
| б  | way of communicating to NOAA what your        |
| 7  | requirements are or what your hope is or you  |
| 8  | preference is                                 |
| 9  | MR. MORRIS: The geospatial                    |
| 10 | requirements in the miliary are governed by a |
| 11 | JCS instruction, all right. And under that    |
| 12 | instruction all geospatial requirements       |
| 13 | including those for nautical charts produced  |
| 14 | by NOAA by mandate go to the supported        |
| 15 | geographic combatant commander, in our case   |
| 16 | PACOM up at Camp Smith. And he submits it to  |
| 17 | NGA. And those that fall under the purview of |
| 18 | NOAA, NGA will communicate to NOAA for us.    |
| 19 | So, we don't directly go to NOAA.             |
| 20 | We have a system where we get all of our      |
| 21 | requirements all rolled up. They go into the  |
| 22 | agency and the agency does the coordination   |

|    | Page 386                                       |
|----|--|
| 1  | for us.  |
| 2  | And I would also comment that NOAA             |
| 3  | also coordinates with the Commander Navy       |
| 4  | Metrology and Oceanography Command who owns    |
| 5  | the survey ships, the survey program so that   |
| 6  | there's no duplication effort in that regards. |
| 7  | CHAIR WELCH: All right.                        |
| 8  | CAPT. LOWELL: Thanks, Daniel.                  |
| 9  | We do coordinate very well. But I would say    |
| 10 | whenever they have a request of us, we         |
| 11 | certainly do travel. We typically don't have   |
| 12 | a lot of requests for the Navy, although the   |
| 13 | general rule is if they do collect data in     |
| 14 | U.S. waters because they provide quickly and   |
| 15 | efficiently to us. And a good example is up    |
| 16 | in the Arctic last year, because one of your   |
| 17 | vessels was up there. And they're certainly    |
| 18 | sharing the data they collect. It wasn't a     |
| 19 | lot, but it was in the areas of the Arctic.    |
| 20 | MR. MORRIS: And some of the data               |
| 21 | we've collected in Apra and Saipan Harbor, to  |
| 22 | name a few.                                    |

|    | Page 387                                       |
|----|--|
| 1  | CAPT. LOWELL: Yes. So I would                  |
| 2  | say our relationship is fairly well            |
| 3  | coordinated. Everything could get better.      |
| 4  | MR. MORRIS: Yes?                               |
| 5  | MEMBER MILLER: In terms of Apra,               |
| 6  | the management agencies were desperate for     |
| 7  | that data and I'm sure you can understand why  |
| 8  | probably. And through                          |
| 9  | MR. MORRIS: Well, our carriers                 |
| 10 | want it.                                       |
| 11 | MEMBER MILLER: Yes. Yes. Through               |
| 12 | NOAA, you know they got the data rapidly. And  |
| 13 | that was a really excellent example of         |
| 14 | coordination and access to data, and so forth. |
| 15 | MR. MORRIS: Okay. One other                    |
| 16 | comment. The duplication of the DNC and then   |
| 17 | NOAA's ENC came up today. Let me just state    |
| 18 | that the data is the same. The only thing      |
| 19 | that's really different is the format, and     |
| 20 | that's for compatibility with our command and  |
| 21 | control and weapon navigation system.          |
| 22 | But there is talk of a long range              |

Page 388 1 plan to convert to the ENC format when the 2 international community moves to the S100 and 101 standards, which are still being debated 3 So I can see some point in the 4 at this time. 5 future when we are fully compatible, not only 6 with the data but also with the format used to 7 present the data. 8 CHAIR WELCH: Okay. Yes, Gary? 9 MEMBER JEFFRESS: I know it has 10 very sophisticated side-scan sonar with a totally different mission then to produce 11 12 nautical charts. Do they just scan and then throw their data away if they don't find any -13 14 MR. MORRIS: No. Our site scan 15 16 sonar tends to be for site-specific surveys 17 for military purposes. Clutter mapping for mine warfare, routes and things like that. 18 19 And so it's typically very site-specific and 20 because of the classification of what we're 21 doing, it's generally not released. 22 So we don't do large area mapping

|    | Page 389                                       |
|----|--|
| 1  | with the site scan sonar. So the utility is    |
| 2  | very, very narrow. But we do have a            |
| 3  | capability to do surveys on demand.            |
| 4  | For example, for Operation                     |
| 5  | Tomodachi, the Foreign Humanitarian Assistance |
| 6  | to Japan following the recent tsunami out      |
| 7  | there, one of our salvage ships was in there   |
| 8  | and provided support removing material from    |
| 9  | one of their ports and used their side-scan    |
| 10 | sonar to identify the objects that needed to   |
| 11 | be removed; cars, houses, shipping containers. |
| 12 | CHAIR WELCH: Okay. Thanks very                 |
| 13 | much.  |
| 14 | MR. MORRIS: You're welcome.                    |
| 15 | CHAIR WELCH: Are there any other               |
| 16 | public comments? I guess not. All right.       |
| 17 | We have a few minutes here on the              |
| 18 | schedule for just discussion among the members |
| 19 | or ramp up comments. I have not really been    |
| 20 | together some kind of a summary that I would   |
| 21 | give of today's events. We've been recording   |
| 22 | the comments and people have been making       |

|    | Page 390                                       |
|----|--|
| 1  | notes.   |
| 2  | But are there any observations of              |
| 3  | the Panel members as to how the day has gone   |
| 4  | or things that have struck you, particularly   |
| 5  | the new members? Michele?                      |
| 6  | MEMBER DIONNE: Well, I think one               |
| 7  | thing that struck me is how well the different |
| 8  | parts of NOAA, the three line offices that we  |
| 9  | talked about today, work together to put       |
| 10 | together a coherent set of products and        |
| 11 | services.                                      |
| 12 | And the other thing that struck me             |
| 13 | was the impression is that this is well known  |
| 14 | within this group and within the line offices  |
| 15 | of NOAA that are involved, but perhaps we      |
| 16 | haven't put together that outreach package.    |
| 17 | And I know there are lots of information       |
| 18 | sheets in the back, and that's part of it.     |
| 19 | But, you know, really how to sell this as a    |
| 20 | unified package to people who are representing |
| 21 | constituents and pulling budget strings is     |
| 22 | probably something that we ought to be         |

|    | Page 391                                       |
|----|--|
| 1  | thinking about.                                |
| 2  | CHAIR WELCH: Thanks, Michele.                  |
| 3  | Other comments? Gary?                          |
| 4  | MEMBER JEFFRESS: We just heard                 |
| 5  | from our friend from the Navy, again t justify |
| 6  | by our existing by polling our users. And      |
| 7  | Texas is a microcosm of like the United        |
| 8  | States. And Texas is broken. They are having   |
| 9  | severe cutbacks in all manner of state         |
| 10 | services, including universities.              |
| 11 | TCOON, we've started doing this                |
| 12 | just recently, is surveying our web users      |
| 13 | because, you know that's the main conduit. We  |
| 14 | have a monthly survey going on right now to    |
| 15 | ask our users why do you use it, what value do |
| 16 | you get out of the use and how often do you    |
| 17 | use; all this sort of things. And it's         |
| 18 | turning into a really valuable tool.           |
| 19 | And it's not our scientific users              |
| 20 | or our program users, it's mainly the public   |
| 21 | that's using it. You know, fishing, sailing    |
| 22 | or wind surfing, all that sort of stuff.       |

|    | Page 392                                       |
|----|--|
| 1  | And the policy makers want to use              |
| 2  | it. And so we are amassing the data to use it  |
| 3  | to justify why they spend money to collect the |
| 4  | data.  |
| 5  | CHAIR WELCH: That's a good                     |
| 6  | comment, Gary. And one thing that the Panel    |
| 7  | has sort of dipped its toe into occasionally   |
| 8  | in the past has been is there a role for the   |
| 9  | Panel to try to solicit this type of comment.  |
| 10 | And when we dipped our toe into that little    |
| 11 | water, we get reminded by our NOAA friends     |
| 12 | that we do have a statutory mandate as to what |
| 13 | this Panel is supposed to do.                  |
| 14 | And, you know our mandate is not               |
| 15 | necessarily to go out and be the advocate for  |
| 16 | NOAA and NOAA navigation programs to the       |
| 17 | general public at large or to specific user    |
| 18 | groups, or to the U.S. Congress. We're all     |
| 19 | free to do whatever we want to in our          |
| 20 | individual capacities, but as a Panel we have  |
| 21 | a little bit of a constraint on us.            |
| 22 | But what we do have the ability,               |

|    | Page 393                                       |
|----|--|
| 1  | is to impress on NOAA, should we choose to do  |
| 2  | so, the value of that type of outreach and     |
| 3  | data collection and use. And so if that's      |
| 4  | something that we want to pursue and pursue in |
| 5  | terms of recommendations to the Administrator, |
| 6  | we're certainly free to do so.                 |
| 7  | And I think one side value of                  |
| 8  | having user panels at our meetings is that     |
| 9  | sometimes that tends to get the community in   |
| 10 | that particular location or region a little    |
| 11 | bit more motivated to on their own make some   |
| 12 | communications to their political              |
| 13 | representatives or their agency folks.         |
| 14 | So, we need to be a little bit                 |
| 15 | careful about what we as a Panel can do        |
| 16 | collectively to these third parties. Because   |
| 17 | ultimately our mission is to report back to    |
| 18 | NOAA.  |
| 19 | Yes?   |
| 20 | MEMBER BRIGHAM: Yes, just to                   |
| 21 | follow-on what Michele said. I think this is   |
| 22 | a little parochial, but I think you need to    |

|    | Page 394                                       |
|----|--|
| 1  | brief the Alaska delegation of all the         |
| 2  | wonderful things you're doing. I knew some of  |
| 3  | them beforehand, but I think the notion is for |
| 4  | Alaska that there's not much attention given   |
| 5  | in this new era of a new Arctic, whatever that |
| 6  | means. And so it's very specific and you're    |
| 7  | supposed to argue for the nation's interest.   |
| 8  | But I think the delegation, their staffers     |
| 9  | need some education here on all the elements,  |
| 10 | particularly related to Arctic.                |
| 11 | CHAIR WELCH: Yes.                              |
| 12 | MEMBER BRIGHAM: It doesn't                     |
| 13 | require the Administrator to go there, but it  |
| 14 | requires maybe line officers to just go brief  |
| 15 | the staffs.                                    |
| 16 | CHAIR WELCH: And, actually, there              |
| 17 | have been a couple of bills introduced in      |
| 18 | prior Congress and in the current Congress by, |
| 19 | I think Senator Baggage's bill                 |
| 20 | MEMBER BRIGHAM: And Murkowksi.                 |
| 21 | CHAIR WELCH: and maybe Don                     |
| 22 | Young that are oriented towards Arctic mapping |
|    |  |

|    | Page 395                                       |
|----|--|
| 1  | and charting. And you know, they probably      |
| 2  | aren't written exactly as we would write them  |
| 3  | if we were doing it ourselves or NOAA were     |
| 4  | writing it. But it does show that somebody up  |
| 5  | there has some sensitivity to the issue, it    |
| б  | provides an opportunity.                       |
| 7  | Yes?   |
| 8  | MEMBER MILLER: And since Lawson                |
| 9  | mentioned Alaska, you know the Hawaii          |
| 10 | congressionals have been very, very strong in  |
| 11 | supporting NOAA in terms of getting earmarks   |
| 12 | for two sonars in Hi'ialakai. I mean, there    |
| 13 | has been very, very strong support in Hawaii.  |
| 14 | And I guess my question earlier                |
| 15 | about what are the plans for upgrading things  |
| 16 | in the Pacific, you know he's been very strong |
| 17 | in trying to upgrade things in the Pacific and |
| 18 | so forth. And for instance, the sonars on the  |
| 19 | Hi'ialakai really haven't been used in the     |
| 20 | last two years. They're just sitting on that   |
| 21 | ship. And the guy from the monument, it goes   |
| 22 | up into the monument regularly and it's not    |

|    | Page 396                                       |
|----|--|
| 1  | used at all. And it's partly because of        |
| 2  | competition for ship time and so forth.        |
| 3  | But you know in a jurisdiction                 |
| 4  | like Hawaii where you have such strong         |
| 5  | congressional support, you know to me it would |
| 6  | make sense to make better use of the           |
| 7  | facilities and so forth.                       |
| 8  | CHAIR WELCH: Well, I'll make a                 |
| 9  | political observation. Alaska and Hawaii are   |
| 10 | similar in a lot of ways in the sense that     |
| 11 | they have some congressional delegations.      |
| 12 | MEMBER MILLER: Yes.                            |
| 13 | CHAIR WELCH: And so a lot of the               |
| 14 | support that does exist in a congressional     |
| 15 | delegation, and a very small congressional     |
| 16 | delegation, depends on who is in that.         |
| 17 | MEMBER MILLER: Oh, yes.                        |
| 18 | CHAIR WELCH: And so, for example,              |
| 19 | Senator Stevens of Alaska was a huge NOAA      |
| 20 | supporter and now Senator Stevens is not there |
| 21 | and Alaska has seen you know the people        |
| 22 | that are in the congressional delegation are   |
Page 397 interested, but they don't the clout and they 1 don't have the experience. And they just 2 aren't yet this effective as Senator Stevens 3 was. And he was there close to 40 years. 4 And 5 the same situation with Senator Inouye here. But, you know eventually Senator Inouye will 6 7 no longer be senator and Hawaii will have more 8 junior representatives in its congressional 9 delegation. 10 So, it's great to have an advocate like that in your congressional delegation, 11 12 but nothing is forever. And, you know, people need to think about how do we educate the next 13 14 group of leaders from these small states. And, you know, having the 15 16 Lieutenant Governor here is part of that effort. 17 MEMBER BRIGHAM: Yes, I'd just add 18 19 for the last five decades it's been fish. And 20 so the broader aspects of marine navigation 21 and protection of the place and offshore 22 development and all that was off the far radar

| Page 398                                      |
|---|
| screen. Still kind of fish. So when you       |
| brief the delegation and the staffers, they   |
| need to broaden their horizons. And they are  |
| already, because they hear arctic and climate |
| change and they translate it into sea ice     |
| retreat, but it just might be offshore        |
| development and the intended observations we  |
| need to do that safely.                       |
| So, I think they need some more               |
| education broadening, would be my suggestion, |
| beyond just NMFS and fish.                    |
| CHAIR WELCH: Yes.                             |
| Well, if I could give my sort of              |
| summary observation of what we've done today, |
| particularly for the new members. We had sort |
| of three types of themes or presentations.    |
| We've talked about the need to think          |
| strategically. And NOAA's desire of us for    |
| this Panel to offer strategic type of advice. |
| So as we hear from our speakers,              |
| whether they're from the government or from   |
| the private sector, we need to think about    |
|   |

|    | Page 399                                       |
|----|--|
| 1  | ourselves, you know what are the strategic     |
| 2  | themes that we can draw from these             |
| 3  | presentations?                                 |
| 4  | Then secondly, we have the more                |
| 5  | here and now issues, the current state of the  |
| 6  | budget, some of the specific challenges that   |
| 7  | the users or the Agency out here at this       |
| 8  | particular location might have, and is there   |
| 9  | a goal for the Panel to make any comments      |
| 10 | about things like that?                        |
| 11 | And then our interest in what the              |
| 12 | private sector people have to say about it and |
| 13 | us, the Panel, providing the mechanism to      |
| 14 | allow those people to give their input to NOAA |
| 15 | and for us to try and reenforce that.          |
| 16 | So, the long range view which the              |
| 17 | NOAA leadership is asking for. The immediate   |
| 18 | program challenges or issues. And then the     |
| 19 | input from the users; the private sector and   |
| 20 | the other public users that maybe could work   |
| 21 | with NOAA.                                     |
| 22 | So, I think you'll find that in                |

|    | Page 400                                       |
|----|--|
| 1  | our future meetings they'll continue to be a   |
| 2  | mixture of these types of presentations. You   |
| 3  | know, we may elevate the line a little bit     |
| 4  | more and diminish another for a particular     |
| 5  | meeting. But that is going to be typical of    |
| 6  | these meetings.                                |
| 7  | And so with that, Kathy, do we                 |
| 8  | have instructions as to what we need to do,    |
| 9  | particularly for tomorrow? I guess we come     |
| 10 | back here first thing in the morning and the   |
| 11 | have a fairly early departure to go to the     |
| 12 | site visits?                                   |
| 13 | MS. WATSON: Yes. The breakfast is              |
| 14 | going to be served out here at the same place. |
| 15 | And then just basically we're going to do a    |
| 16 | recap of day one, whatever.                    |
| 17 | But we're going to be departing                |
| 18 | about 8:45. And we have two mini shuttle buses |
| 19 | that can carry about 17 persons each bus.      |
| 20 | Kyle already has the timeline                  |
| 21 | worked out with Matson. It should take us,     |
| 22 | probably, like 15, 20 minutes to get there and |

|    | Page 401                                       |
|----|--|
| 1  | then, of course, do the site visit. And then,  |
| 2  | hopefully, get back here by lunch.             |
| 3  | CHAIR WELCH: Do we have any kind               |
| 4  | of requirements for identification,            |
| 5  | individually, or                               |
| 6  | MS. WATSON: No, no.                            |
| 7  | CHAIR WELCH: something that we                 |
| 8  | should or should not wear, or any of that kind |
| 9  | of stuff.                                      |
| 10 | MS. WATSON: Well just, I guess,                |
| 11 | comfortable clothing.                          |
| 12 | MEMBER MILLER: No Speedos.                     |
| 13 | Actually, I wondered about shoes.              |
| 14 | Should we make sure to have closed shoes on?   |
| 15 | MS. WATSON: Yes, I would imagine               |
| 16 | closed shoes because if we're going to be      |
| 17 | walking on the ship, we're going to be on the  |
| 18 | bridge.  |
| 19 | Okay. Now one key thing is that-               |
| 20 | _  |
| 21 | CHAIR WELCH: We're not climbing                |
| 22 | up or any of that, steep gangways or anything  |
|    |  |

Page 402 1 like that, are we? 2 MS. WATSON: No. But we are all going to meet over here on the -- what do they 3 call the tour side? That's where the shuttle 4 5 buses will pick us up on the first level, 6 okay. 7 MEMBER DIONNE: But we'll be 8 coming to this room. 9 MS. WATSON: Yes. Because the breakfast is going to be all served here 10 everything. And it's best that everybody meet 11 12 here and then we just walk downstairs. 13 CHAIR WELCH: Okay. Any questions 14 about tomorrow? 15 And then, again, as a reminder for 16 tonight. 17 MS. WATSON: And for dinner we can 18 all meet at the lobby where we all check in, 19 say, at 6:15. And then we can walk to the Hau 20 Tree Lanai. It's just a brief 15 minute walk. 21 Very nice walk. 22 MEMBER MILLER: The aquarium is on

|    | Page 403                                       |
|----|--|
| 1  | the way, and I'm not sure how late it stays    |
| 2  | open. But it's a very nice aquarium. And they  |
| 3  | do have monk seals.                            |
| 4  | CHAIR WELCH: Okay. Well, I thank               |
| 5  | everybody in attendance today, both Panel      |
| 6  | members and NOAA folks and our guests. And     |
| 7  | with that, we'll call the official proceedings |
| 8  | closed for today and hope to see many of you   |
| 9  | tonight.                                       |
| 10 | (Whereupon, the above-entitled                 |
| 11 | matter went off the record at 5:20 p.m.)       |
| 12 |  |
| 13 |  |
| 14 |  |
| 15 |  |
| 16 |  |
| 17 |  |
| 18 |  |
| 19 |  |
| 20 |  |
| 21 |  |
| 22 |  |
|    |  |

| A   | accept 110:4,4         | <b>acquire</b> 379:17 | additional 88:13     | <b>advise</b> 6:11 106:16  |
|---|------------------------|-----------------------|----------------------|----------------------------|
| $\frac{\mathbf{A}}{\mathbf{a}\mathbf{b}\mathbf{a}\mathbf{n}\mathbf{d}\mathbf{a}\mathbf{n}}$ | accepted 81:10         | acquired 247:16       | 190:7 202:7 245:3    | advised 73:17              |
| abandon 271:9   | access 61:10 62:6      | acquisition 198:12    | 251:1 383:10         | advising 106:1             |
| abandoned 271:10  | 208:12 219:15          | 379:14                | address 4:3 15:6     | Advisor 368:9              |
| Abercrombie<br>13:18  | 267:14 376:22          | acronym 272:12        | 79:13 91:7 104:3     | advisors 106:11            |
|   | 379:6 387:14           | acronyms 231:13       | 111:13 169:11        | advisory 6:8               |
| <b>ability</b> 56:19 57:4<br>58:6 143:2 167:7   | accessible 215:12      | act 94:12 210:6       | 172:17 319:12        | 111:16 255:21              |
| 188:16 345:12   | 217:3                  | 331:5 352:5,22        | 320:1 324:14         | advocacy 62:6,16           |
| 357:14 392:22   | accessing 210:12       | acted 53:9 54:15      | 328:5 333:18         | 80:1 114:18                |
| <b>able</b> 18:3,8,11   | accidents 128:15       | action 144:10,13      | 362:9                | 151:21 371:3               |
| 21:13,15 34:13  | 279:21 299:14          | 145:11,18 193:5,8     | addressed 155:6      | advocate 32:9              |
| 57:11 58:2 63:21  | accomplish 209:15      | 193:15,19             | 173:7                | 392:15 397:10              |
| 71:14 93:19   | 370:21                 | actions 144:14,15     | <b>add-on</b> 265:13 | advocating 152:21          |
| 110:19,20,22  | accomplished           | active 32:22 282:5    | adequate 126:16      | aerial 215:11 216:8        |
| 110.19,20,22  | 209:14                 | 364:2,4 379:7         | adequately 370:11    | <b>affairs</b> 81:12 85:20 |
| 142:17 207:19   | accomplishing          | actively 86:19        | adjust 363:14        | affect 36:8 49:11          |
| 211:22 213:11,15  | 165:2                  | 189:21 191:3          | adjusting 7:18       | 56:9,16 303:14             |
| 214:1,4,17 215:15   | accomplishment         | 331:16 334:9          | adjustment 214:9     | 306:20 316:19              |
| 216:14,14 217:11  | 220:4                  | 378:22                | administer 79:7      | 336:1                      |
| 218:2,14 219:1,5  | accomplishments        | activities 65:12,12   | Administration 1:4   | affiliation 19:22          |
| 219:21 220:5,16   | 178:7 179:18           | 94:5 159:12           | 6:6 67:17 109:13     | 72:9                       |
| 221:1,19 223:6  | 213:20 217:5           | 183:21 189:7          | 109:15               | <b>affirm</b> 10:17        |
| 229:7 231:7,12  | 236:7 237:22           | 196:17 199:5          | Administrations      | afford 27:10               |
| 235:6 249:21,21   | <b>account</b> 264:2   | 201:21 209:17         | 65:15 113:12         | 300:17                     |
| 249:22 251:21   | 358:9 365:1            | 222:7 223:1 238:7     | administrative 7:7   | <b>aft</b> 348:13          |
| 253:21 258:5  | accountability         | 264:16                | 175:8 266:17         | aftermath 285:22           |
| 261:20 264:22   | 266:16,19              | activity 22:22 26:5   | 267:1 274:12         | afternoon 92:15            |
| 269:1,2 286:9,10  | accumulating           | 30:7 43:4 101:15      | Administrator        | 159:19 175:15              |
| 287:14 353:1  | 66:17 67:12            | 132:16 152:10         | 2:17 13:5 38:19      | 177:4,7 369:8              |
| 358:22 359:1  | accuracies 208:20      | 179:22 216:11         | 114:16 120:18        | <b>age</b> 289:16          |
| 361:10 372:19   | 247:7 377:11           | 304:17                | 145:2 393:5          | agencies 15:17             |
| 373:3 376:22  | <b>accuracy</b> 383:16 | actors 366:22         | 394:13               | 90:11,12 95:14             |
| above-entitled  | accurate 15:12         | actual 45:10 87:21    | administrators       | 102:3 177:8                |
| 116:4 176:20  | 70:15 210:9 213:8      | 190:13,14 201:15      | 115:17               | 178:10 180:11              |
| 274:8 403:10  | 214:3 234:2            | 202:3 219:13          | admirable 42:18      | 184:14,16 194:13           |
| abruptly 189:15   | 289:19 370:7           | 334:22 339:9          | <b>admit</b> 276:15  | 200:17 219:3               |
| absence 205:1   | 381:12                 | <b>ad</b> 65:4 379:2  | advance 162:22       | 227:21 229:11,14           |
| absolute 221:21   | accurately 229:5       | ADAM 3:12             | advanced 162:20      | 231:11 237:17              |
| absolutely 20:10  | 255:4 286:2            | add 48:22 98:10       | 162:20               | 274:4 301:8                |
| 51:5 139:17 333:1   | accusing 339:7         | 191:9 251:21          | advantage 39:18      | 368:21 371:2               |
| absorb 99:8   | achieve 210:4          | 256:5 397:18          | 118:13 297:4         | 378:1 387:6                |
| abstract 17:8   | 238:20                 | added 201:21          | 369:1                | agency 97:3 104:12         |
| academic 25:22  | achieved 311:17        | 228:1                 | advantageous         | 107:6,7,13 109:22          |
| Academy 290:14  | acknowledge 174:5      | adding 52:2 66:15     | 63:13                | 110:8,17 115:22            |
| accelerate 118:3  | 174:22 192:2           | 243:11,14 357:15      | advantages 256:2     | 131:19 132:12              |
| accelerated 253:18  | 333:7                  | addition 208:11       | advice 106:13        | 134:15,17 158:1            |
| acceleration 253:4  | acoustic 244:6         | 377:5                 | 110:7 398:19         | 176:14 185:14              |
|   | l                      |                       | l                    | l                          |

Г

| 188:15 194:15                         | <b>aim</b> 170:20 375:16      | allotment 173:15                              | anchorage 338:21                      | 266:21 275:15                               |
|---------------------------------------|-------------------------------|---|---------------------------------------|---|
| 240:9 374:5                           | air 64:12 242:18              | allow 34:14 159:1                             | anchoring 135:13                      | 280:9 311:16                                |
| 378:12 383:19                         | 253:2,5,12,19                 | 181:11,15 192:4                               | <b>Andrew</b> 164:18                  | 363:7 380:15                                |
| 385:22,22 393:13                      | <b>airborne</b> 216:4         | 257:8 332:18                                  | Andy 86:13                            | <b>AOOS</b> 366:5                           |
| 399:7                                 | 220:6,21                      | 399:14  | and/or 103:16                         | <b>AOR</b> 381:14,22                        |
| Agency's 163:10,20                    | aircraft 198:4                | allowing 192:8                                | 188:5 312:7                           | <b>APA</b> 282:21                           |
| <b>agenda</b> 13:9 31:1               | 230:5                         | 214:13 298:14                                 | Angeles 292:21                        | apologize 52:5                              |
| 87:19 138:10                          | airport 220:11                | 313:8   | announce 272:21                       | 298:18                                      |
| 275:3 368:21                          | 280:3                         | <b>allows</b> 236:1 256:4                     | announced 112:18                      | appalled 143:1                              |
| agendas 173:6                         | <b>Airports</b> 354:22        | 282:10  | 113:4                                 | apparently 63:5                             |
| age-wise 73:18                        | <b>airways</b> 316:16         | <b>alluded</b> 122:18                         | annoys 333:12                         | appears 128:16                              |
| aggressive 115:13                     | <b>AIS</b> 205:22 206:6       | 145:12  | annual 114:3 219:9                    | 200:13 303:2                                |
| aggressive 115.15                     | 282:3 284:12                  | <b>Aloha</b> 13:7 290:10                      | 287:6                                 | 322:5                                       |
| 211:7                                 | 282.5 284.12                  | 313:16 350:17                                 | <b>annualized</b> 201:15              |   |
| <b>ago</b> 9:11 20:5 23:6             | <b>Alabama</b> 230:3          | alongside 286:5                               | annualized 201:15<br>anonymity 368:15 | <b>Applause</b> 30:16 367:12                |
| 49:7 53:15 81:19                      | Alabama/Mississ               | alteration 370:14                             | <b>answer</b> 19:14,15                | application 252:22                          |
| 49:7 53:15 81:19<br>89:12 98:13 99:20 | 216:9                         |   | 27:22 28:21 52:12                     |   |
| 110:17 127:10                         | <b>Alaska</b> 46:6 58:4       | <b>alternative</b> 41:8,22<br>42:8            | 61:7 155:5 162:4                      | <b>applied</b> 19:4<br>266:17 293:4         |
|                                       | 75:13 100:18                  |   | 214:14 227:12                         | 295:6                                       |
| 128:5,6 147:18<br>178:5 188:1 246:7   | 108:9 127:13                  | <b>altogether</b> 182:12<br>244:13            | 305:20 331:10                         |   |
|                                       | 138:13 140:14                 | . –   | 366:1                                 | <b>apply</b> 186:1 198:22<br>383:2          |
| 252:16 256:21<br>260:16 264:17        |                               | amassing 392:2                                | answered 27:15                        |   |
|                                       | 182:15,17,22                  | <b>amazing</b> 130:1<br><b>American</b> 118:5 |                                       | appointment 6:14                            |
| 290:20 301:11                         | 221:7,11,16 224:1             |   | antenna 73:13                         | <b>appreciate</b> 11:15<br>12:1 15:15 30:11 |
| 312:20 372:21                         | 238:14 240:6                  | 200:3,6 220:20                                | anticipate 134:12                     |   |
| <b>agree</b> 29:19 102:1              | 245:21 268:13,18              | 282:17  | anticipating 23:17                    | 30:12 176:10                                |
| 135:6 138:14                          | 268:20 281:7                  | <b>America's</b> 17:4                         | anxious 90:20                         | 277:5 290:1,2                               |
| 154:13 279:21                         | 323:19 366:6                  | 118:12  | anybody 46:21                         | 309:6,18 313:2,9                            |
| 332:2                                 | 394:1,4 395:9                 | <b>Ameron</b> 348:16                          | 61:12 106:18                          | 314:6 333:14                                |
| agreed 109:18                         | 396:9,19,21<br>Alaskan 147:14 | <b>ammunition</b> 153:8                       | 112:21 143:5                          | 359:5 361:12                                |
| 273:20 327:9                          |                               | 153:9   | 150:20 154:19                         | 367:5 383:14                                |
| agreement 223:10                      | alert 21:3                    | amount 16:11                                  | 176:2 187:2,3                         | appreciation                                |
| <b>agricultural</b> 118:10            | Aleutian 183:9                | 26:12 35:18 42:20                             | 208:21 214:21                         | 383:21                                      |
| <b>Ah</b> 139:15 140:5                | 221:16 323:20                 | 43:5 46:7 52:6                                | 272:2 275:13                          | <b>approach</b> 157:21                      |
| ahead 28:1 119:4                      | Aleutians 224:2               | 96:21 98:15                                   | 276:15 321:21                         | 334:5                                       |
| 169:16 205:21                         | 268:15,17,19                  | 108:17 163:14                                 | 323:8 331:21                          | approached 198:11                           |
| 243:9 246:19                          | 383:7                         | 168:16 190:15                                 | 368:20 369:1                          | approaches 45:22                            |
| 305:10 306:3                          | <b>algal</b> 261:17           | 204:12 215:18                                 | 372:15                                | <b>appropriate</b> 13:10                    |
| 313:3,13,15                           | algorithms 232:17             | 232:15 269:21                                 | <b>anymore</b> 60:13                  | 41:17 42:14 44:19                           |
| 323:10                                | align 199:14                  | 377:4   | 113:16,16 154:17                      | 47:17 48:2,18,20                            |
| AIC 285:3                             | aligned 50:17                 | amounts 65:3                                  | 165:12 253:14                         | 97:8 154:4 180:16                           |
| <b>aid</b> 188:9,10 320:13            | alleged 153:19                | 197:18  | 278:17                                | 188:17 190:21                               |
| 320:19 349:1                          | allegiance 10:21              | analysis 149:11                               | anyone's 203:22                       | appropriated                                |
| aids 285:2 286:11                     | Allen 339:14                  | 158:17 203:16                                 | <b>anytime</b> 66:16                  | 65:10 169:3                                 |
| 287:11 313:20                         | 349:18                        | <b>analyze</b> 206:13                         | 110:6 288:18                          | 225:18                                      |
| 314:18,21 320:1                       | allocated 317:16              | analyzing 211:11                              | <b>anyway</b> 24:14                   | appropriately 45:1                          |
| 320:16 348:9                          | <b>allocation</b> 142:21      | anchor 135:12                                 | 78:15 141:10                          | appropriating                               |
| 349:3                                 | 143:12 170:20                 | 338:22 348:1                                  | 150:3 197:4                           | 65:17                                       |
|                                       | I                             | l   | l                                     | l   |

|                       |                            |                     |                         | rage to                   |
|-----------------------|----------------------------|---------------------|-------------------------|---------------------------|
| appropriation         | 288:2,18,21                | <b>ARTHUR</b> 2:10  | 247:20                  | authorized 178:21         |
| 143:18 154:3          | 295:10 307:22              | ashore 297:10       | association 2:2         | automatic 154:7           |
| appropriations        | 312:14 314:1               | 304:9 310:12        | 4:15 77:22 80:4         | 282:2                     |
| 26:10 37:12           | 315:21 316:12              | 335:22 336:2,3,14   | 84:17 117:20            | automatically             |
| 143:21 154:7          | 317:13 355:8               | aside 31:11 86:10   | 277:18,22 282:17        | 154:2                     |
| 352:17                | 372:6 374:2 375:8          | asked 15:6 31:22    | 282:19 362:2,3          | autonomous                |
| approval 34:7         | 379:1 388:22               | 111:14 158:17       | Asst 2:17               | 139:16 140:6              |
| 55:12 59:2 254:13     | areas 26:18 27:19          | 198:2 223:5         | <b>assume</b> 159:13    | autonomy 26:11            |
| 378:5                 | 46:16 59:10 87:22          | 290:21 306:9        | 205:6 356:4             | availability 192:7        |
| approved 285:19       | 97:4,7 108:6,9             | 310:12 349:6,22     | assuming 69:4           | 344:7 355:11              |
| approving 240:12      | 151:5 164:10               | asking 33:3 94:9    | 167:22                  | available 147:10          |
| approximately         | 170:16,17 171:14           | 100:20 117:6        | assumptions             | 158:16 162:2              |
| 195:16 240:2          | 184:3 186:9 203:4          | 399:17              | 143:22                  | 168:16 180:14             |
| 319:6                 | 206:11,15 210:10           | asks 30:2 229:9     | <b>assure</b> 310:16    | 211:21 216:22             |
| Apra 386:21 387:5     | 215:18 216:17              | Aslaksen 231:12     | astronomically-b        | 222:5 287:2               |
| <b>April</b> 131:5    | 221:7,9 225:21             | aspect 41:15 69:2   | 245:14                  | 327:14 364:11,21          |
| aquarium 402:22       | 269:8 282:22               | 169:11 282:20       | atmosphere 32:17        | 377:13                    |
| 403:2                 | 283:12 285:13              | 336:22 351:8        | 233:13                  | <b>Avenue</b> 1:16        |
| arcane 17:8           | 299:22 303:3               | 354:17              | Atmospheric 1:3         | average 245:12            |
| architects 76:8       | 321:11 357:17              | aspects 18:15       | 6:6 24:8 76:21          | 251:15 259:18,19          |
| archive 192:6         | 369:22 372:9               | 270:16 397:20       | 233:4 234:8             | 310:4                     |
| archives 147:10,22    | 375:16 379:11              | assess 251:9 364:10 | atoll 279:2,18          | averaging 344:10          |
| 148:7                 | 383:2 386:19               | assessment 75:16    | atolls 369:15 372:3     | avoid 296:4 297:3         |
| arctic 40:7 43:10     | <b>argue</b> 120:20 140:5  | 239:18 273:1        | <b>ATONIS</b> 315:3,4,5 | awaiting 254:12           |
| 43:13,18 44:2,7       | 394:7                      | 352:17              | 320:15,18               | aware 21:3 28:19          |
| 45:2,7,11 47:1        | argument 62:9              | assessments 372:19  | attached 192:1          | 33:16 36:16 43:19         |
| 75:14,15,16 97:4      | 71:5 120:4,18              | asset 163:22 186:5  | attempt 199:4,14        | 143:14 151:7              |
| 97:6,13 98:21         | 168:14                     | 329:10,14           | attendance 403:5        | 196:17 211:6              |
| 99:1 100:21 101:3     | arguments 119:20           | assets 58:1 158:3   | attendant 198:5         | 288:7 310:4,5             |
| 101:12,16 102:4       | 168:22                     | 180:14,17 184:12    | attending 6:17          | 325:6 334:2,6             |
| 126:10 141:1          | Armstrong 86:13            | 327:19 330:3        | attends 301:1           | 375:1                     |
| 186:13,14,21          | Army 2:22 3:11             | 331:1 357:21        | attention 96:21         | awareness 28:22           |
| 187:14 189:1,19       | 178:22 196:5               | 359:8 376:7 383:2   | 112:5 121:7             | 124:18                    |
| 386:16,19 394:5       | 228:15 280:7               | assigned 300:19     | 124:19 128:2            | <b>awful</b> 40:13 308:15 |
| 394:10,22 398:4       | 325:16 329:15              | 381:21              | 131:17 132:2            | awfully 314:11            |
| Arctic-type 183:6     | <b>ARRA</b> 201:20         | assist 22:7 304:16  | 148:19 149:5            | <b>Ayu</b> 183:8,16       |
| <b>area</b> 44:8 49:6 | arrangement 331:2          | 317:14 376:3        | 313:21 394:4            | Azipod 281:17             |
| 79:21 129:8 130:7     | <b>array</b> 372:5         | assistance 22:1     | attracted 12:9          | <b>A&amp;E</b> 377:8      |
| 131:14 147:20         | arrears 108:8,11           | 138:18 353:16       | attractive 66:18        | <b>A&amp;M</b> 27:14 69:1 |
| 151:13,13 164:20      | arrested 166:14            | 389:5               | attributes 371:11       | 82:4 116:12               |
| 173:11 189:2,4        | <b>arrival</b> 21:1 288:12 | assistant 13:5      | <b>audience</b> 275:18  | A-F-T-E-R-N-O             |
| 191:8,9 206:16        | arrivals 22:11,13          | 14:20 38:19 113:1   | Aussies 346:10          | 177:1                     |
| 215:5 216:3,6,9       | 23:18 308:3                | assistants 112:11   | Australia 82:7          | <b>a.m</b> 1:17 6:2 116:5 |
| 217:7,16,22 218:7     | arriving 342:7             | 112:11              | authorities 62:2        | 116:6                     |
| 221:13 224:22         | <b>arrow</b> 249:11,12     | associate 117:7     | 66:4                    |                           |
| 242:4 257:15          | <b>arrows</b> 153:9        | 118:17              | authority 263:5         | B                         |
| 279:20 287:17         | 295:14                     | associated 82:11    | 354:19                  | <b>b</b> 1:19 67:2        |
|                       |                            |                     |                         |                           |
|                       |                            |                     |                         |                           |

٦

|                       | 100 10 000 01             |                           |                            |                          |
|-----------------------|---------------------------|---------------------------|----------------------------|--------------------------|
| back 9:14 11:7        | 182:10 298:21             | 225:16 226:3              | 260:15,22 261:2            | 152:1 272:17             |
| 22:17 25:1 30:12      | 301:10                    | 254:8 278:19              | beach 1:15 60:17           | 278:6 310:8 346:1        |
| 38:3 54:22 55:5       | <b>badly</b> 384:9        | <b>based</b> 63:14 134:1  | 61:19 72:17,18             | 346:20 382:19            |
| 55:11,12 59:3,9       | baggage 124:2             | 146:12 152:22             | 74:8 97:13 251:3           | 384:17 402:11            |
| 66:10 69:20 70:2      | Baggage's 394:19          | 187:9 202:3               | 292:17,18 293:12           | <b>bet</b> 135:16 136:21 |
| 81:17 86:19 89:1      | bailiwick 324:18          | 208:15 212:1              | 294:1 296:16,22            | <b>better</b> 25:7,13    |
| 91:5 104:5 114:15     | Baker 2:2 4:15            | 215:18 220:2              | 304:3 305:7,8,13           | 43:16 50:9 120:4         |
| 115:4 116:3 117:5     | 277:18,20 308:20          | 223:8 224:17              | 336:14 343:21              | 120:17 121:18            |
| 119:1 120:20          | 337:21 338:12,19          | 356:7                     | <b>beaches</b> 203:19      | 128:22 131:13            |
| 126:14,21 135:21      | 339:11 340:13             | <b>baseline</b> 35:3 99:6 | 336:12,15                  | 149:13 157:15,21         |
| 145:5 146:14          | 360:3                     | 111:8 228:2,4             | <b>beam</b> 328:15         | 170:19,20 199:14         |
| 147:12 149:20         | <b>balance</b> 96:11,22   | baselines 372:18          | <b>bear</b> 10:20 355:12   | 208:20 218:7             |
| 154:1 156:8,12,16     | 169:22 170:2              | <b>basic</b> 17:4 18:2    | <b>beat</b> 309:10         | 220:9 244:1 255:5        |
| 157:6 163:8,16        | balancing 29:7            | 34:14 66:12 208:4         | beautifully 47:14          | 286:20 318:21            |
| 171:6 179:17          | 189:7                     | 228:14,19                 | <b>becoming</b> 281:21     | 319:19 329:14            |
| 189:22 198:20         | <b>balking</b> 253:13     | basically 17:3 26:9       | <b>began</b> 332:4 338:6   | 382:18 387:3             |
| 199:4,21 205:4        | Ballroom 1:15             | 26:12 58:1 63:7           | beginning 337:22           | 396:6                    |
| 214:14 216:6,7,21     | <b>balmy</b> 307:8        | 119:14 202:11             | 372:10                     | <b>beyond</b> 157:19     |
| 218:21 235:4,4        | Balser 2:8 329:21         | 206:3 210:10              | <b>begun</b> 112:9         | 163:20 367:15            |
| 249:14 250:16         | 329:22                    | 218:22 233:18             | <b>behalf</b> 13:18        | 398:11                   |
| 253:21 254:9          | Baltimore 133:20          | 305:16 316:15,20          | 370:22                     | <b>big</b> 20:5 34:12    |
| 263:8 269:5           | <b>Barbers</b> 308:21     | 317:1 331:3               | <b>believe</b> 11:20 45:22 | 37:16 58:21 59:15        |
| 271:10 274:6          | 347:14                    | 359:16 400:15             | 55:1 84:5 101:4            | 62:8 74:19,19            |
| 278:9,14 280:4,17     | <b>Barbuda</b> 264:18     | <b>basin</b> 249:8        | 127:1 174:10               | 78:13 108:3              |
| 281:3 286:19          | 265:3                     | <b>basins</b> 286:3       | 182:8 193:12               | 117:13 127:13            |
| 290:7 291:15          | <b>barge</b> 140:16 288:2 | <b>basis</b> 38:9 39:2    | 199:6,11 223:2             | 137:14 138:4,10          |
| 293:16 294:7          | 306:17 310:13             | 48:3 130:10               | 230:8 272:20               | 142:22 150:16            |
| 296:21 298:2          | 340:7 341:22              | 211:13 221:1              | 364:13,18 382:19           | 178:3 179:19             |
| 302:2 324:8 347:5     | 342:5,14,17 343:4         | 340:14 354:13             | <b>bells</b> 249:20 256:5  | 219:10 225:16            |
| 348:12,18 350:22      | 343:4,5,11 344:16         | <b>bat</b> 207:19         | belong 282:18              | 255:11 259:6,7           |
| 361:8 362:15          | 344:17,17 345:7           | <b>bathy</b> 188:9,10     | benchmarks                 | 262:15 270:20            |
| 379:22 382:4,8,13     | 348:15,20 349:13          | bathymetric               | 208:17                     | 271:11 272:8             |
| 390:18 393:17         | 349:14,17,19              | 178:19 186:6              | <b>benefit</b> 50:19,22    | 281:4 288:12             |
| 400:10 401:2          | 350:1,18 351:1            | 213:1 373:19              | 86:4 173:13 210:5          | 289:7 301:15             |
| backbone 44:18        | barges 181:17             | bathymetry 125:4          | 210:19 218:11              | 304:11 307:22            |
| 47:16                 | 292:2,3 306:16            | 125:13 131:21             | 363:11                     | 314:17 321:11            |
| background 8:13       | 341:14 342:4              | 186:1 204:1               | <b>benefits</b> 219:9,17   | 322:10 336:3             |
| 72:11 82:6 89:4       | 344:10,11,12,15           | bathyometers              | 232:1 354:15               | 339:21 342:16            |
| 179:16 306:5          | 345:3,5,21 347:5          | 322:9                     | <b>benthic</b> 185:15      | 343:13 344:6,17          |
| 377:20                | 347:8,9 349:10            | <b>baton</b> 309:17       | 328:16                     | 349:9                    |
| backgrounds 12:5      | 350:3,21 351:5            | battle 37:16 155:19       | Bering 183:10              | <b>bigger</b> 64:13 67:2 |
| 12:9                  | Barge/Young 2:20          | 170:2                     | 189:2                      | 136:20 172:13            |
| backscattered         | barometers 204:17         | bay 128:18 129:9          | <b>berth</b> 344:7         | 344:15                   |
| 185:21                | barrel 296:13,14          | 129:22 130:16             | berthing 344:19            | biggest 133:19           |
| backups 356:12        | 343:5 344:17,18           | 217:6,7,16,18             | <b>best</b> 24:14 34:10    | 261:15                   |
| <b>bad</b> 34:7 124:6 | <b>Barrow</b> 269:4       | 251:2,4 254:17            | 90:4 93:16 110:2           | <b>bill</b> 3:16 111:3,7 |
| 127:15,16 156:21      | <b>base</b> 63:7,14       | 256:18,18,19              | 146:22 147:22              | 156:3 297:1              |
|                       |                           |                           |                            |                          |

Г

| 394:19                     | <b>blew</b> 150:10        | 334:16,22 335:5         | breakfast 400:13          | 316:15                    |
|----------------------------|---------------------------|-------------------------|---------------------------|---------------------------|
| <b>billion</b> 23:11 219:9 | <b>block</b> 26:9         | <b>booked</b> 241:5     | 402:10                    | broadcasts 316:20         |
| <b>billions</b> 133:22     | <b>blood</b> 152:19       | border 279:19           | <b>Brian</b> 3:10 4:4     | broaden 398:3             |
| <b>bills</b> 394:17        | <b>bloom</b> 261:17       | border-to-border        | 11:12                     | broadening 156:7          |
| <b>bin</b> 237:4           | <b>blow</b> 270:20 307:4  | 209:3                   | <b>bridge</b> 253:9,11,22 | 398:10                    |
| <b>bins</b> 245:10         | <b>blowing</b> 358:6      | <b>boss</b> 290:21      | 281:13 309:4              | <b>broader</b> 18:17      |
| biofouling 244:9           | <b>blown</b> 183:10       | <b>Boston</b> 251:2     | 314:21 315:1              | 119:19 122:12             |
| biologists 203:17          | <b>blows</b> 347:10       | <b>bottle</b> 303:20    | 401:18                    | 185:11 397:20             |
| <b>birds</b> 337:4         | <b>Blucher</b> 82:3,10    | bottlenecks 118:19      | <b>brief</b> 31:2 209:13  | broadest 139:1            |
| <b>birth</b> 23:19 24:1    | <b>blue</b> 248:20 307:11 | <b>bottom</b> 201:7     | 394:1,14 398:2            | broadly 28:1 145:9        |
| <b>bit</b> 7:16 8:22 16:1  | blueprints 82:21          | 202:10 204:19           | 402:20                    | 240:20                    |
| 20:8 25:13 32:16           | <b>blurb</b> 348:3        | 224:16 242:17           | briefing 197:8            | broke 183:11              |
| 40:8 43:15 68:6            | <b>board</b> 94:5 255:21  | 248:15,17 268:10        | 236:14                    | broken 59:8 391:8         |
| 72:4,10,10 75:17           | 283:14 284:4              | bottom-line 50:16       | briefly 148:11            | Bros 4:19 292:2           |
| 81:14 87:19 88:15          | 299:5,9 339:4             | <b>bought</b> 343:10    | 207:10                    | 306:17 310:14             |
| 94:7 95:2 96:5             | 348:13,21 356:9           | boundaries 228:18       | Briggs 171:22             | 343:2                     |
| 99:3 100:10 102:6          | 356:11                    | boundary 82:16,17       | Brigham 1:20              | Brothers 2:5,21           |
| 103:5 120:14               | <b>boat</b> 2:12 77:21    | <b>Bow</b> 150:9,14     | 75:11,12 100:17           | 342:18 349:7              |
| 121:1,21 122:19            | 78:5,16 130:19            | 160:1                   | 100:17 102:9              | brought 72:11             |
| 124:7,9 125:15             | 136:16 161:21             | <b>bows</b> 153:9       | 126:9 138:12,13           | 139:8 149:21              |
| 129:7 145:5 161:8          | 168:6 301:13,19           | <b>box</b> 63:9 336:17  | 197:16 198:1,13           | 302:19 355:10             |
| 163:20 171:13              | 309:2 322:6,19,20         | <b>boxes</b> 63:8 345:7 | 226:14,18,21              | 362:7                     |
| 183:12 187:19              | 327:8 330:8               | <b>boy</b> 32:2 33:8    | 227:3,7,14,19             | <b>bucks</b> 19:11 150:16 |
| 193:8 199:6                | 339:18 347:15,21          | <b>BP</b> 156:12 160:8  | 323:11 366:4              | <b>budget</b> 18:4,5      |
| 209:10 219:12              | 348:17                    | 161:15                  | 393:20 394:12,20          | 23:10,13 33:16,16         |
| 224:16 226:3               | <b>boater</b> 24:13 306:6 | bracing 331:22          | 397:18                    | 33:17,20,22 34:3          |
| 229:12 233:21              | boaters 78:5              | <b>Brad</b> 2:5 4:18    | <b>bright</b> 249:4       | 34:20,20,22 35:2          |
| 238:11 242:1,9             | boating 78:11             | 292:2 299:7 306:2       | <b>bring</b> 45:8 47:1,18 | 35:7,9 38:9,19            |
| 251:5 257:7                | 356:13                    | 306:2 341:20            | 52:8 64:13 72:19          | 46:20 51:10 53:2          |
| 263:15 274:6               | boats 78:14 161:19        | 357:8 361:17            | 132:1 146:5 150:1         | 53:4,7,8,11,12,19         |
| 285:1,17 299:2,17          | 181:18 282:14             | Bradley 2:10 62:20      | 158:14 161:17             | 53:20 54:3,8 55:1         |
| 306:8,10 341:21            | 286:6 289:9 322:9         | 62:22 85:17,17          | 168:7 181:16              | 55:3 56:2,17              |
| 347:14 362:8,22            | 322:16 325:19             | 171:18,19 200:2,7       | 182:8 190:13              | 58:20,21 59:1,20          |
| 362:22 364:4,5             | 330:9 336:4 343:3         | 200:18 266:20           | 236:11 263:9              | 61:11 63:1 67:18          |
| 371:10,20 392:21           | BoatUS 77:21              | Brad's 327:1            | 269:5 289:12              | 85:19 107:16              |
| 393:11,14 400:3            | 78:11,11                  | branch 2:5 4:21         | 291:19 318:22             | 108:4 109:4 110:2         |
| black 221:7 317:1          | <b>Bob</b> 2:3,12 4:16    | 83:1                    | 319:3 322:17,18           | 110:9 119:10,12           |
| Blackwell 2:9 4:11         | 87:10,11 290:9,12         | brand 30:5              | 322:19 330:21             | 119:13,21 120:1           |
| 80:18,19 207:1,3           | 306:15 310:11             | breadbasket             | 331:5 340:5,13,16         | 120:19,22 127:2,6         |
| 226:13,16,19               | 357:9                     | 118:12                  | 356:6 364:4               | 136:2,11,15               |
| 227:1,6,8,17               | <b>bodies</b> 187:21      | break 20:2 31:11        | <b>bringing</b> 253:13    | 143:17 151:2,9            |
| 228:3 230:6 231:5          | 188:5                     | 88:16,17 91:22          | 262:9 272:8               | 167:21 168:20             |
| 233:16 376:5               | body 42:22 140:9          | 92:15 115:4 116:1       | 340:21 344:12             | 178:4 188:21              |
| 377:5                      | <b>bold</b> 91:9          | 119:7 175:15            | <b>brings</b> 303:10,11   | 197:18 201:4,11           |
| blank 29:2                 | <b>Bond</b> 2:2 4:17      | 177:11 219:11           | 379:20                    | 202:6 224:18              |
| bleaching 370:11           | 298:3,5 331:3             | 274:5 335:8             | broad 237:5               | 225:3,6,7,11,17           |
| blended 38:13              | 332:2 333:1,4             | 341:15 345:12           | broadcast 316:14          | 265:11 266:10,12          |
|                            | l                         |                         | l                         | l                         |

|                            | 1                           | 1                  | 1                         |                           |
|----------------------------|-----------------------------|--------------------|---------------------------|---------------------------|
| 267:5,6,8 308:13           | 159:22 168:15               | capability 101:20  | captain 6:20 7:5          | Carothers 1:21            |
| 352:13 353:4               | 306:14 353:20               | 170:1 220:4        | 13:6 30:17,22             | 73:20,21 87:4             |
| 375:4,5,11 378:4           | 384:19                      | 285:20 328:7       | 57:15 72:15 75:20         | 161:6,7 162:6             |
| 384:2 390:21               | businesses 15:17            | 330:8,11 359:11    | 80:12 85:7 88:4           | 324:12,13 325:8           |
| 399:6                      | <b>BUTO</b> 2:10            | 389:3              | 93:4,12 113:1             | 325:14 326:8              |
| budgetary 57:20            | <b>button</b> 186:11        | capable 181:12     | 116:8 119:1,5             | carriage 165:1            |
| budgeting 81:11            | 239:22 262:3                | 325:5 328:15       | 130:5 132:6,16            | carriers 101:18           |
| <b>budgets</b> 16:4 97:4   | 268:5                       | 329:9              | 133:1 135:8 143:9         | 198:4 387:9               |
| 120:1 146:9                | <b>buttress</b> 107:14      | capacities 392:20  | 158:11 165:14             | <b>carries</b> 124:3      |
| 163:13 374:6               | <b>buy</b> 139:13,17        | capacity 210:9     | 170:10 174:2              | carry 93:18 114:10        |
| budget's 311:7             | 169:14                      | 255:19             | 177:16 178:8              | 114:20 120:20             |
| budget-dependent           | ~                           | capital 30:12      | 187:16 193:7              | 140:9 400:19              |
| 224:16                     | <u> </u>                    | 265:15             | 225:9 277:17              | cars 343:7 389:11         |
| <b>buffet</b> 176:12       | <b>cabinet</b> 11:18        | capitalize 318:4   | 290:5,9,19,22             | Carter 376:19             |
| <b>build</b> 136:3 185:9   | cable 280:20                | Capitol 124:7      | 291:17 292:14             | cartoon 269:12            |
| builder 189:15             | 281:19                      | 127:11             | 294:15 298:2              | case 17:6 18:17           |
| <b>built</b> 291:8         | <b>cadre</b> 6:15           | Capt 1:22,22 2:2,3 | 302:2 306:15              | 107:14 110:20,21          |
| <b>bulk</b> 101:18 253:9   | calculated 160:17           | 2:13,18 4:8,10,15  | 308:20 309:15             | 110:22 111:9              |
| <b>bullet</b> 215:3 217:19 | 215:19                      | 4:16 7:2 9:22      | 310:11,13 312:11          | 140:8,8 180:15,18         |
| 220:3 222:2,17             | calibrate 217:9             | 10:5 30:19 31:4,8  | 322:2 326:4               | 181:16 184:1,18           |
| 238:18 240:8               | California 74:9             | 45:21 46:3 57:19   | 327:13,18 333:17          | 254:14 273:15             |
| 243:22                     | 98:13 159:20                | 80:12 85:6 86:3    | 337:16 343:17             | 353:2,20 354:8,13         |
| <b>bulletin</b> 323:13     | 324:19 347:22               | 87:7,10 88:18      | 349:21 355:22             | 374:13 384:20             |
| <b>bum</b> 275:13          | <b>call</b> 22:13 29:3 84:1 | 90:17 132:14       | captains 294:21           | 385:15                    |
| <b>bunch</b> 10:8 22:3     | 91:17 133:7 160:1           | 136:5,8 158:12,22  | 296:9 297:6               | cases 62:9 378:11         |
| 75:21 114:7,11             | 166:20 278:21               | 159:8 162:9,13     | capture 216:10            | casts 204:17              |
| 117:1 304:7 309:7          | 342:8,10 402:4              | 164:8 174:4        | <b>car</b> 275:11,15      | catalog 158:1             |
| 309:19                     | 403:7                       | 177:19,21 178:11   | <b>cards</b> 384:17       | catastrophic              |
| <b>bunker</b> 343:12       | called 14:21 26:3           | 178:15 179:14      | care 12:20 65:18          | 270:18 326:19             |
| <b>buoy</b> 272:6 283:9    | 38:8,13 91:8                | 182:5,16 183:5     | 343:9                     | <b>catch</b> 128:13 178:2 |
| 284:16 285:6,7             | 100:11 242:8                | 192:19 193:17,20   | career 61:7 79:3          | 284:11                    |
| 311:20 315:13              | 247:5 259:13                | 196:6,16,20 197:4  | 80:21                     | categories 36:15          |
| 317:2,2,17                 | 282:15 293:4                | 197:9,20 198:9,14  | careful 393:15            | 237:5                     |
| <b>buoys</b> 272:15        | 332:10                      | 201:2 202:15,18    | <b>cargo</b> 65:4 80:5    | categorized 210:2         |
| 314:20 317:9,10            | callers 284:11              | 202:22 204:4       | 255:7,8 288:7             | category 237:22           |
| 317:15,19 319:5            | <b>calling</b> 125:16       | 205:8,15 206:4     | 291:19 342:7,15           | 242:11                    |
| 357:11 360:7               | Camp 385:16                 | 277:20 290:10      | 342:19 350:17             | cattle 281:1,4 340:3      |
| 362:4,9 364:14             | <b>campaign</b> 19:7        | 292:20 293:1       | Caribbean 264:18          | 340:4,12,17,18            |
| <b>Bureau</b> 273:2        | 122:10                      | 333:18 334:17      | 265:6                     | 341:14                    |
| bureaucratic 43:3          | cams 285:11                 | 337:21 338:12,19   | Caribbeans 264:19         | caught 199:6              |
| 138:21 139:5               | <b>Canada</b> 281:4         | 339:11 340:5,13    | Carlson 2:11 368:7        | 230:11 335:18             |
| <b>burn</b> 296:14         | <b>Canal</b> 49:5,11        | 340:16 341:5,8     | 368:7 377:16,16           | caused 232:11             |
| <b>bus</b> 400:19          | candidacy 111:22            | 349:22 350:8       | <b>Carmel</b> 87:6,7      | 302:5 370:14              |
| <b>buses</b> 400:18 402:5  | <b>cap</b> 358:7            | 356:1,8 357:5,16   | <b>Carnival</b> 253:12,14 | caveat 203:1 380:6        |
| <b>Bush</b> 109:12,16      | <b>capabilities</b> 196:4   | 360:3 361:14       | 339:6                     | <b>CDIP</b> 272:12        |
| business 31:16             | 218:8 231:14                | 378:19 386:8       | <b>Carolina</b> 79:4,20   | <b>ceiling</b> 380:11     |
| 49:16 74:6 78:9            | 357:15                      | 387:1              | 154:11 376:21             | <b>cell</b> 164:13 346:22 |
|                            |                             | l                  | l                         |                           |

Г

| <b>cent</b> 153:2        | 19:16 23:17 24:1  | 305:22 313:11             | 83:16 151:2              | 320:8 380:3               |
|--------------------------|-------------------|---------------------------|--------------------------|---------------------------|
| <b>center</b> 4:12 20:22 | 24:4 25:19 27:11  | 316:3 321:18              | 212:18 213:12,13         | <b>charted</b> 100:22     |
| 21:4,6 26:4 45:9         | 28:10 30:14,17,21 | 323:7 324:11              | 225:8 262:19             | 128:17                    |
| 81:4 82:22 127:3         | 52:14,17,20 54:6  | 326:12 327:21             | 263:4 277:16             | <b>charter</b> 291:21     |
| 200:2,5 233:3            | 54:11 56:6,10     | 328:11 329:18             | 283:20 301:12            | chartered 294:5,7         |
| 234:17 258:2,4,8         | 60:14 64:20 66:15 | 330:17 331:11             | 309:3 370:10,12          | charting 101:21           |
| 259:1 376:19             | 69:7 70:17 71:9   | 333:6 334:19              | 398:5                    | 107:9 111:4               |
| centerline 47:6          | 71:18,22 73:2,5   | 337:12 338:9,15           | changed 38:6             | 130:11 168:2              |
| <b>centers</b> 243:15    | 75:7,15 78:19,22  | 339:9 340:2,11            | 131:12 207:22            | 186:21 187:5,8            |
| 255:16                   | 79:19 87:14 89:16 | 341:3,7,12,16,20          | 234:12 235:11            | 196:7 203:6               |
| centimeter 319:6         | 90:7 92:21 93:6   | 349:20 350:22             | 300:20,20                | 207:16 224:18             |
| centimeters 130:12       | 94:15 102:8       | 351:13,15 353:8           | changes 74:15,17         | 226:3 237:10,12           |
| <b>century</b> 126:15    | 103:11 104:10,18  | 354:5 355:20              | 83:17 211:12             | 237:13 320:3              |
| 139:18 146:14            | 106:3,20 109:7    | 361:21 362:16             | 213:16 281:12,16         | 328:19 329:7              |
| 147:7                    | 115:1 116:7       | 363:7 365:4,8             | 316:11 372:22            | 373:6 378:22              |
| <b>certain</b> 65:11     | 118:21 121:3      | 366:3 367:1,13            | changing 40:6            | 395:1                     |
| 143:22 153:7             | 122:17 123:3      | 368:6,10,14 369:4         | 43:20 147:5              | <b>charts</b> 15:8,12     |
| 169:6 180:5 203:6        | 126:4,20 127:9    | 371:7 373:4,12            | 300:21 372:14            | 44:20 101:12,13           |
| 206:11 378:14,15         | 132:11 133:4      | 374:1,17 376:4            | <b>channel</b> 126:13    | 101:19 129:1              |
| 378:16                   | 137:2,8 141:11    | 377:15 378:18             | 285:6 308:22             | 137:15 164:21             |
| certainly 34:16          | 143:7 145:3 146:2 | 380:21 385:3              | 309:8 348:14             | 166:21 167:2              |
| 35:5,6 46:10             | 146:7 149:17      | 386:7 388:8               | 349:3,4                  | 169:18 179:1,3,4          |
| 47:20 48:9 53:9          | 151:17 153:5,13   | 389:12,15 391:2           | <b>channels</b> 65:20    | 190:14 194:14,22          |
| 55:14 64:1 124:19        | 153:16 154:10     | 392:5 394:11,16           | 178:21 283:15            | 194:22 195:1              |
| 125:4 132:22             | 157:22 158:20     | 394:21 396:8,13           | 286:3,10                 | 202:13,21 203:2,3         |
| 149:16 158:17            | 159:7 160:5 161:5 | 396:18 398:12             | <b>channel's</b> 327:17  | 208:8 235:17              |
| 159:1 188:14             | 162:16 164:12     | 401:3,7,21 402:13         | <b>charge</b> 151:11     | 318:7,8,10 327:12         |
| 206:11 215:10            | 165:8 166:16      | 403:4                     | 155:22 236:18            | 373:7 381:15,15           |
| 228:17 231:16            | 167:11,17 170:7   | Chairman 6:7              | 280:1 329:2              | 385:13 388:12             |
| 234:4 244:14             | 171:17 174:1      | 151:15 169:21             | <b>charged</b> 150:12,20 | <b>chart's</b> 319:13,16  |
| 284:7 289:14,17          | 175:2,16,21 176:6 | 356:15                    | 161:4                    | chassis 345:8             |
| 353:15 354:3             | 177:3,20 178:8,12 | Chairperson 90:16         | <b>charging</b> 150:16   | <b>chatting</b> 16:1 33:3 |
| 379:11 380:8             | 179:12 182:2,13   | <b>challenge</b> 16:7,15  | 151:10                   | cheaper 118:7             |
| 386:11,17 393:6          | 183:3 197:6       | 37:11 43:21 58:11         | charitably 100:21        | <b>check</b> 193:10       |
| certificate 23:19        | 199:21 200:5,15   | 94:22 103:10              | <b>Charles</b> 257:10    | 287:15 324:8              |
| 24:2                     | 201:1 202:10,16   | 378:11 380:2              | 322:7                    | 402:18                    |
| certificates 190:4       | 202:19 203:10     | challenges 4:8 29:6       | <b>chart</b> 76:13,14    | checking 365:1            |
| certification 190:4      | 205:19 206:19     | 29:14 32:18 44:8          | 97:12 146:19             | <b>check-in</b> 275:7     |
| certified 77:8           | 226:7,10 231:20   | 172:4,16 399:6,18         | 165:4 166:10,11          | chemical 203:16           |
| certify 283:1            | 234:14 252:9,11   | challenging 268:14        | 166:20 167:9,15          | 279:5                     |
| <b>cetera</b> 106:17     | 252:14,18 269:14  | 378:8 379:13              | 169:9,12 171:22          | Chesapeake 256:19         |
| 160:11 196:5             | 269:17 271:16     | chance 61:1 72:2          | 186:2 190:17             | <b>Chevron</b> 343:5      |
| 376:14                   | 272:19 273:6      | 132:3 250:15              | 194:17 207:20            | chief 5:18 25:8 80:7      |
| <b>Chain</b> 183:10      | 274:2,11,22 275:6 | 336:19 347:11             | 212:20 228:22            | 81:15 89:14 112:9         |
| 323:20                   | 275:20 276:6,13   | 350:20 368:22             | 235:7 281:21             | 115:9 381:8               |
| <b>Chair</b> 1:17,19,19  | 290:5 292:13      | Chancellors 26:14         | 291:10 297:5             | chime 151:16              |
| 6:3 11:8 13:4            | 298:1 299:8       | <b>change</b> 26:22 67:15 | 315:5 319:3,7,19         | <b>China</b> 291:15       |
|                          |                   |                           | l                        |                           |

|                            |                            | 1                      | 1                        |                          |
|----------------------------|----------------------------|------------------------|--------------------------|--------------------------|
| 293:11,12,16               | <b>climbing</b> 401:21     | 261:17 262:1           | 251:11                   | <b>come</b> 12:4,10 19:2 |
| 294:7 296:21               | <b>Clinton</b> 371:15      | 265:16 273:5           | collaboratively          | 53:16 65:5 77:16         |
| <b>choice</b> 291:2        | <b>close</b> 55:2 74:8     | 282:5 284:22           | 216:14 218:5             | 99:11 100:6 101:1        |
| <b>choose</b> 393:1        | 103:19 139:3               | 285:6 286:13           | colleague 147:13         | 105:1 115:4,14           |
| <b>chore</b> 355:16        | 228:21 254:17,21           | 289:8 291:13,14        | 175:4                    | 135:1 145:1              |
| <b>Christi</b> 27:14 69:1  | 282:16 284:15              | 291:16 293:18          | colleagues 122:20        | 151:21 155:20            |
| 82:5 116:12                | 297:15 303:18              | 298:10 303:6           | 175:7                    | 160:12 228:20            |
| chronology 248:12          | 361:16 397:4               | 306:22 313:4,14        | collect 15:19 58:6       | 250:16 274:5,19          |
| <b>chunk</b> 225:16        | closed 285:11              | 314:4,9,11,17,22       | 150:15,21 185:6          | 283:18 290:2,6           |
| <b>chunks</b> 34:12        | 286:16 336:15,17           | 315:20 318:12,20       | 191:15 192:10            | 298:14 299:10            |
| <b>circa</b> 148:4         | 401:14,16 403:8            | 320:21 323:12          | 196:10 227:11            | 300:3,14,15 301:3        |
| <b>circle</b> 295:22 296:3 | closely 64:2 74:16         | 324:1 328:21           | 230:17 247:4             | 304:4,9 308:18,19        |
| 347:4                      | 77:2 141:15                | 329:5,16 331:7         | 269:2,3 305:11           | 310:12 319:21            |
| circles 345:22             | 143:19 180:12              | 348:8 351:3            | 386:13,18 392:3          | 322:14,20 323:19         |
| <b>circuit</b> 285:11      | 235:13 239:6               | 376:14,21              | <b>collected</b> 65:8,21 | 328:1,8 333:12           |
| circulation 125:1,3        | 264:11 301:8               | coastal 27:3,10,19     | 165:10 167:15            | 335:21 343:21            |
| 126:16 217:9               | 302:14                     | 38:8,21 39:13          | 215:4,4,12 219:15        | 346:11,13 347:21         |
| <b>citizen</b> 356:14      | closer 112:15              | 40:2,11,19,22          | 220:10 221:8,10          | 379:22 382:4,13          |
| citizens 15:18             | 272:10 365:9               | 69:21 82:12 83:5       | 221:13 314:22            | 384:9 400:9              |
| 28:16 338:4                | <b>closes</b> 343:22       | 83:16 84:1,12,18       | 379:2 386:21             | <b>comes</b> 44:16       |
| citizen's 102:14           | closest 137:12             | 85:1,10 89:6           | collecting 65:16         | 119:16 159:9             |
| City 149:9 180:8           | close-wise 309:7           | 91:16,18 116:20        | 66:8 84:20 147:4         | 171:1 201:14             |
| 181:2                      | closing 170:8              | 116:21 117:2           | 153:18 185:20            | 232:4 288:8 331:6        |
| <b>claim</b> 382:22        | 336:13                     | 121:16 125:12          | 221:6 223:14             | 338:10 346:7             |
| <b>class</b> 256:22        | <b>clothing</b> 401:11     | 155:7 160:9 208:5      | 230:8                    | 347:3 354:17             |
| classification             | <b>cloud</b> 346:12        | 212:17,19 217:9        | collection 47:14         | 355:18                   |
| 388:20                     | <b>clout</b> 397:1         | 224:8 239:2,13         | 148:1 178:19             | <b>comfort</b> 253:20    |
| clause 193:1               | <b>clue</b> 300:9,9 304:21 | 257:16,19,22           | 185:12 186:5             | 258:20                   |
| <b>clean</b> 78:12 343:5   | <b>Clutter</b> 388:17      | 261:11 263:3,22        | 187:8 191:10             | comfortable              |
| cleaning 324:22            | <b>CMTS</b> 90:3           | 265:20 273:1           | 216:2,5,9 220:21         | 401:11                   |
| cleanup 332:4              | coal 188:8                 | 278:4 364:10           | 240:16,17 375:15         | comfortably              |
| <b>clear</b> 17:6 313:19   | coast 2:4,14 4:10          | coaster 57:7           | 376:8 393:3              | 286:14                   |
| 325:2 327:18               | 4:20 7:6 57:5              | coastline 146:17       | collectively 277:15      | <b>coming</b> 11:15      |
| 334:4 354:17               | 62:3,3 75:19               | 168:2 307:22           | 393:16                   | 30:20 48:19 53:5         |
| clearance 324:21           | 80:10,14 85:16             | 358:17 382:21          | collects 68:3            | 59:9 69:18 74:18         |
| 330:15                     | 92:3 129:13 131:9          | coasts 125:10          | collided 293:19          | 86:20 134:10             |
| clearly 8:5 120:7          | 133:20 138:20              | coattails 306:18       | <b>color</b> 248:11      | 176:8 190:20             |
| <b>clears</b> 112:2        | 151:10 164:10              | 313:5                  | <b>colorful</b> 341:18   | 193:19 195:15            |
| click 239:21 246:2         | 178:17,18 180:4,5          | Cobscook 129:22        | colors 248:21,22         | 205:11 250:22            |
| 246:3,16,20,21             | 180:7 182:4,11             | 130:16 187:15          | Columbia 75:6            | 253:17 260:20            |
| 247:11 249:11              | 184:15,22 188:16           | 188:2                  | 148:18 252:6             | 282:10 284:14            |
| 257:2 264:14               | 190:3 194:18               | <b>coherent</b> 390:10 | 257:5 354:7              | 293:16 294:1,10          |
| clicked 32:4               | 207:21 208:1,3             | cold 248:21 298:21     | <b>column</b> 204:14     | 295:14 296:4             |
| <b>climate</b> 26:21       | 209:2,2 212:3,22           | <b>colder</b> 371:21   | columns 248:18           | 297:19 304:5             |
| 83:17 119:14               | 213:2 225:10               | collaboration          | combatant 385:15         | 305:17 307:12            |
| 262:19 263:4               | 237:13 239:5               | 230:20 328:21          | combination 342:1        | 309:4 321:14             |
| 370:10 398:4               | 242:7 243:3                | collaborative          | 373:9                    | 327:1 333:9 334:3        |
|                            |                            |                        |                          |                          |
|                            | 1                          | 1                      | 1                        | '                        |

| r                     |                           |                         |                                |                          |
|-----------------------|---------------------------|-------------------------|--------------------------------|--------------------------|
| 334:3 336:2,3,11      | 48:11 49:22 55:6          | 29:11 66:21 67:3        | completing 224:1,3             | 336:8                    |
| 336:14 340:8          | 60:2 107:15               | 95:12 113:6 130:9       | 267:3                          | <b>concerns</b> 218:2    |
| 346:18 350:18,19      | 110:21 171:12             | 131:2,14 132:19         | <b>completion</b> 190:16       | 356:6                    |
| 364:15 402:8          | 199:5,15,15               | 173:2 251:6 252:4       | 193:3 220:22                   | <b>concluded</b> 299:20  |
| command 75:21         | 257:18 261:1              | 300:5 347:16            | <b>compliance</b> 166:4        | concrete 92:18           |
| 330:2 386:4           | 286:20 321:10             | 352:20 388:2            | complicated 221:4              | 137:22                   |
| 387:20                | commercial 19:7           | 393:9                   | Complicating                   | <b>condition</b> 24:14   |
| <b>commander</b> 5:18 | 44:13 77:8 80:2           | COMPACFLT 2:8           | 57:14                          | conditions 40:6          |
| 381:8 385:15          | 98:3 128:10,15,19         | 2:21                    | complications                  | 43:20 110:10             |
| 386:3                 | 128:20,21 129:8           | <b>companies</b> 17:2,3 | 55:15                          | 167:3 289:2              |
| <b>comment</b> 5:10   | 140:15 142:22             | 80:5 96:7               |                                | 335:20                   |
|                       |                           |                         | <b>comply</b> 166:12<br>167:16 |                          |
| 12:14 28:16 64:21     | 153:3 160:15              | <b>company</b> 2:3,6    |                                | Conducted 130:6          |
| 91:11 102:7 104:9     | 162:2 169:13              | 4:17,19 76:7 78:5       | <b>complying</b> 166:13        | <b>conductor</b> 161:1   |
| 106:21,22 111:10      | 170:3 194:18              | 133:19 150:17           | <b>component</b> 49:4          | <b>conduit</b> 117:13    |
| 116:10 122:18         | 277:9 278:2,22            | 151:19 290:9            | 102:16 179:2                   | 391:13                   |
| 124:13 126:8,22       | 286:2 344:2               | 325:11                  | 193:6                          | conference 16:10         |
| 140:13 154:9          | 347:13 348:16             | <b>compared</b> 118:6   | components 208:4               | 86:15                    |
| 164:4 169:21          | 351:9                     | 147:8 314:10            | 363:2 366:19                   | confidence 244:20        |
| 171:18 187:7          | commercially              | comparing 247:7         | composite 224:7                | confident 23:1,3         |
| 193:18 200:19         | 44:11 77:9                | comparison 97:15        | comprehensive                  | confirm 197:2            |
| 305:4 310:1 322:3     | Commission                | compatibility           | 370:7 381:13                   | confirmed 204:16         |
| 323:8 327:22          | 273:13 342:20             | 387:20                  | comprehensively                | confirming 188:4         |
| 329:19 331:12         | <b>committee</b> 6:8 8:20 | compatible 388:5        | 367:17                         | <b>confused</b> 161:8,16 |
| 333:19 353:6          | 16:10 17:15 33:4          | compatriots 314:10      | comprised 208:17               | 228:8                    |
| 364:22 376:6          | 49:2 59:20,21             | compensation            | 280:12                         | confusion 318:15         |
| 378:20 386:2          | 76:2 80:8 89:16           | 160:8                   | compromise 53:16               | 318:18                   |
| 387:16 392:6,9        | 90:5,8,10,16              | <b>compete</b> 128:13   | 58:21                          | congratulations          |
| commenting            | 123:3 194:6,8,9           | competing 344:13        | computer 73:11                 | 11:6,9 132:7             |
| 103:15 169:8          | 195:9 298:11              | 344:14                  | computers 255:14               | 298:16                   |
| comments 19:19        | 332:5 355:5,7,8           | competition 374:10      | 255:15                         | Congress 35:20           |
| 20:1,15,17 28:10      | committees 59:5           | 396:2                   | concentrate 280:10             | 43:1 53:8,15             |
| 79:9 88:13 103:16     | 111:17,19 112:5           | competitive 48:17       | concentrating                  | 59:10 60:4 65:3          |
| 104:5 116:13          | committing 277:5          | 49:9 162:14             | 129:7                          | 65:11,14 67:16           |
| 141:10 149:18         | common 227:11             | 365:21                  | concentration 97:5             | 102:2 105:11             |
| 162:17 170:8          | 229:17 230:22             | complain 296:9          | 97:7                           | 107:17 110:22            |
| 172:3 173:8 187:4     | <b>commonly</b> 383:4,8   | complete 13:11          | concentrations                 | 154:3,4 162:21           |
| 199:7 226:9           | Commonwealth              | 130:6 187:7 188:2       | 95:19                          | 265:17 392:18            |
| 269:15 306:19         | 382:6                     | 206:17 221:15           | concept 102:18                 | 394:18,18                |
| 308:8 313:12          | communicate               | 222:16,17 223:16        | 154:8                          | congressional 59:5       |
| 333:16 337:13,17      | 334:10 385:18             | 224:22 283:20           | Conceptually                   | 116:20,21 117:19         |
| 351:19 365:5          | communicating             | completed 189:18        | 103:21                         | 265:13 396:5,11          |
| 367:3 380:21          | 385:6                     | 224:13 238:8            | <b>concern</b> 29:4 61:16      | 396:14,15,22             |
| 381:2,17 383:22       | communications            | 239:16 243:10,11        | 63:20 74:20                    | 397:8,11                 |
| 385:4 389:16,19       | 393:12                    | 243:15 244:2            | 297:17,20 335:1                | Congressionally          |
| 389:22 391:3          | Communities               | 246:6 261:8             | concerned 29:12                | 225:20                   |
| 399:9                 | 91:18                     | 302:20 357:12           | 105:14 279:19                  | congressionals           |
| commerce 1:1          | community 15:1            | 375:2                   | 287:18 294:13                  | 395:10                   |
|                       |                           | 575.2                   | 207.10 27 1.13                 | 575.10                   |
|                       | I                         | 1                       | 1                              | I                        |

| congressman 16:7        | <b>contact</b> 21:5,17  | 202:5 376:14          | 90:10 104:12             | 223:8 232:3,4,20       |
|-------------------------|-------------------------|-----------------------|--------------------------|------------------------|
| 131:18                  | 332:22 369:20           | 380:17                | coordination             | 233:5,7,15 234:9       |
| conjunction 184:14      | contacting 184:2        | contractual 189:12    | 184:13 385:22            | cost 98:11 99:15       |
| 216:11 220:13           | 304:13                  | contrasting 357:8     | 387:14                   | 160:11,17 191:9        |
| 221:18                  | <b>container</b> 280:21 | contribute 91:13      | Coordinator 81:22        | 244:10 255:13          |
| connected 75:2          | 345:4,7 347:8           | 352:11                | 368:4                    | 267:2 308:4            |
| 302:3                   | 350:5                   | contributed 253:15    | сору 92:22 165:12        | 312:16 353:15,18       |
| Connecticut             | containers 341:2        | contribution 98:11    | 187:2 192:16,21          | 357:10 379:20          |
| 245:21 254:4            | 389:11                  | 99:9 367:10           | 263:14,16                | costing 303:2          |
| connecting 209:1        | context 102:5           | control 17:19,22      | coral 14:4 77:12         | <b>costs</b> 161:2,3   |
| 359:21                  | 139:1                   | 18:2 70:8,9 83:18     | 135:13 185:16            | 265:14                 |
| Conrad 82:3             | contiguous 212:8        | 163:20 192:3,11       | 329:11 369:15            | Couast 2:4             |
| consensus 378:6         | continental 382:22      | 196:22 240:12,14      | 370:11 372:3,11          | <b>Council</b> 40:19   |
| Consequently            | contingency 123:20      | 278:10 387:21         | 375:1 379:5 380:5        | 43:11 75:15            |
| 189:3                   | 327:2 355:8             | controlled 342:19     | <b>Coral's</b> 77:3      | 104:14 105:1           |
| <b>consider</b> 39:20   | continually 66:6        | controls 7:19 70:7    | <b>core</b> 222:9 257:18 | counsel 80:8           |
| 56:1 94:10 104:22       | continue 34:13          | controversy 42:20     | 365:16                   | count 114:11,11        |
| 120:4 128:21            | 35:9 36:12 37:17        | 96:5,6 122:22         | corner 171:4 251:1       | 175:13 210:12          |
| 144:5 158:8             | 41:12 115:4             | 200:22                | 254:21 257:4             | counter-current        |
| 159:21 310:22           | 156:19 170:14           | <b>Cont'd</b> 2:25    | corollaries 120:5        | 294:22                 |
| 326:2 374:12            | 181:15 189:3,5          | <b>convene</b> 6:4    | corollary 259:5          | counties 28:2          |
| 381:12                  | 263:11 400:1            | Conventional          | Corporation 76:22        | 154:19 210:8           |
| considerable            | continued 41:11         | 34:19                 | Corps 2:22 3:11          | countries 118:6        |
| 179:22 184:13           | 98:1 134:19             | conversation 92:5     | 69:4,17 70:5,20          | 140:2                  |
| 197:11 204:12           | 188:22 217:5            | 93:14 111:12          | 76:14 79:3 80:22         | country 6:10 11:17     |
| 359:11,19               | continues 26:18         | 143:15 171:16         | 85:7 96:8 178:22         | 15:22 23:7 41:21       |
| considered 164:20       | 198:21                  | 173:22 327:6          | 196:5 228:15             | 42:9 50:12 65:13       |
| considering 63:12       | continuing 30:5         | 362:14                | 237:17 239:1,7           | 65:19 83:7 95:13       |
| <b>Consortium</b> 234:8 | 33:19 61:7 97:22        | conversations         | 243:5 263:19             | 95:19 99:13            |
| <b>constant</b> 21:4,16 | 171:16 181:12           | 92:10 170:14          | 264:4 272:11,17          | 208:15 209:9           |
| constituency 51:13      | continuously 213:6      | 173:14                | 324:20 325:1,3,16        | 212:5 219:17           |
| constituents 390:21     | 219:14                  | <b>convert</b> 240:15 | 327:22 328:4             | <b>County</b> 273:12   |
| Constitution 10:18      | contract 6:12 58:1      | 263:20 360:9          | 329:15 364:1             | <b>couple</b> 7:7 8:19 |
| constitutional          | 76:16 108:20            | 388:1                 | Corpus 27:14 69:1        | 12:6 13:17 19:11       |
| 26:11                   | 189:15 373:19           | converted 195:17      | 82:5 116:12              | 23:6 38:4 49:7         |
| constrained 110:9       | 375:21 376:22           | 239:8                 | <b>correct</b> 69:6,8    | 71:19 89:2 93:12       |
| 353:4 378:17            | 380:10,14,15            | conveyed 91:15        | 106:2,4 150:8            | 95:18 98:13            |
| constraint 392:21       | contracted 96:10        | cooperate 362:7       | 175:19 202:14            | 104:22 105:3           |
| constraints 96:14       | 279:10                  | cooperative 217:20    | 227:6 292:17             | 110:17 115:7           |
| 110:3,5 119:11          | contracting 146:9       | 331:2                 | correctly 155:21         | 127:20 138:16          |
| constructed 82:15       | 343:2 376:11            | coordinate 315:15     | 182:14                   | 141:10 146:10          |
| 120:15                  | 377:6,9,12              | 386:9                 | correctors 238:9         | 153:22 162:17          |
| construction 70:10      | contractor 223:20       | coordinated 180:11    | correlate 140:11         | 170:15 173:20          |
| 253:8 254:3             | contractors 69:10       | 326:9,11 330:11       | correlates 186:22        | 178:5,7 205:16         |
| constructions           | 180:17 376:12,15        | 387:3                 | 360:12                   | 215:22 229:22          |
| 238:5                   | 377:8                   | coordinates 386:3     | <b>CORS</b> 70:4 214:16  | 241:18 264:7           |
| <b>Consultants</b> 74:5 | contracts 66:5          | coordinating 85:19    | 218:6,19 219:13          | 265:8 274:12           |
|                         |                         |                       |                          |                        |
| L                       |                         |                       |                          |                        |

| 337:14 341:8              | 318:15                    | 167:1 235:8,22           | 206:12                         | 206:6,14 210:4               |
|---------------------------|---------------------------|--------------------------|--------------------------------|------------------------------|
| 356:1 361:15              | created 6:8 38:7          | 245:11,19,20,22          | <b>cutting</b> 313:20          | 214:1,4,6,13,21              |
| 365:10 366:11             | 65:2 118:19 152:8         | 246:6 247:18             | <b>cycle</b> 127:2 143:18      | 215:14 216:22                |
| 372:21 373:17             | 194:15 207:20             | 248:7,16 250:8           | <b>cyclone</b> 287:8           | 217:8,12 218:15              |
| 381:2 394:17              | 239:17                    | 251:1 254:6              | C-O-N-T-E-N-T-S                | 219:16 220:10                |
| coupled 256:8             | creates 16:21,22          | 267:21 268:3             | 4:1 5:8                        | 221:7,8 223:13               |
| <b>course</b> 15:7,11     | 17:1 194:22 195:1         | 281:10 283:2             |                                | 224:7,8 227:11,13            |
| 43:17 86:16,21            | 244:9 254:10              | 284:17 285:5             | D                              | 229:16 230:8,17              |
| 110:1 116:22              | 256:10 307:3              | 295:9,12,16              | <b>D</b> 2:16                  | 232:3,4 233:5                |
| 136:15 139:14             | creating 117:8            | 302:18 312:7             | <b>daily</b> 280:1             | 235:2,15 238:9,20            |
| 141:9 175:17              | 154:6                     | 357:10 358:12,15         | <b>Dakota</b> 215:6            | 240:16,16,19                 |
| 179:6,8 182:21            | creation 208:7            | 358:17,21 359:20         | 216:6 231:2                    | 241:17 242:22                |
| 187:20 192:8              | credible 354:13           | 360:1 361:7              | <b>Dakotas</b> 117:16          | 243:16 244:18                |
| 195:3 202:6               | <b>credit</b> 334:18      | 381:13 394:18            | damage 21:21 22:2              | 246:14 248:3,5,6             |
| 206:10 232:17             | Crescent 180:8            | 399:5                    | 22:4 24:21 69:19               | 251:17,18,20                 |
| 249:3,9 274:14            | 181:2                     | currently 36:19          | 134:5 179:21                   | 258:2,4 259:8                |
| 286:19 287:8              | <b>crew</b> 136:11,12,17  | 53:13 60:9 79:22         | 180:6,7 181:6                  | 263:9,9 267:22               |
| 302:15 303:6              | 142:10 338:3              | 89:15 102:20             | 216:10 230:3                   | 269:2,4 270:20               |
| 351:6 366:12              | <b>crews</b> 133:14 142:6 | 149:14 159:16            | 339:16                         | 272:15 273:19                |
| 401:1                     | crippling 58:14           | 182:16 212:2             | damaged 181:18                 | 295:13 314:21                |
| <b>court</b> 8:3 316:4    | <b>crises</b> 66:7,7      | 221:9 223:9              | <b>Dames</b> 253:8             | 315:2 318:14,21              |
| 326:13 381:4,6            | crisp 145:1               | 224:21 280:12            | damn 155:13                    | 320:19 321:9                 |
| <b>courts</b> 82:20       | critical 13:19 16:19      | 376:9                    | <b>DAN</b> 2:22                | 325:16 357:22                |
| <b>cover</b> 178:7 213:21 | 18:22 19:3 49:12          | <b>currents</b> 130:16   | dangerous 130:13               | 360:4,6 364:20               |
| 273:4 280:15              | 108:6,9,13 125:3          | 247:20,22 279:17         | <b>Daniel</b> 2:21 5:17        | 370:8,19 372:17              |
| <b>coverage</b> 381:11,13 | 172:18 189:4              | 283:18 287:11            | 381:7 386:8                    | 376:8 379:2,15,17            |
| <b>covered</b> 37:11      | 286:12 318:13             | 289:21 294:12,17         | dark 154:1 348:3               | 379:22 380:6                 |
| 89:22 271:4               | 343:15 344:5,5            | 297:3,13 303:18          | <b>darn</b> 153:17             | 386:13,18,20                 |
| 381:14                    | 345:17,17 374:12          | 306:19,20 307:20         | <b>dart</b> 317:10             | 387:7,12,14,18               |
| <b>covers</b> 356:13      | 383:20                    | 308:16,21,22             | <b>data</b> 15:13,19           | 388:6,7,13 392:2             |
| co-locate 213:5           | critically 14:10          | 309:7,8,8 357:15         | 26:17 41:17 42:14              | 392:4 393:3                  |
| co-located 272:16         | critters 205:2            | 359:13 366:17            | 45:13 46:14 47:13              | database 210:11              |
| co-managing 371:2         | <b>cross</b> 17:20 308:22 | <b>curve</b> 43:6 256:11 | 47:17,19 48:2                  | data's 187:11                |
| 378:1                     | crossed 16:14             | customer 195:3,4         | 58:6 82:19 84:20               | date 115:18 245:12           |
| <b>CO-OPS</b> 81:9,9,17   | 225:15                    | 236:11,20 237:14         | 118:11 147:4,7,9               | 248:13 254:15                |
| 86:2 147:16 212:4         | crosses 228:18            | 237:15                   | 147:14 148:1,2,7               | 258:3 267:18,18              |
| 213:5 234:19              | <b>crude</b> 97:11        | customers 179:7          | 154:20 158:16<br>178:19 179:1  | 370:7 384:10                 |
| 237:11 263:4              | <b>cruise</b> 101:17      | 195:11,14 197:13         | 185:6,7,12,21                  | dates 126:14                 |
| 267:6 268:2               | 253:12,13,16              | 206:3 237:3 308:5        | 185:6,7,12,21<br>186:4,6 187:8 | datum 220:20                 |
| <b>co-worker</b> 174:9    | 281:7,8 337:18,19         | 384:8,16                 | 188:9,10 190:11                | 222:19 237:19                |
| <b>co-workers</b> 174:5   | <b>cruises</b> 192:2      | <b>cut</b> 34:12 37:18   | 190:14 191:10,16               | 279:14,15                    |
| <b>CR</b> 201:15          | <b>Cruz</b> 180:9 181:5   | 57:8,9 163:16            | 190.14 191.10,10               | datums 212:1                 |
| crane 350:5               | <b>cry</b> 305:16         | 198:3,3 199:4            | 191.17,19 192.4,0              | 229:16,21 239:8              |
| create 84:5 119:20        | <b>CTD-type</b> 204:17    | 266:18,22 295:21         | 192:11,12,13,10                | 263:22<br>Dama 21:0 12 117:5 |
| 169:2 179:4               | <b>cultural</b> 369:18    | 311:7                    | 192.22 193.3                   | <b>Dave</b> 31:9,13 117:5    |
| 194:13 196:9              | <b>curious</b> 26:4 58:19 | <b>cutbacks</b> 391:9    | 202:4,12 204:1                 | 160:7,10 186:20              |
| 203:6 287:11              | <b>current</b> 42:5 54:8  | <b>cuts</b> 34:16 36:13  | 202.7,12 204.1                 | 258:8 266:10                 |
|                           | l                         |                          | l                              | I                            |

|                           |                            |  |  | Page 41:                  |
|---------------------------|----------------------------|--|--|---------------------------|
| <b>David</b> 1:23 2:17    | <b>dealt</b> 194:7         | 379:4  | 51:21 86:1,2                                   | <b>despite</b> 146:22     |
| 3:14 4:5 5:11             | death 343:19               | <b>Deepwater</b> 184:7                         | 176:2 246:16                                   | destroyed 69:22           |
| 9:18,22 11:8              | deaths 132:18              | 203:13 205:5                                   | departing 400:17                               | destroying 241:10         |
| 25:19,20 26:16            | <b>debate</b> 49:1 54:14   | <b>defend</b> 10:18 66:22                      | department 1:1                                 | destructive 247:21        |
| 52:18 53:4,17             | 58:15 62:8 67:22           | 384:22   | 25:5,11,12,15                                  | <b>detail</b> 34:5 57:20  |
| 54:4 58:18 71:11          | 68:18                      | <b>defense</b> 90:11 99:5                      | 48:11 60:2 90:12                               | 81:10 218:22              |
| 71:12 72:1 74:12          | <b>debated</b> 53:20       | 99:8 226:15                                    | 99:5,8 107:15                                  | 263:15 384:7              |
| 102:11 103:11             | 388:3                      | 327:10 382:20                                  | 110:21 226:11,15                               | detailed 214:19           |
| 111:10 115:2              | <b>debates</b> 53:10 96:2  | defensive 383:20                               | 264:17 325:21                                  | details 189:12            |
| 121:4 122:18,21           | <b>debris</b> 315:13,17    | defer 159:22                                   | 354:21 355:17                                  | 207:9 211:20              |
| 126:4,5 146:2             | 323:14,21 324:6            | 198:15   | departure 400:11                               | 231:17 269:3              |
| 157:22 205:20             | 331:13,14,17               | deficiencies 383:7                             | depend 22:11                                   | 359:16 375:2              |
| 271:16 365:5              | 332:1,22 334:3,5           | <b>deficit</b> 168:20                          | dependent 29:15                                | detained 165:19           |
| 369:8                     | 334:15 335:1               | <b>define</b> 208:11                           | 222:3 225:3 296:6                              | detect 181:8 204:18       |
| day 9:3 53:1 88:10        | <b>decade</b> 77:4 281:16  | 209:8  | depending 200:20                               | 284:4                     |
| 160:17 161:3              | 374:20                     | defined 103:8                                  | 242:16 317:21                                  | detection 223:8,15        |
| 168:6 233:11              | decades 75:19              | 209:18   | 377:9  | 226:12 265:1              |
| 251:15 255:5              | 205:17 397:19              |  |  | <b>deteriorate</b> 335:10 |
| 284:19 297:9              | <b>December</b> 130:14     | <b>defining</b> 263:5<br><b>definite</b> 367:9 | depends 396:16                                 | determine 26:14           |
| 311:22 312:1              | 183:14                     |  | <b>depicted</b> 135:11<br><b>deploy</b> 246:12 | 82:16 168:1 204:8         |
| 337:20 346:8              | decent 121:15              | <b>definitely</b> 122:13 206:11 208:6          |  | 213:11 282:22             |
| 367:14 390:3              |                            |  | <b>deployed</b> 180:16                         |                           |
|                           | <b>decide</b> 67:18 74:2   | 295:15 297:3                                   | 181:1 203:21                                   | 284:17,20 286:10          |
| 400:16                    | 114:14 169:5               | 361:17 364:19                                  | 204:5 247:1,10                                 | 362:8 370:12              |
| <b>days</b> 13:17 16:16   | 286:19                     | <b>definition</b> 138:17                       | 248:8,17                                       | determining 221:3         |
| 52:10 57:22 71:17         | <b>decided</b> 108:14,18   | 138:21 285:15                                  | deployment 246:12                              | devastated 20:11          |
| 88:9 133:7 134:10         | 278:5 347:22               | <b>deflect</b> 335:21                          | deployments 247:7                              | devastating 304:10        |
| 142:3,12,13 154:1         | <b>decision</b> 54:13 98:6 | <b>degree</b> 244:8                            | 247:8  | <b>develop</b> 27:5 39:9  |
| 154:6 161:11,13           | 109:10 142:7               | 283:20 335:11                                  | <b>depth</b> 173:19                            | 41:13 44:12 83:15         |
| 163:17,21 170:15          | 196:1 231:15               | 374:4  | 203:21 248:16                                  | 94:13 373:13              |
| 178:5 181:21              | 286:14 312:2               | <b>degrees</b> 295:15                          | 286:5  | <b>developed</b> 15:11    |
| 190:5,7,20,21             | 365:17                     | <b>Delaware</b> 256:18                         | <b>depths</b> 63:21                            | 36:19 38:4 51:2           |
| 215:22 230:18             | <b>decisions</b> 41:18     | <b>delay</b> 7:20 143:21                       | 287:16 360:15                                  | 83:10 261:22              |
| 235:4 249:6 339:6         | 42:15 48:4 134:17          | 202:6 232:10                                   | deputy 5:11 81:18                              | 262:7                     |
| <b>day-to-day</b> 94:20   | 168:15 243:18              | 233:21 250:12                                  | 112:11 369:9                                   | <b>developing</b> 28:8    |
| 172:7,21                  | 260:19                     | <b>delegation</b> 394:1,8                      | describing 200:19                              | 38:5 85:10 120:1          |
| <b>dead</b> 150:2 187:21  | deck 32:11 191:12          | 396:15,16,22                                   | deserved 370:4                                 | development 29:5          |
| 309:10                    | decline 225:10             | 397:9,11 398:2                                 | <b>design</b> 120:15                           | 29:9 41:11,19             |
| <b>deal</b> 27:2,7 43:22  | decommissioned             | delegations 396:11                             | 242:8,16                                       | 49:14 63:4 98:21          |
| 57:18 80:22               | 136:10                     | delighted 11:11                                | designated 6:20                                | 140:18 220:7              |
| 139:11 143:16             | decrease 225:11            | delineation 228:21                             | 80:15 371:15                                   | 238:15 397:22             |
| 144:16 159:19             | decreases 307:17           | deliverables 380:9                             | designed 14:22                                 | 398:7                     |
| 308:12 314:1              | decreasing 190:18          | <b>delivery</b> 190:16,22                      | 242:10 243:4                                   | developmental             |
| 347:19 348:6              | dedicated 287:1            | 261:6  | 369:22   | 220:15                    |
| 354:18 379:22             | deep 278:2 339:13          | <b>deluge</b> 323:14                           | desirability 351:19                            | deviate 129:6             |
| <b>dealing</b> 8:20 164:9 | 339:19 369:15              | demand 389:3                                   | <b>desire</b> 308:10                           | 159:18                    |
| 172:5                     | 372:3                      | Dengue 18:1                                    | 398:18   | deviating 159:15          |
| <b>deals</b> 308:20       | deeper 357:11              | <b>Dentler</b> 2:12 37:1,4                     | desperate 387:6                                | <b>devices</b> 97:20      |
|                           |                            |  |  |                           |
|                           |                            |  |  |                           |

| 152.16 152.1                     | 274.12 402.17                               | diamaring 00.0                         | <b>DI ND</b> 2.10 25.9 15         | 200.10 214.9 12                    |
|----------------------------------|---|--|-----------------------------------|------------------------------------|
| 152:16 153:1<br><b>DFO</b> 80:15 | 274:13 402:17<br><b>Dionne</b> 1:21 28:12   | <b>discussing</b> 88:8<br>203:14 331:1 | <b>DLNR</b> 2:10 25:8,15<br>348:4 | 309:19 314:8,12<br>332:11 334:11   |
| <b>DHS</b> 139:11 223:6          |   | discussion 5:22                        | <b>DNC</b> 195:22                 |                                    |
|                                  | 28:12 83:4,5                                |  |                                   | 345:9,22 346:20                    |
| 226:17                           | 124:15,15 153:11                            | 37:17 49:1 54:18                       | 387:16                            | 359:22 375:5                       |
| <b>dialogue</b> 173:14           | 167:18 168:18                               | 63:17 87:13 88:5                       | <b>DNCs</b> 194:15                | 379:6 388:21                       |
| 288:17 289:11                    | 169:4 192:15                                | 88:11 95:10 96:1                       | <b>DoC</b> 199:4                  | 391:11 394:2                       |
| 362:13                           | 350:7 361:22                                | 115:5 116:8 139:3                      | <b>dock</b> 166:14 350:2          | 395:3                              |
| <b>diameter</b> 242:14           | 363:5 390:6 402:7<br><b>dipped</b> 392:7,10 | 141:16 142:1                           | <b>document</b> 92:2              | <b>dollar</b> 16:11 118:5<br>169:2 |
| <b>die</b> 123:17 150:3          | dipped 392:7,10<br>direct 26:4 192:9        | 172:2 174:6 185:4                      | 107:7,14,20                       |                                    |
| 382:3                            |   | 196:3 302:19                           | 109:16,20 110:15                  | <b>dollars</b> 39:3 50:5           |
| <b>diesel</b> 343:6              | directed 189:4                              | 329:4 333:13                           | 110:16 111:8                      | 71:1 118:14                        |
| <b>difference</b> 99:17,18       | 321:21 322:2                                | 367:4 389:18                           | 145:13 166:18                     | 133:21,22 168:8                    |
| 137:19                           | direction 48:1                              | <b>discussions</b> 329:12              | 167:5 172:18                      | 169:7 267:7 297:2                  |
| differences 213:15               | 282:21 284:19                               | 353:11,13 379:10                       | 174:14 199:22                     | dollar-wise 50:11                  |
| <b>different</b> 7:17            | 324:4 361:11                                | disestablish 320:17                    | 264:4,5,9,11,13                   | <b>domain</b> 217:1                |
| 59:10,11 77:11                   | <b>directions</b> 146:10                    | disestablished                         | 295:8 384:18                      | <b>domestic</b> 10:20              |
| 109:20 110:11                    | 174:21 380:19                               | 320:4,18                               | 385:1                             | 264:16 297:6                       |
| 120:3 139:4                      | <b>directly</b> 36:8 58:3                   | disheartening                          | documentation                     | domestically 263:7                 |
| 146:10 165:11                    | 63:10,12 78:9                               | 136:1                                  | 384:7                             | <b>dominating</b> 111:12           |
| 194:4,17,21                      | 235:21 245:9                                | disinclined 22:7                       | <b>documents</b> 146:11           | <b>Domino</b> 133:18               |
| 195:13,14 197:18                 | 260:2 316:19                                | <b>dispel</b> 141:3                    | <b>DoD</b> 194:14 196:1           | 134:7<br>D 204 21                  |
| 200:17 212:5                     | 325:18 385:19                               | displaced 330:7                        | 198:2 228:4                       | <b>Don</b> 394:21                  |
| 229:11 231:11                    | director 2:9,13,18                          | <b>displays</b> 260:10                 | <b>Dog</b> 140:17                 | <b>door</b> 58:5 61:17             |
| 232:10 236:9                     | 7:6 16:6 25:6                               | disposal 220:17                        | <b>dogs</b> 340:17                | 202:5 363:19                       |
| 238:1 247:3                      | 80:13,19 81:4,18                            | 279:5                                  | <b>doing</b> 16:20 19:9           | dots 246:22                        |
| 248:19 250:4                     | 81:19 82:3 206:22                           | disseminating                          | 19:10 25:10 27:4                  | <b>double</b> 241:5 311:2          |
| 251:5 262:18                     | disappeared                                 | 210:4                                  | 29:22 35:18 45:16                 | 344:9                              |
| 273:17,17 276:3                  | 191:19                                      | dissemination                          | 47:6,12 76:10                     | doubt 131:8                        |
| 278:3 363:1                      | disarray 366:1                              | 273:18                                 | 77:5 81:16 98:17                  | <b>Doug</b> 313:14                 |
| 365:14 366:14                    | disaster 184:8,17                           | <b>distant</b> 121:10                  | 100:9 113:15                      | <b>Douglas</b> 2:4 4:19            |
| 374:2 378:1 379:1                | disasters 215:10                            | 163:5 177:14                           | 114:21 125:7                      | downloading                        |
| 387:19 388:11                    | discharge 11:2                              | distantly 76:3                         | 126:3 137:10                      | 246:14                             |
| 390:7                            | discharging 345:3                           | distribute 132:3                       | 140:11 149:12                     | downstairs 402:12                  |
| differently 121:2                | 345:6                                       | 193:15                                 | 150:13 157:14                     | <b>downturn</b> 22:10              |
| 229:13                           | disclosure 75:18                            | distributed 93:2                       | 158:7 172:22                      | <b>Dr</b> 40:17 79:9               |
| difficult 58:13                  | discrepancies                               | <b>District</b> 2:4 4:20               | 180:22 181:13                     | 86:17 105:10                       |
| 130:18 149:3,4                   | 318:9 320:12                                | 217:22 328:8                           | 185:10 192:7                      | 106:1,4 111:16                     |
| 182:18 183:2                     | discrepancy 320:20                          | <b>districts</b> 117:1,2               | 196:18 223:15                     | 112:1,8,13 113:5                   |
| 304:19 346:4                     | <b>discretion</b> 327:14                    | diver 184:22                           | 227:16,16 228:17                  | 115:9,10,13 126:9                  |
| <b>digital</b> 194:17            | <b>discuss</b> 61:8 288:19                  | <b>divers</b> 187:20                   | 232:18 233:4                      | 129:5 204:10                       |
| digitized 281:21                 | 300:1                                       | 244:10                                 | 236:8 237:6 240:5                 | 329:3 359:14,15                    |
| dignitaries 11:19                | discussed 125:21                            | <b>diverse</b> 8:13 12:4               | 240:11 241:9                      | <b>draconian</b> 33:21             |
| <b>dilemma</b> 157:13            | 166:18 174:20                               | 257:20                                 | 243:6 251:16                      | draft 186:21 278:2                 |
| dimensional 70:14                | 180:3 198:10                                | diving 188:3                           | 262:12 268:12                     | 339:13,19                          |
| diminish 400:4                   | 199:2 210:22                                | <b>division</b> 2:14 81:15             | 269:9 272:2,9                     | dragging 131:5,11                  |
| diminished 97:6                  | 283:8 284:22                                | 355:18                                 | 284:5,21 285:18                   | <b>dramatic</b> 34:16              |
| dinner 175:11,18                 | 285:10,16                                   | divisions 354:22                       | 302:21 304:20                     | 134:11                             |
|                                  |   |  | l                                 | l                                  |

| dramatically 57:4         | 169:22 186:20            | 23:4 29:14 32:7      | 370:9                    | 166:21 167:14        |
|---------------------------|--------------------------|----------------------|--------------------------|----------------------|
| 307:19,21                 | 199:2 217:11             | 35:15 50:4,5         | efficiencies 220:9       | 169:12,18 202:13     |
| <b>draw</b> 342:2 399:2   | 222:10 223:2             | 114:12 117:7         | 267:1                    | 202:20 282:1         |
| drawer 191:20             | 242:10 250:14            | 152:15 168:8         | efficiency 16:22         | 289:16 315:2         |
| <b>drawn</b> 51:10        | 308:11 321:2             | 171:8 219:10         | 71:5 144:7,16            | 318:7                |
| <b>dredge</b> 63:21       | 360:21 395:14            | ecosystem 38:14      | 170:21 194:9             | elements 76:4        |
| dredging 63:19            | <b>earliest</b> 248:12   | 85:2 112:12          | 266:18                   | 394:9                |
| 64:14,15 65:11,18         | early 14:4 96:2          | 261:12 370:15,17     | efficient 68:13          | elevate 400:3        |
| 65:22 66:5,7 69:5         | 115:14 134:3             | Ed 6:7 7:2 8:9,11    | 70:16 141:22             | elevated 245:4       |
| 70:7,11,14,16,18          | 284:14 291:8             | 13:4 52:13 64:21     | 278:1                    | elevation 209:6      |
| 70:21 75:3 79:10          | 297:21 400:11            | 79:19 88:19 94:6     | efficiently 48:21        | 211:1 214:15         |
| 237:18                    | earmark 56:4             | 102:1 105:22         | 64:16 222:1              | elevations 221:3     |
| <b>drill</b> 384:2        | 260:13 265:21            | 116:17 119:5         | 386:15                   | elevator 234:22      |
| <b>drive</b> 340:22       | 266:5                    | 132:14 171:19        | <b>effort</b> 46:6 97:12 | eliminate 139:12     |
| 358:14                    | earmarks 55:16,19        | 177:21,22 207:3      | 98:9 107:9 130:2         | 139:22               |
| <b>driven</b> 40:20 83:16 | 55:21 225:20             | 234:20 369:3         | 130:5 138:3 184:1        | email 164:5 165:11   |
| 242:17 366:6,15           | 395:11                   | 377:16               | 188:12,18 189:9          | embark 372:18        |
| driver 41:22              | <b>earth</b> 207:14      | edge 382:22          | 192:20 195:8             | embarrassed 114:6    |
| drivers 36:7              | earthquake 179:19        | edged 311:2          | 199:3 202:11             | <b>embrace</b> 28:17 |
| <b>drop</b> 22:14,15      | 258:11 326:20            | edges 55:17          | 208:5 212:3,4            | embraced 98:4        |
| 23:18 356:11              | easily 111:6 122:7       | <b>EDIQ</b> 376:22   | 217:7,7,15,20            | 153:16               |
| dropped 266:7             | 204:8 216:2 342:7        | edition 250:9        | 223:5 230:13,17          | emergency 7:10       |
| dropping 345:7            | east 129:22 133:20       | Edmund 1:17,19       | 231:10 240:9             | 21:4 215:4,8,20      |
| <b>dry</b> 207:15 346:8   | 164:10 182:11            | <b>educate</b> 283:1 | 243:15 255:11            | 223:4,5 231:10       |
| <b>duck</b> 152:5         | 289:8 295:5              | 310:8 397:13         | 272:2 277:6              | 259:9 330:12         |
| <b>due</b> 58:15 202:5    | 297:18 376:21            | educated 29:12       | 309:18 370:21            | 355:13               |
| 326:19                    | easy 118:1 319:8         | 311:4                | 383:20 386:6             | emergent 372:2       |
| duplication 194:11        | 331:15 341:1             | education 91:11      | 397:17                   | emotional 129:2      |
| 195:8,11,12 196:3         | ECDIS 164:22             | 170:22 310:20        | efforts 99:4 115:22      | 132:17 135:8         |
| 197:11,12,13,14           | 281:20 283:3             | 394:9 398:10         | 191:12 208:14            | emphasis 106:8       |
| 199:3,5 386:6             | 284:3 289:16             | Edward 2:11 368:7    | 212:20 215:13            | emphasized 146:11    |
| 387:16                    | 291:9                    | Edwing 2:13 4:12     | 223:4 227:13             | emphatic 129:2       |
| <b>DUPUIS</b> 2:12        | <b>echo</b> 144:20 321:1 | 81:3,4 234:17,20     | 262:20                   | employed 78:21       |
| <b>dust</b> 346:12        | <b>echoes</b> 144:9      | 246:18 252:10,13     | eight 53:21 77:17        | employees 12:17      |
| duties 11:2               | ecologist 83:5           | 252:17,19 266:21     | 314:9 319:5              | 14:13 132:9 278:8    |
| <b>dwindle</b> 384:15     | 84:10                    | 270:1,8 271:22       | either 22:6 95:13        | employer 14:12       |
| dying 128:22              | economic 15:4            | 272:5 273:9,12,16    | 108:15 140:7             | <b>en</b> 150:10     |
| <b>D-14</b> 317:3 319:22  | 16:17 17:4 20:18         | 353:7,10 357:13      | 150:22 189:10            | enable 188:17        |
| <b>D.C</b> 79:21          | 22:9,22 35:8             | 357:18 358:13,20     | 191:7 283:7              | 214:5 221:22         |
| E                         | 50:19 102:15,16          | 359:3,7              | 284:19 305:9             | 380:17               |
|                           | 102:18 218:14            | <b>EEZ</b> 101:3     | 330:8 345:12             | enabled 152:15       |
| <b>e</b> 1:24 2:18 4:10   | 252:5 354:6,8,14         | effect 210:17 283:5  | 352:2 375:17             | 210:8,19             |
| 13:7                      | economics 18:14          | 302:8 307:3          | 376:13 377:13            | enabling 263:21      |
| eager 91:11               | 103:1                    | effecting 137:17     | electoral 117:1          | enacted 153:22       |
| ear 126:2                 | Economies 91:18          | effective 129:3      | electric 281:20          | ENC 179:5 194:18     |
| earlier 16:2 91:7         | economists 167:22        | 397:3                | 343:12                   | 195:15,18,22         |
| 107:1 126:22              | economy 16:22            | effectively 48:22    | electronic 166:11        | 267:18,20 318:19     |
|                           | l                        |                      | l                        |                      |

| 387:17 388:1               | 15:4 95:12             | 185:19 243:6            | 286:11 287:8              | 387:13 389:4        |
|----------------------------|------------------------|-------------------------|---------------------------|---------------------|
| encompasses                | entangled 337:6        | 322:21 325:2,4          | 324:17 326:19             | 396:18              |
| 219:11                     | <b>enter</b> 11:3      | 327:8 328:10            | 330:14                    | examples 32:5       |
| encourage 92:8             | <b>entering</b> 338:16 | 355:12                  | events 370:13             | 41:20 45:12 90:20   |
| 169:5 321:21               | <b>enters</b> 337:20   | equivalence 202:21      | 389:21                    | 137:22 138:5        |
| 379:16                     | enthusiastically       | <b>era</b> 109:16 394:5 | eventually 81:15          | 191:3               |
| <b>ENCs</b> 164:22         | 130:22                 | eradication 18:1        | 96:21 182:15              | exceed 159:14       |
| 194:20 201:21              | <b>entice</b> 32:21    | erosion 186:15          | 183:18 397:6              | excellent 49:21     |
| 202:7,8 203:6              | entire 141:15 188:2    | error 21:10 232:11      | everybody 7:3,4           | 126:12 132:7        |
| 318:9                      | 205:12                 | 232:16                  | 8:18 9:4 41:13            | 172:3 387:13        |
| endangered 313:22          | entities 43:1 199:15   | especially 18:5,6       | 47:20 65:1 110:4          | exception 178:21    |
| ended 35:4 81:13           | 217:18 227:10          | 21:14 62:7 84:2         | 116:3 160:21              | 224:1 315:1 382:5   |
| 290:18 303:21              | 228:16 251:12          | 130:8 282:11            | 175:22 183:22             | Exchange 282:7      |
| <b>ends</b> 75:22          | entity 129:12 231:6    | 306:21 307:21           | 195:4 201:6               | excited 248:4       |
| <b>enemies</b> 10:19       | 278:7                  | 310:10 355:3            | 229:19 266:14,18          | exciting 145:19     |
| <b>energy</b> 42:1,8       | <b>entry</b> 284:1     | essence 41:5 42:22      | 266:21 273:19             | 197:5 357:3         |
| 251:7,10 273:2             | <b>envelop</b> 160:4   | essentially 106:3       | 274:16 288:10             | exclusionary        |
| <b>Enforcement</b> 273:3   | 182:14                 | 157:9 345:18            | 322:4 352:8               | 102:22              |
| <b>engage</b> 88:6 90:4    | environment 13:12      | establish 114:20        | 367:18,22 368:11          | <b>excuse</b> 30:22 |
| 92:19 96:8                 | 13:14 14:15 15:2       | 213:18 217:8            | 402:11 403:5              | 297:11              |
| engaged 32:21              | 16:18 32:17 33:10      | 218:6 222:15            | everybody's 7:11          | executing 330:16    |
| 48:13 98:14                | 33:15 78:16            | 254:18 264:20           | 75:4 273:20               | exercise 122:6      |
| 137:20 379:1               | 128:13 178:4           | 265:3 268:15            | 286:21                    | 184:20              |
| <b>engine</b> 281:14       | 180:10 188:21          | 352:7                   | everyday 338:17           | exhaustive 95:6     |
| engineer 7:18              | 252:21 261:21          | established 254:15      | everything's 109:2        | 100:4               |
| engineering 2:18           | 268:14 299:13          | 287:21                  | 142:4 283:13              | Exhibit 51:3        |
| 82:9                       | 356:19 378:17          | establishing 353:3      | evident 288:13            | exist 44:17,17 68:1 |
| <b>engineers</b> 2:22 3:11 | environmental          | estimate 24:21          | <b>evolution</b> 281:17   | 369:19 370:21       |
| 69:4,17 76:7,15            | 14:22 15:5 28:22       | 201:10 353:19           | evolving 281:10           | 396:14              |
| 178:22 228:15              | 43:20 78:15 84:9       | estimated 219:16        | 283:2                     | existence 65:6      |
| 243:5 263:19               | 90:12 101:9,11         | 219:21,22               | exact 230:19              | 77:17 154:21,21     |
| 324:20 325:1,4,17          | 102:12,15 103:7,8      | estimates 375:6         | 233:21 359:16             | 159:5 384:12        |
| 327:22 328:4               | 104:15 105:1,17        | estuaries 126:12        | exactly 16:2 17:6         | existing 238:16     |
| 364:1                      | 112:12 199:16          | 255:10 257:11           | 20:22 59:12 64:9          | 271:13 376:12,15    |
| England 212:9              | 212:18 252:1           | Estuarine 28:13         | 67:5 70:19 202:15         | 391:6               |
| 363:2                      | 255:17 356:5           | 83:6 262:13             | 215:17 232:20             | exists 195:12       |
| Englander 315:22           | environmentalists      | et 106:17 160:10        | 395:2                     | <b>exits</b> 7:11   |
| enhanced 307:7             | 29:4                   | 196:5 376:14            | <b>example</b> 15:2 17:14 | expand 49:21 63:7   |
| enhancements               | environmentally        | ETA 297:12              | 42:17 64:4 68:2           | 191:8               |
| 277:2                      | 44:9 299:15            | Europeans 147:8         | 98:12 149:6 152:6         | expanded 51:2       |
| enhances 307:15            | environments           | evacuation 259:3        | 153:7 172:10              | 67:14 97:5 111:3    |
| enjoyment 13:12            | 181:7                  | 260:19                  | 173:11 184:19             | 236:3               |
| 13:13                      | episode 215:11         | evaluation 244:2        | 185:13 186:2              | expanding 63:9      |
| ensure 15:18 98:7          | equal 277:7            | evasion 11:1            | 198:17 283:3              | 261:19              |
| 185:19 286:4               | equally 13:14          | event 20:19 158:5       | 318:17 319:5              | expansion 49:5,11   |
| 287:15                     | equipment 64:12        | 183:13 184:7            | 342:12 343:22             | 49:13 84:8 211:18   |
| ensuring 13:20             | 64:12 70:10 72:20      | 234:5 241:17            | 349:19 386:15             | 383:13              |
|                            |                        |                         |                           |                     |
|                            |                        |                         |                           |                     |

| expect 133:13,17      | ovtonsive 00.14             | 189:1 269:20               | features 250:6             | fight 66.12 201.1         |
|-----------------------|-----------------------------|----------------------------|----------------------------|---------------------------|
| <b>–</b> '            | extensive 99:14             |                            | 351:21                     | <b>fight</b> 66:13 384:4  |
| 134:6,15 190:11       | 173:14 351:1                | <b>Fairbanks</b> 75:13     |                            | <b>fighting</b> 67:12     |
| 283:21 284:8          | <b>extensively</b> 280:15   | <b>fairly</b> 42:22 70:14  | <b>February</b> 130:15     | <b>figure</b> 151:9 157:6 |
| 295:11                | <b>extent</b> 20:19 68:10   | 75:15 111:2 118:1          | <b>federal</b> 6:20 43:2   | 305:9 332:16              |
| expectation 205:3     | 106:10 123:22               | 196:22 232:2               | 52:22 53:2 68:20           | <b>figured</b> 59:15      |
| expected 187:9        | 289:22                      | 283:13,15 284:15           | 80:15 90:11 95:20          | <b>figures</b> 168:5      |
| 206:9 215:17          | extra 19:11                 | 288:13 387:2               | 96:9,14 98:16              | 230:19                    |
| expend 159:11         | extreme 241:17              | 400:11                     | 99:15 132:8                | figuring 304:21           |
| expended 154:6        | 343:17                      | fairways 206:8             | 144:17,18 145:22           | fill 275:22 276:4,8       |
| expenditure 149:15    | extremely 33:16             | <b>faith</b> 10:20         | 152:5,8 162:13             | 279:7                     |
| 354:15                | 40:4 41:9 51:17             | faithfully 11:2            | 180:11 184:14              | filters 237:7             |
| expenses 384:20       | 58:13 111:17                | fall 36:14 245:9           | 219:3 229:8,11,14          | <b>final</b> 31:9 34:4    |
| expensive 285:4       | 121:12 132:17               | 280:17 364:15              | 231:11 237:16              | 38:20 55:12 91:14         |
| 296:12                | 378:17                      | 385:17                     | 320:13 353:2,4             | 92:16 187:6               |
| experience 47:21      | ex-astronaut 113:6          | falls 78:17 218:12         | 368:21                     | 223:19 254:13             |
| 81:1 94:4,4           | <b>eye</b> 172:22           | <b>familiar</b> 65:1 153:6 | <b>fee</b> 151:22 152:1,2  | 264:9,13                  |
| 103:20 143:6,11       | <b>eyes</b> 137:16          | 194:20 279:3               | 152:22 165:15,16           | finalize 193:5            |
| 281:6 288:16          | F                           | 362:17 371:12              | 165:17                     | 264:13                    |
| 372:15 397:2          |                             | family 20:5                | feed 223:14 267:11         | finalized 37:14           |
| experienced 76:10     | FAA 220:13                  | <b>fans</b> 134:7          | 267:16 268:1               | 109:9                     |
| experiences 10:8      | FACA 9:15                   | fantastic 52:4             | feedback 133:12            | finalizing 23:12          |
| 10:10 353:21          | <b>FACAs</b> 94:5           | 172:2                      | 264:7                      | finally 33:19 50:14       |
| 354:4                 | face 35:8                   | far 99:17 103:20           | <b>feeds</b> 268:2         | 51:15 77:16               |
| experiencing 344:7    | facets 122:5                | 107:10 128:7               | <b>feel</b> 23:1,2 46:16   | 252:22                    |
| expertise 19:15       | <b>facilitate</b> 8:1 79:16 | 143:17 173:22              | 146:4 197:12               | finance 28:5              |
| 41:16 88:1 108:19     | 321:5                       | 177:14 190:10              | 333:12 367:7               | 354:17                    |
| 130:19 185:9          | facilitated 139:2           | 231:14 239:15              | 380:19                     | financial 98:11           |
| 265:5,6               | facilitating 103:2          | 246:19 260:21,22           | feeling 23:9 100:9         | 151:8                     |
| experts 204:6         | facilitation 101:10         | 269:22 284:11              | fees 149:22 151:21         | <b>find</b> 16:11 17:16   |
| explain 142:21        | <b>facilities</b> 21:22     | 315:5 326:4 361:8          | 173:12                     | 79:8 105:14               |
| 163:22 195:10         | 66:10 327:5 396:7           | 397:22                     | <b>feet</b> 130:17,17      | 113:14 115:18,18          |
| 197:15 229:8          | <b>facility</b> 20:8,10     | farmers 154:19             | 242:17,18 289:10           | 220:8 252:20              |
| 377:17                | facing 4:8 117:9            | farming 70:10              | 307:2,3,6 344:11           | 266:22 303:5,16           |
| explanations 114:7    | fact 37:12 39:18            | farms 42:3,9               | 344:13 348:14              | 304:4 305:9 311:3         |
| exploration 42:13     | 40:16 44:11 55:15           | far-reaching 14:2          | 349:5                      | 323:16 335:13             |
| 44:4 98:21 308:9      | 118:4 153:21                | fashion 157:20             | <b>fell</b> 348:13         | 388:13 399:22             |
| <b>explore</b> 372:10 | 156:20 159:22               | fast 123:17 315:22         | <b>felt</b> 21:13,15 107:5 | <b>finding</b> 347:1      |
| export 48:10,13       | 195:21 208:19               | 380:1                      | 188:21 284:7               | <b>fine</b> 31:6 164:13   |
| 90:19,22 118:4        | 229:3 271:8 299:7           | <b>faster</b> 256:4        | 286:22 289:6               | 165:17 166:3,15           |
| exports 117:13,17     | 303:22 331:8                | fat 25:15                  | FEMA 21:5 22:1             | 326:11                    |
| 117:21 118:7,9,14     | 335:3 373:17                | fathom 229:1               | 24:18,20 231:3,16          | fined 165:13 166:1        |
| 118:16                | 382:17                      | fault 163:10               | 254:13                     | <b>fines</b> 165:5,6      |
| export/import         | factors 58:10               | favor 118:15               | FEMA's 22:4,7              | 167:15                    |
| 48:20                 | factual 17:12               | favorable 34:22            | Fernandina 251:3           | fingers 225:14            |
| expressed 353:12      | <b>failure</b> 270:18       | 36:9 295:16                | fever 18:1                 | <b>finish</b> 31:12 88:17 |
| extended 382:22       | fair 35:18 38:14            | feasible 151:14            | <b>Fifteen</b> 116:2       | 220:5                     |
| Extension 14:18       | 42:19 43:5 46:7             | <b>feature</b> 295:9       | <b>fifth</b> 91:14         | finished 216:4            |
|                       |                             |                            |                            |                           |

|                             | 1                        |                         | 1                    | 1                        |
|-----------------------------|--------------------------|-------------------------|----------------------|--------------------------|
| 230:8                       | 69:12 162:22             | 132:20 144:6            | foolish 167:13       | 375:3 387:14             |
| finite 168:16               | 211:2 228:13             | 156:6 173:18            | foot 242:14 289:19   | 395:18 396:2,7           |
| first 6:13,18 7:10          | five 89:19 93:7          | 174:20 201:7            | 345:6                | forthcoming              |
| 8:9,17 11:12                | 142:2 195:18             | 217:15 221:6            | forces 383:12        | 104:21                   |
| 31:21 52:17 67:7            | 230:18 233:8,12          | 225:22 314:15           | forcibly 87:12       | forum 299:5 331:5        |
| 68:13,15 74:10              | 233:20 245:3             | focused 124:20          | forecast 245:17      | forward 32:10            |
| 77:6 79:2 80:21             | 263:13 268:20            | 170:16 196:7            | 255:9 260:3          | 35:17 38:10,20           |
| 81:8 82:7 90:1              | 293:17 294:4             | 197:10 198:16           | 261:17,22 301:22     | 46:19 52:9 88:1          |
| 91:21 106:7 107:3           | 348:13 372:2             | 257:17 264:16           | 357:22               | 94:14 145:17             |
| 107:12 116:9                | 381:21 397:19            | 379:11                  | forecasting 233:14   | 325:22 374:15            |
| 176:7 177:11,15             | fix 250:19 270:19        | focusing 212:19         | 359:3                | fought 170:3             |
| 177:17 178:6                | 348:19                   | 228:5                   | forecasts 215:14     | <b>found</b> 133:11      |
| 213:22 246:20,22            | fixed 26:12 348:21       | fog 252:12              | 243:20 258:14        | 135:11 187:15,17         |
| 256:15,20 257:16            | fixing 250:20            | fold 262:9              | foreign 10:19 80:4   | 187:22 289:17            |
| 266:6 274:13                | <b>flag</b> 338:1        | folks 6:9 12:7 15:7     | 140:2 150:14         | 304:1 345:3              |
| 276:16,18 277:7             | flagged 294:6            | 49:7 62:12 63:18        | 165:21 278:21        | foundation 78:11         |
| 293:9 298:12                | fleet 5:19 139:20        | 63:22 67:3 68:9         | 280:22 294:5         | 122:11 262:21            |
| 314:3,15 318:6              | 140:9 143:19             | 109:11,14 132:6,6       | 389:5                | foundational 217:8       |
| 326:7 344:8,15              | 144:7,17,18,19           | 134:22 173:1            | foreign-crewed       | 222:9 228:14             |
| 400:10 402:5                | 145:22 170:19            | 176:14,17 177:16        | 294:6                | 257:18                   |
| <b>fiscal</b> 53:4,10,12,13 | 258:22 317:1             | 200:19 215:2            | foreign-flagged      | founded 298:9            |
| 53:18 54:8,8                | 330:4 341:4 381:9        | 228:17 247:17           | 338:10,13            | 363:10 365:16            |
| 221:14 224:2                | <b>flesh</b> 45:15       | 261:13 276:2            | foreseeable 202:20   | four 8:21 11:16          |
| 225:1 269:10                | <b>flex</b> 63:20        | 279:4 285:2,21          | foresight 136:15     | 91:19 142:2              |
| 373:20 375:12               | <b>flinch</b> 122:20     | 288:17,20 290:3         | forethought 136:14   | 213:21 242:5,14          |
| <b>fish</b> 2:22 84:10      | <b>float</b> 155:12      | 300:13 302:18           | forever 397:12       | 242:19 245:3             |
| 128:13 199:9,12             | <b>floating</b> 201:11   | 305:13 306:13           | forget 272:12        | 247:3 278:3              |
| 302:15 372:11               | 304:12 324:6             | 308:6,12 309:11         | forgot 31:1 111:14   | 312:20 348:12            |
| 376:2 378:2,15              | 335:9                    | 310:9,21 311:9,14       | 116:15               | <b>fourth</b> 91:6 252:6 |
| 397:19 398:1,11             | <b>flood</b> 125:2       | 326:18 332:14,22        | <b>fork</b> 99:2     | 349:16,17                |
| <b>fisheries</b> 14:5 141:8 | <b>flooding</b> 215:6,11 | 345:10 347:17           | form 93:22 204:19    | frame 89:4 192:5         |
| 199:11,12                   | 231:2 261:1              | 351:11,16 352:15        | formal 250:20        | 218:20 241:22            |
| <b>fishermen</b> 128:9,10   | <b>floor</b> 13:2 98:14  | 354:4 359:12            | formalize 374:15     | <b>frames</b> 245:4      |
| 129:10 131:4                | 277:19                   | 363:17 367:19           | formally 91:17       | framework 94:9           |
| <b>fishes</b> 84:13         | <b>Florida</b> 135:10    | 374:11 376:20           | <b>format</b> 37:22  | 122:13 207:16            |
| <b>fishing</b> 42:12        | 166:8 251:2,3            | 393:13 403:6            | 194:18 202:13        | 208:14 224:7             |
| 128:15,20 130:8             | 253:3 261:18             | <b>follow</b> 10:2      | 387:19 388:1,6       | 228:12,19 235:16         |
| 131:13 140:18               | <b>flow</b> 83:22 254:10 | following 37:21         | former 25:6 84:14    | 235:17                   |
| 153:10,12,22                | 295:12                   | 57:12 64:1 105:20       | <b>forms</b> 276:7   | <b>Fran</b> 180:22       |
| 181:14,15 187:18            | <b>flown</b> 156:15      | 124:17 312:6            | formulate 39:3       | Francisco 180:22         |
| 188:12 280:22               | 221:12                   | 316:4 389:6             | formulating 38:18    | 251:2 252:15             |
| 301:19 391:21               | <b>flows</b> 154:2       | <b>follows</b> 236:18   | formulation 38:9     | 282:7                    |
| fit 32:19,20 113:15         | <b>fluke</b> 39:16       | <b>follow-on</b> 393:21 | <b>forth</b> 55:1,11 | frankly 29:13            |
| 114:1,8 138:22              | <b>fly</b> 250:1 330:5,7 | follow-up 23:22         | 105:17,22 143:4      | 109:9 128:11             |
| 166:17 167:3                | <b>flying</b> 230:10     | 28:15 105:7             | 253:22 288:14        | <b>free</b> 25:17 150:13 |
| 229:18                      | focus 84:22 90:3         | food 118:11 176:17      | 329:13 337:3,6       | 150:16,18 154:17         |
| <b>fits</b> 40:15 47:11,14  | 105:19 120:17            | <b>food's</b> 274:15    | 348:18 359:21        | 154:20 311:5             |
|                             | l                        |                         |                      | l                        |

| 333:12 367:7               | 107:18 235:9              | gained 80:22               | generally 180:9,12        | 194:14 212:16             |
|----------------------------|---------------------------|----------------------------|---------------------------|---------------------------|
| 392:19 393:6               | <b>funded</b> 26:9,15     | Galveston 71:4             | 187:18 388:21             | 229:16 268:21             |
| <b>freely</b> 10:22        | 98:7 134:18               | game 113:21 157:9          | <b>generate</b> 50:8 52:7 | 381:8 383:19              |
| frequent 205:12            | 201:21 329:10             | gangways 401:22            | 153:1                     | 385:9,12                  |
| 281:2                      | 382:18                    | <b>gap</b> 64:13 253:2,5   | generated 50:6            | geospatial-based          |
| frequently 158:3           | <b>funding</b> 53:5 69:2  | 253:12,19 272:9            | 117:22 179:20             | 152:22                    |
| 278:20                     | 69:18 71:6,7              | gaps 45:14 268:21          | 219:22                    | <b>Gerd</b> 2:13 4:8 85:7 |
| <b>fresh</b> 200:21 230:7  | 77:11,12 96:14            | 372:16                     | generates 50:7            | 88:12,20 90:8             |
| <b>Friday</b> 92:15 329:3  | 98:1,16,17 99:15          | Garmin 169:14              | generating 200:9          | 92:21 94:15               |
| <b>friend</b> 174:9 175:5  | 106:9 109:1               | Gary 1:23 27:11,13         | 258:13                    | 102:10 119:4,6            |
| 391:5                      | 147:18,19 152:9           | 68:21,22 82:1              | generation 42:4           | 143:7,9 170:7             |
| <b>friends</b> 18:18       | 153:4 193:2 254:5         | 116:9,11 118:22            | 89:8 195:15,17            | germane 293:7             |
| 392:11                     | 254:20 261:18             | 160:5 166:17               | 244:4                     | getting 20:7 22:1         |
| <b>front</b> 10:15 29:6,10 | 265:14,18 266:4           | 171:7,22 203:10            | gentleman 128:6           | 24:18 26:22 35:4          |
| <b>fronts</b> 40:16        | 303:2 354:1               | 231:21 233:16              | gentlemen 6:4             | 51:14 62:6 64:7           |
| <b>frown</b> 162:10        | 365:11 384:5              | 234:15 242:9               | geochemical               | 86:15 111:22              |
| frustrated 164:1           | <b>funds</b> 62:6 68:1    | 243:2 272:19               | 203:15                    | 139:10 147:8              |
| <b>fuel</b> 17:3 163:13,14 | 127:12 157:10             | 334:20,21 388:8            | geodesy 79:5 207:8        | 155:12 166:1              |
| 163:15,18 282:13           | 163:11 189:22             | 391:3 392:6                | 207:10,13 225:16          | 179:17 199:6              |
| 296:11,17 297:1,1          | 225:19,21                 | Gary's 240:20,22           | <b>geodetic</b> 2:9 12:8  | 216:7 230:10              |
| 312:17 342:12,14           | <b>funnel</b> 307:3       | <b>gas</b> 152:8 343:6,7,7 | 15:10 44:21 79:4          | 233:12 234:9              |
| 343:4 344:3,15,15          | <b>funny</b> 341:13       | Gasco 343:4                | 80:20 81:2 83:2,3         | 237:3 241:17              |
| 345:3 349:13,14            | <b>furious</b> 380:1      | gather 9:7                 | 154:11 155:7              | 244:22 246:19             |
| 349:17,18                  | <b>further</b> 57:14      | gauge 148:2 189:8          | 206:22 207:4,11           | 248:5 263:20              |
| <b>fuels</b> 343:12        | 114:20 119:3              | 244:6 270:17               | 207:14 208:1,3,9          | 269:3,9 284:5             |
| <b>Fugro</b> 74:5          | 296:4 361:19              | 271:7,9                    | 209:4 210:1 211:4         | 338:6 339:3 355:5         |
| <b>fulfill</b> 360:17      | 367:6                     | gauges 69:13,22            | 211:8,22 213:1            | 364:14 378:10             |
| <b>full</b> 99:15 142:10   | <b>future</b> 27:20 46:11 | 70:3,4 82:14,15            | 214:7 216:4               | 395:11                    |
| 267:14 312:2               | 71:7 79:14 91:9           | 121:17 238:22              | 218:17 220:12             | <b>gift</b> 30:20         |
| 334:17 337:4               | 91:13 166:20              | 239:1,3,8,13,18            | 222:14 228:10             | <b>Gill</b> 147:16        |
| <b>fully</b> 15:7,15 28:9  | 169:9 177:15              | 239:20 240:11,13           | 231:9 232:3               | <b>GIS</b> 214:20 229:18  |
| 65:1 94:13 190:8           | 188:20 202:20             | 240:15,19 241:11           | 240:12,14 368:8,9         | 239:17                    |
| 244:16 332:2               | 209:15 212:13             | 258:1,15,17                | 377:7,14 383:14           | GIS/GPS 83:20             |
| 350:4 388:5                | 236:8 239:21              | 260:15 261:3,4             | 383:17                    | <b>give</b> 9:4 12:20     |
| <b>fun</b> 194:3 274:15    | 243:9 244:22              | 263:8 265:21               | geodetically 222:15       | 17:13 30:18 31:2          |
| 348:6 357:4                | 254:2 257:2               | 269:1,22 270:6             | GeodeticSurvey            | 95:2 96:4 100:19          |
| functions 180:20           | 260:12 308:9              | 271:13,15 273:9            | 4:12                      | 102:13 107:6              |
| 222:13 288:11              | 388:5 400:1               | 273:22 317:10,14           | geographic 82:2           | 110:7 133:12              |
| <b>fund</b> 49:17 57:12    | <b>FY</b> 188:20 201:7,10 | gauging 238:12,21          | 385:15                    | 134:14 138:1              |
| 61:6 62:9,10,15            | 201:14 221:17             | 240:5                      | geography 75:14           | 150:17 176:4              |
| 62:18 63:4,6,13            | 223:21 224:13,14          | gearing 49:8               | geoid 221:2               | 206:1 209:15              |
| 63:15 64:7,22              | 224:15,15 225:11          | Gee 246:7 253:7            | Geological 217:21         | 220:16 335:7              |
| 65:9 66:1 67:22            | 225:12 257:13             | general 26:15              | geophysical 74:4          | 341:21 345:10             |
| 68:3,14,19 69:3            | G                         | 28:21 57:6 58:14           | George 161:9              | 353:18 377:20             |
| 71:8 87:13 154:5           |                           | 184:9,9 262:11             | geospatial 5:17           | 389:21 398:13             |
| 154:21 352:9               | G 2:21                    | 342:19 386:13              | 15:10 151:20              | 399:14                    |
| fundamental 99:11          | <b>gain</b> 265:4         | 392:17                     | 152:12 154:20             | <b>given</b> 33:10 50:16  |
|                            |                           |                            |                           | <u> </u>                  |

|                                    |                           |                                     | 1                                  |                              |
|------------------------------------|---------------------------|-------------------------------------|------------------------------------|------------------------------|
| 60:4 109:12                        | 250:2 263:8               | 27:16 28:4 31:15                    | 255:2,3 257:8                      | 170:11,15 174:1,9            |
| 119:11 374:1                       | 264:14 275:15             | 31:20 32:1,15                       | 259:10,19 261:8                    | 177:3 179:12,16              |
| 394:4                              | 278:14 279:7              | 34:6,9,11,12 36:2                   | 262:4 264:1,1                      | 185:13,20 186:2,5            |
| gives 163:17 201:5                 | 283:4,22 284:8            | 36:4 37:15 40:7                     | 265:18 266:3,4                     | 198:6 200:13                 |
| 250:14 253:20                      | 285:4 291:5,13            | 42:14 44:11,12,13                   | 268:17 275:4,14                    | 230:20 232:18                |
| giving 13:22 32:4                  | 293:10 294:18             | 46:9 48:3,9,19                      | 278:9 279:17                       | 240:13 245:12                |
| 336:19                             | 295:21,22 296:1,2         | 49:11,14,15 52:12                   | 284:2,8,19 286:21                  | 248:1 251:9,14,15            |
| gizmos 101:20                      | 296:15,19 298:19          | 55:11 57:17,19                      | 289:11 291:5                       | 254:10 274:15                |
| glad 153:15 306:11                 | 300:2 305:11              | 58:9 59:17 60:9                     | 292:17 294:7                       | 275:20 276:16                |
| 354:3                              | 306:2 309:2,9             | 61:1 63:16 67:15                    | 297:5 302:7                        | 287:13 305:22                |
| <b>Glang</b> 2:13 4:8              | 311:18 312:4              | 67:19 70:15 71:2                    | 303:13,16 304:6,8                  | 314:6 318:17                 |
| 85:6,7 88:4,18,20                  | 313:3,13,15 314:1         | 71:14 74:3 79:12                    | 304:13,18,19                       | 319:16 321:18                |
| 90:17 93:4,12                      | 315:15 323:10             | 87:20 88:3 89:20                    | 305:6 306:10,18                    | 325:17 326:1                 |
| 113:1 116:8 119:1                  | 338:22 341:11             | 96:13 98:20                         | 307:14 308:18,19                   | 330:17 342:6                 |
| 119:5,6 143:9,9                    | 347:3 348:15              | 102:20 108:5,15                     | 309:1 311:6 312:3                  | 349:20 352:6                 |
| 170:10 193:7,17                    | 349:11 361:3              | 109:3,4,5 110:1,5                   | 312:8,8,13,21                      | 357:22 364:17                |
| glaring 352:18                     | 367:20 375:17,17          | 110:6 115:20                        | 313:1,3 318:4                      | 367:4 369:8                  |
| <b>glaze</b> 137:16                | 375:18 376:16             | 118:1,3,8,12,15                     | 319:4 321:7,19                     | 371:20 381:10                |
| global 26:21 141:2                 | 378:6 380:19              | 118:18 119:10,13                    | 325:12 327:2,16                    | 384:19 386:15                |
| 263:10 370:10                      | 383:9 384:1               | 119:22 120:22                       | 327:17 332:13,17                   | 392:5                        |
| globally 48:13                     | 385:14,19,21              | 121:14 122:14,15                    | 332:19 334:11                      | <b>goodwill</b> 230:19       |
| GLONASS 79:8                       | 392:15 394:13,14          | 123:4,14 124:10                     | 335:8,10,14 336:1                  | <b>Google</b> 249:13,13      |
| <b>Glor</b> 262:7                  | 400:11                    | 127:15,20 134:9                     | 336:3 337:11                       | 331:15                       |
| <b>go</b> 6:21 7:8 8:21 9:6        | goal 38:7,8,12,15         | 134:10,13 136:15                    | 339:13 340:8,19                    | gosh 33:10 37:21             |
| 10:12 23:18 30:11                  | 38:15,16,22 39:13         | 137:19 140:5                        | 341:22 342:16                      | 48:16 374:9                  |
| 34:7 37:9,15                       | 85:10 89:6 91:16          | 142:3,3,8 143:8                     | 348:1,22 351:12                    | gotten 55:6 96:20            |
| 41:18 42:11 48:9                   | 91:18 190:19              | 143:14 147:4                        | 353:13,15 359:1                    | 111:6 156:12                 |
| 53:6 60:1 72:7                     | 202:19 210:7,13           | 149:22 150:1                        | 363:8 364:14                       | 190:2 202:2,12               |
| 89:1 91:5 95:13                    | 211:3 223:20              | 153:18 155:4,8,12                   | 365:15 373:16                      | 260:15 266:1                 |
| 113:7,20 114:4                     | 224:5 225:2 399:9         | 156:4 163:16                        | 374:9 375:7 376:5                  | 322:22 346:17                |
| 119:1,4 123:17                     | goals 43:14 91:19         | 165:20,22 169:1                     | 376:21 377:2,20                    | 352:4                        |
| 124:13 126:11                      | 224:14 305:14             | 171:6 172:11                        | 378:6,7,13 379:8                   | governed 385:10              |
| 135:14 137:13                      | goats 340:17              | 174:2 177:17,18                     | 379:21 380:5,13                    | government 15:17             |
| 142:11 147:12                      | God 11:4 302:10           | 178:6 180:2                         | 391:14 400:5,14                    | 18:3 53:1 58:16              |
| 151:7 157:6 160:1                  | 307:13                    | 183:18 186:8,12                     | 400:15,17 401:16                   | 62:10,11 68:20               |
| 160:14 164:17                      | goes 65:8 82:19           | 189:11 190:8,14                     | 401:17 402:3,10                    | 95:15,21 96:9,14             |
| 165:10 169:12                      | 117:5 128:1 154:5         | 192:13 193:9                        | <b>Golden</b> 183:15               | 102:4 132:12,13              |
| 175:14 184:4                       | 164:14 191:13             | 198:2,3 201:12                      | <b>good</b> 6:4 15:13 19:6         | 133:9 138:20                 |
| 186:8 187:11,13                    | 232:7 282:8               | 205:4,7,9,10,12                     | 21:13,15 33:2                      | 146:18 165:20                |
| 191:15 199:21                      | 291:14 315:6,9            | 210:17 211:3                        | 34:10 40:12,13                     | 174:11 177:16                |
| 203:18 205:21                      | 326:5 332:16              | 220:16 222:14                       | 71:18 75:11 76:6                   | 191:22 194:8,10              |
| 206:10 207:9                       | 340:9 342:12              | 224:15 230:13                       | 78:19 81:3 85:6                    | 194:13 200:12                |
| 210:21 211:20<br>214:22 216:21     | 349:7 372:14,15<br>395:21 | 236:6,7 237:6<br>239:12,19 240:5    | 89:3 118:21 119:8<br>120:16 121:16 | 210:6 227:21<br>229:9 237:16 |
| 214:22 216:21<br>218:21 231:14     | <b>going</b> 6:19,21 8:7  | 239:12,19 240:5 240:14,17 243:3,7   | 120:16 121:16<br>125:3,12 147:3    | 278:5 280:6 353:3            |
| 218:21 231:14<br>235:4 243:9 246:4 | 17:7 18:8,10 22:4         | 240:14,17 243:3,7<br>245:2,13 251:7 | 125:3,12 147:3                     | 278:5 280:0 555:5<br>398:21  |
| 233:4 243:9 240:4<br>247:11 249:13 | 26:20 27:2,4,16           | 243:2,13 231:7<br>253:6,8 254:14    | 168:13 169:6                       | Governmental                 |
| 241.11 247.13                      | 20.20 27.2,4,10           | 233.0,0 234.14                      | 100.13 107.0                       | Governmental                 |
|                                    |                           |                                     |                                    |                              |

|                       | _                  | _                       | _                                 |                    |
|-----------------------|--------------------|-------------------------|-----------------------------------|--------------------|
| 266:16                | 135:6,15 136:21    | 291:15,19,20            | guys 31:11 32:19                  | happen 8:8 36:1    |
| governments 11:20     | 145:13 172:11      | 293:14 295:22           | 50:17 51:14 78:2                  | 118:18 121:18      |
| government's          | 173:21 182:7       | 296:20 317:6            | 94:12 114:9 162:4                 | 127:15 142:8       |
| 150:13                | 222:18 243:4       | guarantee 382:1         | 172:3 228:11                      | 205:12 215:18      |
| governor 3:10 6:22    | 255:3 256:15       | 384:3                   | 234:7 235:19                      | 253:3 255:4 256:1  |
| 11:13,14 13:3,18      | 262:5 280:2 287:4  | <b>Guard</b> 2:4,4,14   | 309:21 315:4                      | 303:6 304:6        |
| 19:17 20:3,21         | 295:22 296:3,7,10  | 4:20 75:19 80:10        | 318:1 322:16                      | 308:16 321:8       |
| 21:14 24:15,19        | 308:12 309:16      | 138:20 151:10           | 323:5 346:18                      | 332:13 348:22      |
| 25:4 26:8 27:21       | 310:16 313:11      | 184:15 190:3            | gyre 335:19                       | happened 180:21    |
| 28:20 30:15 31:18     | 315:10,18 329:20   | 194:19 282:6            |                                   | 183:16 249:16      |
| 33:1 51:8 131:18      | 342:15 346:22      | 285:1,6 286:13          | H                                 | 285:21 301:18      |
| 397:16                | 366:14 368:10      | 298:10 313:4,14         | HAB 261:22 262:5                  | 303:13 313:22      |
| Governor's 50:15      | 374:21 397:10      | 314:4,9,11,17           | habitat 74:21 76:11               | happening 118:2    |
| GPRA 210:6,16         | greater 142:7      | 315:1,20 318:20         | 83:16 84:6,6                      | 212:21 213:9,10    |
| 214:1 224:21          | greatest 210:5     | 320:21 323:12           | 185:16,21 261:13                  | 218:3,4 223:13     |
| GPS 70:3,8 72:20      | greatly 321:4      | 324:1 331:7 348:8       | 262:15 328:16,18                  | 241:18 305:2       |
| 79:8 169:14           | green 221:9,12     | guarding 293:6          | 329:10 369:16                     | 317:11             |
| 222:18 223:7,13       | 249:4              | Guard's 318:13          | 370:12 372:4,9                    | happens 27:1 34:18 |
| 223:15 226:12         | grew 209:1         | guess 30:21 85:4        | 373:1,7                           | 50:11 127:16       |
| 232:9,22              | gross 22:19 253:15 | 90:10 95:17             | habitats 84:1,12                  | 226:4 232:6 238:7  |
| graders 70:10         | ground 78:8        | 103:19 106:11,15        | hacks 66:2                        | 258:11 307:6       |
| graduated 290:13      | 208:18 218:1       | 145:8 146:4 155:9       | Halakua 307:22                    | 338:9 344:20       |
| <b>GRANQUIST</b> 2:14 | 366:9              | 160:8 164:19            | Haleakala 307:2                   | happy 19:13 30:8   |
| grant 14:18 85:1      | group 12:4 33:8    | 166:18 176:13,15        | 350:3                             | 34:1 60:7 78:18    |
| 193:2 254:13,18       | 40:5 43:8 52:3     | 200:11 205:8,15         | half 78:3 81:18                   | 131:3 260:17       |
| 264:17 272:22         | 67:6,7 73:1,22     | 285:3 316:4             | 93:20 127:10                      | 291:3 305:20       |
| 355:5                 | 79:13 94:1 109:11  | 321:16 332:15           | 128:6 156:14                      | 373:21 374:14      |
| graph 248:11 250:5    | 167:22 168:5       | 334:2 361:22            | 183:11 224:5                      | harbor 24:11,17    |
| graphics 204:10       | 173:18 206:13      | 363:3 380:7             | 248:5 290:20                      | 25:6,13 49:17      |
| grateful 14:2         | 228:8 231:15       | 389:16 395:14           | 295:3 297:2 308:1                 | 60:18 61:6 63:4    |
| gravimeter 221:22     | 237:14,15 238:19   | 400:9 401:10            | 346:19                            | 63:15 64:6,22      |
| gravimetric 221:1     | 240:20,22 274:17   | guest 176:9             | <b>Hamakua</b> 306:22             | 67:21 68:19 69:3   |
| gravity 209:6         | 300:10 303:8       | guests 7:3 9:13         | Hamilton 2:15                     | 71:7 74:19 87:13   |
| 220:19,21 221:20      | 326:16 331:7,16    | 176:7,16 274:19         | 368:2,2                           | 97:14 133:21       |
| <b>GRAV-D</b> 46:6    | 331:19 333:5       | 275:18 403:6            | hand 10:4,6,12                    | 149:6,7 153:21     |
| 207:8 210:22          | 343:8 355:4 362:7  | guidance 92:2           | 268:11 274:19                     | 235:6 248:8        |
| 219:18 220:2,19       | 362:8 364:8        | 114:3 120:6             | 328:12 356:7                      | 278:15 286:3       |
| 221:5 224:21          | 365:16 390:14      | 172:18 266:6            | handle 280:18                     | 298:11 299:9       |
| 225:1                 | 397:14             | 282:21 384:6            | 300:4 356:22                      | 308:21 326:18      |
| gray 140:1            | groups 41:2 151:21 | guidelines 212:16       | handles 342:6                     | 327:3,4 328:20     |
| great 9:20 30:5       | 236:20 329:17      | Gulf 62:3 83:22         | handling 130:19                   | 330:12 337:20      |
| 35:22 40:3 50:9       | 331:5 359:22       | 124:20 182:11           | 334:8<br>handouts 218:20          | 339:18 346:17      |
| 76:11 77:15 79:17     | 362:6 379:2        | 188:11,13 234:10        |                                   | 348:1,17 360:7     |
| 80:22 101:20          | 392:18             | 241:11 257:5,6,9        | hands 67:8 274:16<br>hand-in-hand | 386:21             |
| 103:18 104:9          | growing 14:13      | Gustav 242:20           | 208:7                             | harbors 22:3 25:9  |
| 126:8 127:1           | 79:14 119:12       | <b>guy</b> 142:19 280:7 | 208:7<br>Hanson 87:10             | 50:1 65:20,22      |
| 132:10 133:11         | <b>Guam</b> 269:21 | 334:19 395:21           | 11alisuli 07.10                   | 76:10 98:4 99:6    |
|                       | l                  | l                       | l                                 | l                  |

٦

|                           |                   | 1                         | 1                         |                     |
|---------------------------|-------------------|---------------------------|---------------------------|---------------------|
| 149:4 180:5,14            | 351:20 362:2      | 308:11 309:11             | 362:5 374:5               | 219:2 227:18        |
| 329:7 347:13              | 369:16 378:3      | 323:18 340:18             | helpfully 346:18          | Hilo 301:15 302:1,7 |
| 355:1,17 360:22           | 379:4,9 382:7     | 343:9,20 379:9            | helping 22:4              | 302:13 339:21       |
| hard 35:14 43:15          | 395:9,13 396:4,9  | 391:4                     | 186:17 264:13             | 349:8,10,14         |
| 51:11 113:15              | 397:7             | hearing 109:22            | 265:3 352:11              | historic 147:1,9    |
| 130:7 155:16              | Hawaiian 2:2,20   | 172:2 221:5               | 371:4                     | 148:1               |
| 161:22 187:5              | 4:18 14:6 20:6    | heart 138:1               | helps 361:12,13           | historically 159:11 |
| 228:22 263:14,16          | 54:20 277:18      | heats 346:9               | 374:13                    | history 54:1 158:1  |
| 270:12 289:20             | 298:3 319:4       | heavily 184:10            | heritage 370:2            | 207:11 292:5,6      |
| 294:14 352:5              | 331:18 337:8      | 288:2                     | hey 66:18 102:22          | hit 20:16 180:2,8   |
| hardening 28:5            | 370:3,15 371:17   | heavy 280:20 287:7        | 114:10 319:18             | 186:11 243:9        |
| 241:11,13,13              | 372:8             | 289:3 345:19              | HFR 357:20 359:7          | 249:2 268:5         |
| 245:2 267:4               | Hawaii's 14:18    | Height 225:17,22          | Hi 116:11 363:22          | 301:15,15,16        |
| 270:11                    | 23:4 27:19 30:5   | heightened 124:17         | Hickman 1:22 73:7         | 304:18 305:8        |
| harmful 261:16            | 184:22 278:2      | heights 210:15            | 73:7 108:2 135:4          | 317:20              |
| harm's 183:19             | 298:11            | held 165:18 202:20        | 135:5 136:7,9             | hits 305:7,12       |
| 258:22 370:17             | Hawai'i 3:10      | 333:22                    | 137:7 149:19,19           | 336:12 346:14       |
| Harris-Galveston          | hazard 124:22     | hell 127:11 155:15        | 164:3,4,16 165:9          | hitting 173:3       |
| 217:21                    | 159:5,16 259:6    | help 9:7 11:4 36:11       | 167:6,12 273:7,10         | 258:15 301:16       |
| <b>Hassler</b> 136:6      | 335:2 336:4,6     | 45:19 62:1,3              | 273:14 274:1              | Hi'ialakai 395:12   |
| 189:11,13                 | hazardous 316:17  | 81:11 89:3 90:21          | 322:1                     | 395:19              |
| hastily 333:21            | hazards 125:2,11  | 92:4 107:14 114:9         | hidden 297:8              | hobbling 123:21     |
| Hau 175:12 402:19         | 125:11 180:20     | 114:19,19 119:20          | high 28:22 72:20          | <b>hoc</b> 379:3    |
| haul 343:3,4              | 258:1 316:12      | 120:20 126:1              | 114:19 139:21             | <b>hoe</b> 61:12    |
| havoc 287:12              | 364:11            | 135:18 136:21             | 189:4 203:21              | hold 147:22 173:17  |
| <b>Hawaii</b> 1:16 2:2,12 | head 49:2 115:21  | 171:20 184:1              | 249:5 252:2               | 277:12 290:6        |
| 4:15 11:13 12:10          | 131:19 174:21     | 185:10 188:17             | 255:14 258:3              | holdings 190:14     |
| 12:15,18 13:8,18          | 175:13            | 206:16 217:8              | 265:19 267:10             | hole 204:3          |
| 13:22 14:10,12            | headed 326:22     | 235:14 238:16             | 285:15 347:9              | holistically 103:9  |
| 20:4,16 21:20             | heading 293:20,21 | 247:16 254:7              | 380:11                    | home 190:11         |
| 26:2,3,18 28:17           | 294:2             | 262:20,22 284:7           | higher 19:1 248:22        | 275:15 369:17       |
| 28:21 32:6 77:1           | Headquarters      | 287:4 301:5               | highest 11:21 117:8       | Homeland 223:3      |
| 77:11,13 127:4            | 81:11 362:20      | 303:12 304:16,22          | 319:7 370:4 371:3         | 226:11              |
| 180:3 230:10              | heads-up 332:15   | 305:17 317:17             | 375:16 383:3              | homes 22:6          |
| 245:21 246:3,3,6          | headway 322:22    | 325:2 353:3,17,20         | highlight 117:11,20       | honest 297:7        |
| 247:10 248:10             | Healthy 85:1      | 358:1,5,14 359:4          | 211:17                    | 304:22              |
| 249:15 259:2              | hear 60:10 88:8   | 380:8                     | highlighted 213:21        | Hong 294:10         |
| 270:3 276:16              | 90:20 91:12       | helped 111:9              | highlighting 107:8        | Honolulu 1:16 2:14  |
| 277:21 280:11             | 133:13,17 134:7   | 131:12 135:14             | highly 214:3,3            | 76:21 288:8         |
| 288:6 298:8               | 134:15,16 137:5   | 186:3 253:22              | highway 133:14            | 290:22 291:19       |
| 299:13 300:5,13           | 172:11 177:11     | 260:19 284:13             | highways 133:16           | 292:1 293:13        |
| 301:6,10 303:4,14         | 307:7 341:15      | <b>helpful</b> 64:8 172:9 | 355:1                     | 317:4 326:17,18     |
| 303:17 304:9              | 354:16 398:4,20   | 215:15 219:4              | <b>Hiko</b> 343:13        | 328:17,20 340:7     |
| 306:17 310:13             | heard 40:10 42:1  | 284:4 285:13              | <b>Hill</b> 51:3 54:15,16 | 342:13 360:7        |
| 314:14 316:1              | 92:9 116:13 127:1 | 289:18 303:8              | 55:7 59:3 120:20          | 368:3               |
| 321:15 327:3              | 148:20 170:15     | 306:13 309:15             | 124:7 127:11              | honor 76:18         |
| 332:14 336:20             | 203:3 207:7 308:8 | 311:1 361:10              | 139:10 194:4              | Honorable 4:4       |
|                           | I                 | I                         | I                         | l                   |

| 11.10                  |                           |                           | 100.11                    |                        |
|------------------------|---------------------------|---------------------------|---------------------------|------------------------|
| 11:12                  | Houston-Galvest           | 107:4 177:5               | 123:11                    | 119:22 121:13          |
| hook 317:19            | 69:15                     | 178:19 181:1,4            | ignorance 146:4           | 125:2 131:20           |
| hooked 376:18,20       | <b>how's</b> 347:2        | 185:6 187:8 238:1         | <b>ignore</b> 265:22      | 141:5,6,17,19          |
| hope 13:11 35:21       | <b>HSRP</b> 1:6,18 4:8    | 240:2 379:8,14            | <b>Ike</b> 69:18,22       | 168:14 171:8           |
| 72:1 115:17            | 5:22 78:21 81:21          | hydrography 96:8          | 242:20 322:8              | 172:18 188:22          |
| 171:15 227:17          | 82:11 83:12               | 97:21 101:21              | <b>Illinois</b> 76:12     | 218:2 221:19           |
| 298:6 305:18           | 362:14                    | 139:19                    | illustration 242:6        | 241:16 272:3           |
| 365:21 385:7           | <b>hub</b> 291:18         | hydrokinetic-dri          | illustrations 242:12      | 282:20 299:3,18        |
| 403:8                  | huge 42:9 50:19           | 251:10                    | <b>imagery</b> 215:5,12   | 301:6 305:15           |
| hopeful 115:12         | 96:20 141:9               | hydrological              | 216:2,5,8 304:20          | 309:9 312:22           |
| hopefully 51:9         | 149:15 268:21             | 215:14                    | <b>imagine</b> 66:2       | 317:7 332:17           |
| 92:17 221:13           | 301:22 375:8              | hydrology 84:3            | 230:12 337:8              | 346:3 383:16           |
| 229:7 241:15           | 396:19                    | HYDROPACs                 | 384:14 401:15             | <b>importer</b> 133:19 |
| 300:3 303:5 401:2      | hugely 141:6              | 316:19                    | immediate 399:17          | <b>imports</b> 65:4    |
| hoping 32:20 36:4      | <b>huh</b> 31:22          |                           | immediately 33:9          | imposes 165:6          |
| 39:17 88:6 114:9       | hulled 317:1              | <u> </u>                  | 290:15                    | imposing 165:5         |
| 142:19 170:13          | human 21:10 95:22         | ice 20:2 43:17 44:1       | <b>IMO</b> 283:4 370:1    | impossible 119:14      |
| 287:5                  | 369:20                    | 44:5 45:3 149:8           | impact 21:2,17,19         | 155:13                 |
| Horizon 203:14         | Humanitarian              | 186:14 269:1,4            | 22:9 58:3 78:8,13         | <b>impress</b> 393:1   |
| horizons 398:3         | 389:5                     | 366:13 398:5              | 78:16 273:1 304:8         | impressed 31:19        |
| horizontal 222:3       | humans 140:11             | icebreaker 75:22          | 356:19                    | 32:8                   |
| horrible 136:16        | Humboldt 254:17           | 139:14                    | impacted 24:12            | impression 363:9       |
| horse 123:16,16,19     | humpback 14:7             | idea 58:14 120:22         | impacts 20:18             | 390:13                 |
| 150:2,3 309:11         | 287:20                    | 124:6 127:1               | 27:18 288:20              | <b>improve</b> 84:11   |
| horses 340:17          | hundred 12:17             | 146:12,16 153:17          | 370:9,12 372:20           | 144:6 243:19           |
| hospitality 30:6       | 14:13 19:11               | 155:10 156:9              | implement 28:5            | 247:6,16 318:5         |
| <b>HOST</b> 299:3,8,11 | hunting 153:8             | 157:18 179:16             | 193:10 220:1              | improved 214:12        |
| 302:4 330:20           | hurdles 117:3             | 197:22 201:6              | implementation            | 222:4                  |
| 331:4 356:3            | hurricane 259:7           | 280:2 332:7 335:8         | 191:11 282:2              | improvement            |
| hostile 269:8          | 287:9 301:15              | <b>ideal</b> 107:11 110:6 | implemented               | 210:16 211:9           |
| <b>hot</b> 348:18      | 326:20 330:5              | ideally 374:3             | 145:21 167:14             | improvements           |
| <b>hotel</b> 29:8      | 339:15                    | ideas 92:1,13 94:13       | implications              | 91:10 107:5            |
| hour 307:9 350:14      | hurricanes 27:18          | 146:6 170:11,15           | 227:22                    | 145:15 209:18          |
| hours 105:5 180:1      | 215:9 234:11,13           | 171:3                     | importance 12:15          | 210:3 277:2            |
| 317:16 330:6           | 241:10 242:11,20          | identical 227:15          | 15:12 26:17 96:7          | improving 144:16       |
| house 2:15 36:21       | <b>hydro</b> 76:14 201:20 | identification 4:22       | 111:22 113:8              | 233:14 300:4           |
| 44:16 50:7 59:20       | 202:2                     | 130:11 206:1              | 114:21 121:22             | inaccurate 126:15      |
| 60:5 80:7,8 82:10      | hydroacoustic             | 401:4                     | 211:1 212:22              | inboard 361:6          |
| 104:13,14 123:2        | 204:6                     | identified 124:1,2        | 332:14                    | inbounders 282:14      |
| 194:7 199:16,17        | hydrocarbon               | 130:15 191:21             | <b>important</b> 13:15,17 | inches 242:16          |
| 276:1,5,12 335:9       | 204:16                    | 367:16                    | 14:10 15:3 16:21          | <b>incident</b> 150:22 |
| houses 304:12          | hydrographer 77:8         | identify 24:5 120:7       | 19:8 26:3,6 32:5,7        | 160:2 183:17           |
| 337:9 389:11           | hydrographers             | 216:15 329:19             | 35:15,16 45:8             | 239:10 301:14          |
| housing 29:8           | 95:13 185:18              | 367:20 389:10             | 46:14,17 51:1,6           | incidental 157:20      |
| Houston 73:8           | hydrographic 1:6          | identity 282:3            | 51:17 83:18 91:3          | incidentally 342:2     |
| 135:5 182:9 218:7      | 1:14 6:5 8:10,14          | ideological 17:11         | 104:7 107:6 112:3         | incidents 138:9        |
| 322:4,8,11 323:2       | 74:4 79:2 81:1            | ideologically             | 112:6 114:12,13           | 151:7                  |
|                        |                           |                           |                           |                        |
| L                      |                           |                           |                           |                        |

|                            | 226 17 242 6        | • •                        | 0(0 1 202 10            | 220.11                    |
|----------------------------|---------------------|----------------------------|-------------------------|---------------------------|
| <b>include</b> 266:3,5     | 326:17 342:6        | infrastructure-re          | 260:1 383:18            | 338:11                    |
|                            | infamous 191:19     | 152:10                     | <b>integrated</b> 47:9  | internal 54:13,18         |
|                            | inference 191:18    | <b>infusion</b> 111:2      | 69:20 71:2 85:22        | 55:9 237:15               |
|                            | information 9:7     | initial 89:13 109:6        | 140:14 244:15           | internally 129:14         |
| <b>includes</b> 201:20     | 14:3 15:12 18:8     | 247:21 249:7               | 261:5 291:10            | international 29:20       |
| 330:8,10                   | 82:2 94:2,12        | 258:12 264:3,5,11          | 362:18                  | 100:22 222:18             |
| <b>including</b> 14:3 68:9 | 100:20 130:14       | <b>initially</b> 107:2,3   | integrating 47:13       | 282:18 388:2              |
| 75:21 80:3 82:14           | 134:14 140:12       | 363:18                     | 140:22 272:15           | internationally           |
| 101:17 130:5               | 148:14 150:15,21    | <b>initiated</b> 218:10    | Intelligence 383:19     | 29:17 228:5               |
| 145:21 180:2               | 166:22 169:17       | <b>initiative</b> 48:10,16 | intelligent 41:18       | internet 361:1            |
| 289:9 385:13               | 170:18 172:14,19    | 49:4 90:19,22              | intend 179:15           | interoperability          |
| 391:10                     | 187:1 209:6         | <b>initiatives</b> 118:4   | intended 35:5           | 238:21                    |
| inclusive 174:18           | 210:11,12 211:1     | 191:2 379:8                | 176:15 398:7            | interruption              |
| inconsiderable             | 211:21 213:2        | inland 239:4               | <b>intense</b> 88:10    | 288:12                    |
| 22:21                      | 214:17,19 216:19    | 251:19 297:19              | intent 91:20 195:14     | intertidal 84:6           |
| incorporate 71:5           | 217:12,17 222:5     | inner 280:15               | 203:5 270:5             | introduce 56:11           |
| 134:21                     | 226:15,16 228:14    | innovate 148:8             | intention 86:20         | 72:8 369:5                |
| increase 36:1 118:9        | 229:17 233:19       | innovation 91:10           | inter 306:20            | introduced 232:11         |
| 118:15 191:7               | 235:2 237:20        | 146:14 149:2,10            | interact 105:4          | 394:17                    |
| 312:14                     | 238:3,6 243:19      | 169:9,20                   | 276:19                  | introducing 367:17        |
| increased 347:6            | 247:15 249:5        | <b>Inouye</b> 397:5,6      | interest 30:5 41:10     | Introduction 4:6          |
| increases 34:10            | 250:2,13,16 251:8   | Inouye's 14:16             | 41:14 74:14 326:3       | inundated 304:7           |
| 307:18                     | 259:4 260:2,5,10    | <b>input</b> 260:6 399:14  | 330:22 353:11           | inundation 126:17         |
| incredible 369:17          | 263:11,15 268:3     | 399:19                     | 362:6 382:19            | invented 146:15           |
| 371:5 372:5,13             | 268:21 272:18       | <b>inserts</b> 319:3,9     | 394:7 399:11            | inventory 139:13          |
| incumbent 94:22            | 286:12 295:19       | <b>inside</b> 319:6 346:17 | interested 59:6         | 190:19 239:16             |
| independent 8:12           | 296:7 297:13        | 346:20 347:2               | 63:5 75:1 77:14         | 288:11                    |
| indicate 199:8             | 299:11 302:12       | 384:2                      | 86:16 90:2 93:15        | <b>invest</b> 59:12,13,17 |
| 373:4                      | 307:19 312:22       | insight 96:4               | 122:3 214:21            | 144:22 169:6              |
| <b>indicated</b> 12:3 54:6 | 314:22 319:14,18    | inspections 14:6           | 283:10 294:16           | investing 60:6            |
| 168:5                      | 322:18 323:13       | <b>inspires</b> 333:11     | 297:15 361:18           | 95:21                     |
| indications 204:15         | 325:18 326:1        | install 222:8              | 362:4 383:15            | investment 25:9           |
| indigenous 140:21          | 335:16 345:11       | installation 253:19        | 397:1                   | 46:22 168:6,14,22         |
| individual 59:16           | 358:22 359:9        | installed 253:2            | interesting 32:12       | investments 49:22         |
| 63:11 392:20               | 364:11 380:3        | <b>instance</b> 395:18     | 49:6 63:3 79:9          | 59:9                      |
| individually 72:2          | 390:17              | Institute 24:7             | 84:7 130:20 153:6       | <b>invited</b> 333:10     |
|                            | informed 332:9      | 76:20 82:3,10              | 154:8 162:3 279:9       | <b>involved</b> 15:1 39:8 |
| individuals 8:12           | 362:1               | instruction 385:11         | 285:9 300:8             | 40:17 61:5 62:12          |
|                            | infrastructure 17:5 | 385:12                     | interests 8:13          | 75:15 76:3 83:13          |
| 356:12                     | 19:5 21:21 24:21    | instructions 400:8         | 59:11 72:4 76:1,2       | 84:16 85:9 86:18          |
| industries 124:9           | 25:14,18 27:6       | instrumental               | 200:19 366:7            | 86:19 127:22              |
| industry 18:16             | 40:4 44:15 70:18    | 174:14                     | <b>interface</b> 169:14 | 143:14 151:22             |
| 42:7 63:17 64:7            | 91:10 95:22         | instrumentation            | interference 223:7      | 174:5 184:11,16           |
| 99:1 108:20                | 105:16 144:13       | 70:1                       | 223:15                  | 184:21 185:17,22          |
| 181:14,15 278:11           | 182:20 193:13       | insurance 78:5             | intergovernmental       | 186:18 191:6              |
| 299:6 300:1                | 212:17 256:3        | insured 22:6               | 90:9                    | 220:13 238:19             |
| 304:11 324:21              | 269:20 270:4        | integrate 70:12            | interisland 337:18      | 240:20 277:9              |
|                            |                     |                            |                         |                           |

| 305:7 306:15            | 369:17 370:4,15                | 61:18,22 64:9              | <b>jobs</b> 35:17 117:8  | <b>Junior's</b> 150:8         |
|-------------------------|--------------------------------|----------------------------|--------------------------|-------------------------------|
| 332:3 334:6 355:6       | 371:17 382:6                   | 72:15,16,16 73:4           | 171:7 278:16             | jurisdiction 78:17            |
| 355:7 357:10            | isolated 287:3                 | 73:6 132:10                | 280:16                   | 396:3                         |
| 390:15                  | issue 34:17 37:12              | 292:14,16,22               | <b>John</b> 2:18,19 4:10 | justifications 169:1          |
| involvement             | 43:22 45:3 74:19               | <b>Jamie</b> 376:19        | 7:1,5 13:6 45:20         | justify 384:12,20             |
| 174:22 191:7            | 97:22 140:4 159:2              | <b>January</b> 306:7       | 80:13 158:13             | 391:5 392:3                   |
| involving 240:22        | 161:17 164:8                   | <b>Japan</b> 23:3 127:5    | 160:7 182:2              |                               |
| <b>in-house</b> 96:11   | 226:12 258:14                  | 179:20 303:13,16           | 185:17 199:21            | K                             |
| 108:16,18,19            | 259:12 319:2,21                | 303:22 304:4,8             | 206:20 266:10            | Kachemak 251:4                |
| 170:1                   | 323:22 324:2                   | 324:7 335:8,10             | 294:15 309:15            | <b>Kahalui</b> 339:20         |
| <b>IOCM</b> 191:1,4     | 326:6 334:15                   | 389:6                      | 329:3 333:17             | 343:22 344:1                  |
| ionosphere 232:8        | 347:18 349:1                   | Japanese 22:10             | 364:3 368:12             | Kahului 248:8                 |
| 232:12                  | 355:2,3 358:1                  | 23:2 121:6 179:21          | <b>Johns</b> 251:4       | 249:2 349:8,12,14             |
| <b>IOOS</b> 362:1,15,16 | 366:13 380:17                  | <b>Jay</b> 1:23 2:19 25:20 | <b>JOHNSON</b> 2:16      | Kailua 294:8                  |
| 362:20,21 363:1,3       | 395:5                          | 25:20 58:18,18             | Johnston 271:8           | Kaimoku 294:8                 |
| 363:4,9,17 364:7        | <b>issues</b> 32:4,6 42:5      | 59:1,19 74:12,12           | 279:1                    | Kainalu 294:8                 |
| 365:2                   | 43:18 74:17 75:3               | 121:4,4 126:5,5            | <b>join</b> 275:17,19    | Kalakaua 1:16                 |
| <b>IOOS.org</b> 364:18  | 82:17 133:2                    | 146:3,8 205:22             | joined 24:9              | Kalua 20:9                    |
| island 12:11 14:11      | 137:14 139:14                  | 271:17 272:1               | joint 24:7 76:20         | Kathy 3:17 81:21              |
| 20:5 128:5 185:2        | 143:16 159:20                  | 365:6,10                   | 211:15 212:14            | 113:5,5 175:9                 |
| 258:18,18 264:19        | 167:21 170:21                  | <b>JCS</b> 385:11          | <b>jointly</b> 77:12     | 176:12 274:16,22              |
| 271:8 278:16            | 172:17 173:9,12                | <b>Jeff</b> 73:20 161:5,6  | <b>jokes</b> 368:19      | 400:7                         |
| 280:15 281:4            | 173:18 174:17                  | 309:14 324:11,12           | jotted 95:9              | <b>Katrina</b> 239:10         |
| 283:17,19 288:9         | 178:3 179:8 183:6              | Jefferson 203:20           | <b>journey</b> 163:6     | 241:10 322:7                  |
| 294:21 295:1            | 189:12 190:10                  | 207:18                     | <b>Joyce</b> 1:24 23:20  | Kauai 339:12                  |
| 296:1,2 301:16          | 244:9,17,21                    | Jefferson's 235:4          | 24:4,6 56:7,10,14        | 342:9,17 343:14               |
| 302:10 306:7,21         | 254:11 261:2                   | <b>JEFFERY</b> 1:21        | 76:19 104:11             | 349:18                        |
| 308:1 311:19            | 262:6 315:13                   | <b>Jeffress</b> 1:23 27:12 | 105:6 111:13             | Kaumalapau                    |
| 312:10 314:13           | 345:20 346:2                   | 27:13,13 68:22,22          | 115:6 119:9              | 311:18 312:5                  |
| 319:4 321:6 332:4       | 347:12,16 354:18               | 69:11 70:19 79:9           | 126:20 141:11,12         | 345:14 349:13                 |
| 339:21 340:15           | 355:10 356:7                   | 82:1,1 116:9,11            | 143:11 145:22            | Kaunakakai                    |
| 342:11,16 343:13        | 362:10 365:11                  | 116:12 160:6               | 156:10 269:17,18         | 345:14 349:16                 |
| 349:9 359:8 360:2       | 366:20 399:5,18                | 171:7 203:11,13            | 328:12 379:5             | <b>Kawaihae</b> 339:22        |
| 371:19 373:1            | <b>ISTJ</b> 171:4              | 205:6,14 231:22            | <b>Joyce's</b> 116:13    | 346:2,7,17 347:13             |
| Islander 291:21         | <b>ITA</b> 48:11               | 234:6 272:20               | <b>JR</b> 2:18           | 347:20 348:1                  |
| islands 14:7 85:14      | item 127:22 275:21             | 334:20,21,21               | <b>Juan</b> 87:5         | 349:11,15                     |
| 179:21 224:4            | items 274:12                   | 388:9 391:4                | juggled 163:1            | <b>KC</b> 343:9               |
| 271:4,5 278:3           | iterative 205:13               | <b>Jeffrey</b> 300:18      | <b>Juliana</b> 2:9 4:11  | <b>Kea</b> 307:2              |
| 280:19 282:9            | It'd 35:22                     | <b>jellyfish</b> 336:17    | 46:8 80:18 206:22        | <b>Keehi</b> 24:11,22         |
| 287:4 288:4             | <b>it'll</b> 254:14            | <b>Jerry</b> 300:15        | 207:2 226:7,9,10         | 348:10                        |
| 289:18 291:18,22        | J                              | <b>Jessica</b> 2:22 328:3  | 232:1 234:15             | keenly 75:1                   |
| 297:14,19 308:17        |                                | 363:21,22                  | 235:3 238:11             | <b>keep</b> 21:3 36:4         |
| 331:18 337:8            | <b>J</b> 1:21                  | <b>JFK's</b> 150:7         | 376:4                    | 52:12 64:18 96:11             |
| 339:5 340:6,9           | <b>Jacksonville</b> 253:2      | <b>job</b> 6:10 147:3      | jump 62:1                | 104:2 108:16,18               |
| 342:8,13 346:7          | 253:16 254:12<br>Jacobsen 1:22 | 194:2 309:16               | jumping 123:15           | 109:4 143:13                  |
| 357:1,1,17,20           |                                | 311:9 313:9                | <b>June</b> 212:10       | 148:9 172:22<br>173:21 225:14 |
| 361:17 368:5            | 60:16,16,21 61:14              | 314:12                     | <b>junior</b> 397:8      | 173.21 223:14                 |
|                         | l                              | l                          | I                        |                               |

|                       | 1                   |                   |                   |                        |
|-----------------------|---------------------|-------------------|-------------------|------------------------|
| 268:17 281:9          | 58:15 59:2 62:17    | 20:15,16 21:10    | 234:22 235:3,5,21 | 391:21 392:14          |
| 307:1 345:2           | 67:15 72:22 78:7    | 22:18 25:2,16     | 236:3 238:22      | 395:1,9,16 396:3       |
| keeping 156:5         | 84:7 94:5,10        | 26:15 27:22 28:6  | 241:20 247:14     | 396:5,21 397:6,12      |
| 172:6                 | 112:2,10,11,12      | 28:8 30:1 32:14   | 249:7 250:1 253:7 | 397:15 399:1           |
| <b>KEKUEWA</b> 2:17   | 113:10,17 122:1     | 36:2 46:8 48:8    | 257:17 258:11,20  | 400:3                  |
| Kennedy 2:17 4:5      | 133:2 136:1 145:4   | 49:19 52:11 55:13 | 259:6,16 261:12   | knowing 255:2,3        |
| 9:18,20 10:1,7        | 156:7 158:4,17      | 55:14 56:2,12,18  | 263:4,19 266:7,10 | 336:9 353:14           |
| 13:6 31:13,14         | 159:2 160:16        | 56:19 57:11,15    | 266:11 268:2      | knowledge 149:13       |
| 37:3,7 46:2,5         | 170:8 171:15        | 61:18 62:2,8      | 270:3,17 272:1    | 188:16                 |
| 51:22 52:16,19        | 173:17 179:15       | 63:12,14,18 64:10 | 279:3 284:8 287:6 | known 8:8 112:19       |
| 54:5,10,17 56:21      | 180:15 185:1        | 64:11,13 68:8,9   | 289:7,10,20       | 192:5 207:22           |
| 57:3 58:12,22         | 199:14 206:15       | 70:7,21 72:1      | 292:10 294:14     | 234:18 390:13          |
| 59:6,22 60:20         | 236:7 237:5 238:2   | 76:16 84:14 87:16 | 295:12,20 296:3,5 | knows 175:22           |
| 61:4,15,21 62:5       | 239:16 240:9        | 92:12,21 94:3,17  | 296:10,11,18      | 179:19 323:21          |
| 66:14 71:16,19        | 241:8 242:3 245:9   | 94:19,21 95:7     | 297:10,12,14      | 347:7 373:2            |
| 88:22 103:13          | 247:12 248:3,20     | 96:9 98:20 99:16  | 301:11 302:5      | know-all 66:19         |
| 104:17 111:11         | 250:12,15 254:9     | 100:8 101:6 103:9 | 303:14,17,22      | <b>komo</b> 13:8       |
| 113:3 119:8           | 257:17 260:5        | 105:14 106:10,11  | 304:5,18,19 305:3 | Kona 1:15 20:9         |
| 122:18 143:13         | 262:8,15 264:6      | 106:14 108:2      | 305:6 306:15,16   | 339:1                  |
| 156:17 157:3          | 265:4,18,22 266:7   | 109:15 111:17     | 307:14 308:7,18   | Kong 294:10            |
| 158:10 160:13         | 266:11 287:3        | 115:20 121:10,17  | 308:20 309:1      | Kotzebue 45:19,22      |
| 162:3,8,12,15         | 295:1 299:5         | 124:5 126:13      | 310:3 311:7,15    | 46:1                   |
| 186:20 258:8          | 324:14 326:22       | 127:7,8,14 132:22 | 313:4 315:17      | KRISTINA 2:17          |
| Kennedy's 85:8        | 331:2 332:15,15     | 133:16 134:6,18   | 316:11 317:18     | <b>Kukui</b> 317:3     |
| kept 149:22 261:7     | 334:14 352:17       | 135:16 136:3      | 319:10,20 320:15  | Kure 371:19            |
| 265:18                | 355:18 357:3,3,22   | 137:4,17 138:3,6  | 321:5,7 324:19    | <b>Kyle</b> 2:23 85:13 |
| <b>KEVIN</b> 2:23     | 366:8,21 373:13     | 138:8 139:17      | 325:15 327:11,13  | 184:21 300:22          |
| <b>key</b> 39:5 44:18 | 373:16 379:2        | 141:9 142:12      | 327:15,18 329:16  | 355:14 400:20          |
| 122:4 123:1 124:6     | 389:20 398:1        | 143:5 147:9,12,21 | 331:21 332:10,14  | Kyle's 309:16          |
| 181:7 231:9 316:5     | 401:3,8             | 149:21 150:5      | 332:19 333:3      |                        |
| 321:7 352:7           | kinds 26:17 47:6    | 151:12,14 152:13  | 334:7 335:12,14   | L                      |
| 401:19                | 112:15 140:2        | 155:14 156:4      | 335:19 336:22     | lab 179:7 262:7        |
| Keynote 4:3           | 198:17 250:4        | 159:4 160:1,20    | 337:2,7,9 340:20  | label 100:14           |
| <b>Keys</b> 251:3     | 372:8               | 161:9,18,20 163:4 | 344:22 345:5,21   | labor 160:19,19        |
| kick 150:2 358:9      | Kings 290:13        | 163:13 164:1      | 346:13 347:1,10   | 161:2                  |
| kids 14:22            | <b>Kirby</b> 343:11 | 168:3 171:2 174:8 | 348:5,5,6,22      | lack 19:14 276:22      |
| killing 166:5         | knee 275:13         | 178:9 183:22      | 349:5 350:22      | Ladies 6:3             |
| kind 9:4 12:20 16:2   | knew 175:4 258:19   | 184:2 185:4 191:5 | 351:22 352:3      | lag 187:19             |
| 17:7,12,21 28:19      | 394:2               | 191:22 194:10     | 356:15 357:20     | Lagoon 348:10          |
| 31:22 32:16 33:3      | knock 23:8          | 195:21 197:15,17  | 359:12,13,15,22   | Lahaina 319:5          |
| 33:6,14 35:2,18       | knocks 363:19       | 197:21,21 198:2   | 360:10,16 362:3   | laid 341:5             |
| 37:8,11,21 38:5       | knot 295:3,4 308:1  | 198:21 200:8      | 363:20 370:6,20   | Lake 257:10 322:7      |
| 38:13,16,20 40:14     | 308:2               | 202:4 203:20      | 375:6 378:11,21   | Lakes 40:3 76:11       |
| 40:20 41:21 42:16     | knots 287:22        | 205:9 216:1       | 378:21 379:19,20  | 182:8,10 222:19        |
| 43:10 45:10 46:22     | 346:15 360:9        | 227:14 228:12     | 379:21 383:1      | 256:15 262:5           |
| 50:4,15 54:13         | know 7:3 8:1 14:17  | 229:5 230:7,14    | 387:12 388:9      | 366:14                 |
| 55:2 57:11 58:2       | 16:13 17:19,20,22   | 232:20 233:22     | 390:17,19 391:13  | Lamb 2:3 4:16          |
|                       |                     |                   |                   |                        |

| r                  |                          |                            |                           | Page 423              |
|--------------------|--------------------------|----------------------------|---------------------------|-----------------------|
| 290:9,10,12        | <b>laws</b> 162:10       | 109:12 242:6               | 258:21 262:12             | limited 128:14        |
| 292:20 293:1       | Lawson 1:20 75:10        | 247:3 248:11,12            | 263:6,7 264:2,20          | limits 92:6           |
| 340:5,16 341:5,8   | 75:12 100:16,17          | 293:13                     | 264:22 267:10             | line 55:4 62:15       |
| 349:22 350:8       | 138:11,12 323:10         | legal 82:17 263:5          | 268:12,16 270:15          | 155:1 177:8 178:9     |
| 356:8 361:14       | 395:8                    | 325:13,21 326:6            | 271:18 359:14             | 201:8 202:11          |
| Lanai 175:12       | lawsuits 205:9           | legislation 67:16          | 370:4,10 371:3            | 224:18 230:15,20      |
| 311:19 313:1       | lawyers 150:14,17        | legislative 23:12          | 402:5                     | 254:19 274:3          |
| 342:16 345:11      | layday 338:20            | 81:12 85:20                | <b>levels</b> 15:13 44:21 | 290:18 384:9          |
| 402:20             | layer 204:21             | legislator 16:6            | 213:9 241:18              | 390:8,14 394:14       |
| land 25:5,12 29:5  | layers 122:8 280:20      | legislators 17:18          | 242:2 248:19              | 400:3                 |
| 82:6 213:10,14,17  | 281:20                   | legislature 16:5           | 249:10 259:14             | lined 284:1           |
| 218:4 290:17       | laying 142:1             | 17:17 26:11                | 268:15                    | lines 37:17 59:16     |
| 346:9 372:2        | lay-up 341:9             | legs 122:13                | leveraged 186:4           | 88:11 108:1           |
| landfall 180:2     | <b>LCDR</b> 2:14         | lends 339:7                | 189:6                     | 253:12 290:17         |
| landlocked 117:1   | lead 47:22 88:4          | length 52:5 216:20         | liability 325:13,18       | 318:19                |
| 117:15,16          | 188:14 212:2             | 289:10                     | 325:19 327:15             | link 192:10           |
| lands 82:18        | 231:13                   | lens 236:9                 | Liana 338:22              | Linking 198:20        |
| land-based 221:19  |                          | Leraand 2:18,18            | licenses 338:4            | links 187:3           |
| language 341:19    | leader 26:18,19<br>83:21 | <b>letter</b> 127:19 129:5 | LIDAR 220:6,16            | list 95:3,7,8 100:4   |
| large 29:12 42:22  | leaders 19:4 93:9        | 129:16 135:7               | 373:20 375:7,20           | 144:5 147:13          |
| 69:16 101:18       | 137:20 397:14            | 129.10 133.7<br>187:16     | <b>LIDR</b> 197:2 380:4   | 193:10 315:10         |
| 118:9 140:16       | leadership 6:11          | letters 384:18             | 380:14,15                 | 318:2,3 373:22        |
| 182:14 258:20      | 14:16 93:10              | letting 244:21             | <b>Lieutenant</b> 6:22    | listed 39:5 100:2     |
| 283:16 335:11      | 100:12 110:20            | let's 6:4 9:21 10:15       | 11:13,14 19:17            | 193:22                |
| 336:5,6 337:18     | 115:8 129:14             | 35:8 37:10,17,18           | 20:3 30:15 31:18          | listen 112:6 125:18   |
| 338:2 388:22       | 399:17                   | 37:20 56:11 61:9           | 85:13 300:18,22           | listening 114:17      |
| 392:17             | leading 56:22            | 66:9 72:14 101:19          | 313:14,15,16              | 116:14 133:1          |
| larger 49:10 97:21 | 283:15                   | 116:1,7 119:1              | 316:6 321:19              | listing 318:4         |
| 257:7 281:19       | leads 112:4              | 124:13 177:4               | 323:9 324:3 325:3         | literally 122:11      |
| largest 101:17     | lean 8:2                 | 206:21 209:20              | 325:10,15 326:10          | 203:3 246:5           |
| 248:10 254:15      | learn 133:12             | 216:21 234:16              | 326:12 327:1              | little 7:16 8:22 16:1 |
| Larry 86:17 112:13 |                          | 274:7 276:17               | 329:13 333:8              | 18:7 20:8 25:13       |
| lasted 130:2       | 133:13,18 310:17         | 313:13 327:21              | 359:10,18 397:16          | 30:20 31:10 32:16     |
| lastly 211:5 213:4 | learning 43:6            | 371:8                      | life 152:18 304:2         | 32:22 36:1 40:8       |
| late 134:4 292:8   | 256:11                   | level 15:9 17:14           | 337:2 372:12,14           | 43:15 72:3,10,10      |
| 305:8 403:1        | lease 99:2               | 18:5 21:18,19              | lifetime 304:1            | 75:17 78:2 87:16      |
| lately 10:9        | leave 106:18             | 26:4,6 27:3,17             | lift 280:20               | 87:18 88:14 94:7      |
| latest 49:20 57:8  | 171:15 174:13            | 28:17,22 29:2              | lifted 242:1              | 95:1 99:3 102:6       |
| 209:19 212:6       | 192:17 278:6             | 45:14 70:12 74:15          | lifting 181:17            | 103:5 120:14          |
| latitude 209:5     | 280:7 312:5              | 78:6 105:9 106:12          | light 239:9 348:11        | 121:1,21 122:19       |
| 214:14             | 321:20 350:11,13         | 106:16 114:19              | 364:5                     | 125:15,20 127:22      |
| launch 287:1       | 350:16 382:9             | 134:2 147:5 166:8          | lighter 185:1             | 129:6 138:8 139:2     |
| 328:15,19 329:1,2  | leaves 44:1,3            | 213:7,13,18                | lights 312:21             | 129.0 138.8 139.2     |
| launches 141:18    | leaving 146:20           | 225:13 235:17              | liked 33:6 310:15         | 161:8 163:20          |
| Laura 2:15 368:2,6 | 350:21                   | 241:3 244:3,5,13           | limit 125:6 168:20        | 171:13 180:3          |
| law 9:15 65:2      | left 30:21 39:1,5        | 244:15,19,19               | 287:21                    | 184:9 193:7 197:5     |
| 166:12             | 43:14 45:17              | 244.13,19,19               | limitations 124:21        | 209:9 219:12          |
| 100.12             | TJ.17 TJ.17              | 271.1 <i>3 233.2</i> 0     | 111111110115 124.21       | 207.7 217.12          |
|                    | I                        | I                          | I                         | I                     |

| 224.16 226.2                  | 360:1               | 214:15              | 380:1               | 277:4 279:13                    |
|-------------------------------|---------------------|---------------------|---------------------|---------------------------------|
| 224:16 226:3<br>229:12 233:21 | locally 61:20 321:6 | long-term 27:17     | Los 292:20          | 281:3,4 282:13                  |
| 238:11 242:9                  | 328:7 329:15        | 88:7                | lose 133:22 134:3   | 281.3,4 282.13<br>284:17 286:17 |
| 250:18 251:5                  | 331:18 353:13       | look 16:12 39:12,13 | 163:2 308:1         | 284:17 280:17 288:10,20 289:11  |
| 257:7 265:18                  | located 7:14 74:8   | 45:2 46:19 47:5     | loses 295:3         | 296:9,17,22 302:6               |
| 269:12 274:6                  | 130:12              | 52:9 57:4,11        | losing 131:6 156:5  | 302:16 308:2                    |
| 276:7 278:12                  | locating 161:22     | 59:13,17 74:2       | 168:10              | 310:11,15,17                    |
| 285:1,17 291:2,22             | 182:15              | 78:1 79:13 88:1     | loss 22:19 131:4    | 311:3,6,10 312:10               |
| 292:6 296:4                   | location 13:22 72:9 | 94:9 113:11,21,22   | 141:16 167:20       | 312:13 313:5                    |
| 292:0 290:4                   | 115:18 152:21       | 146:14 151:14       | lost 122:7 147:19   | 324:20,21 336:13                |
| 301:12 306:5,10               | 218:8 259:11        | 152:3,7 158:19      | 157:6 183:9,15      | 344:8 345:10,21                 |
| 311:14 322:9                  | 279:9 393:10        | 166:7 180:13        | 188:5               | 351:3 355:9                     |
| 337:4 341:21                  | 399:8               | 200:11,12 204:20    | lot 10:9 18:4 32:13 | 356:19 360:4,14                 |
| 345:8 347:14                  | locations 246:1,10  | 239:17 248:17       | 40:13 44:18 49:18   | 364:10 365:14,22                |
| 348:3 349:2,4                 | 247:3,5,9 285:9     | 249:1 250:19        | 50:8 61:16 63:16    | 366:1,8 371:21,21               |
| 352:10 362:7,22               | 352:1 354:11        | 260:5 276:6         | 68:16 70:16 71:4    | 371:22 376:13                   |
| 362:22 364:4,5                | 360:15 362:4,9      | 283:22 286:9        | 72:18 73:10 74:14   | 379:3 380:18                    |
| 365:9 366:13                  | location-based      | 294:20 299:15       | 74:21 77:11 84:3    | 386:12,19 396:10                |
| 371:10 377:20                 | 152:14              | 302:5,22 308:7      | 84:20 98:4 101:15   | 396:13                          |
| 378:8 392:10,21               | logistics 275:1     | 322:4,10 323:5      | 101:15 104:15       | lots 65:19 149:4                |
| 393:10,14,22                  | <b>London</b> 148:4 | 335:6 346:20        | 105:16 108:20       | 247:15 256:12                   |
| 400:3                         | 254:4               | 358:2 361:2,2,3,4   | 113:11 118:7,11     | 390:17                          |
| littoral 82:16                | long 45:7 48:8      | 361:7,9,10 364:19   | 121:7 128:10        | loud 17:6                       |
| live 12:18 340:15             | 49:19 60:17 61:19   | 373:3 376:12        | 132:15 134:3,4      | love 55:8 62:15                 |
| 382:3                         | 71:14 72:17,18      | 379:17,18           | 148:14 170:10       | 300:14 343:19                   |
| lived 300:13 304:2            | 74:8,14,17 81:14    | looked 17:18 41:7   | 172:3 174:20        | loved 300:15                    |
| livelihoods 132:13            | 97:13 98:8 99:20    | 51:9 60:21 61:19    | 180:7 181:17        | Lowell 2:18 4:10                |
| lives 53:1 132:12             | 99:20 100:10        | 135:20,22 203:22    | 182:18,21 185:6     | 6:20 7:2,5 9:22                 |
| 172:8,21                      | 116:2 143:15        | looking 22:19       | 188:12 189:11       | 10:5 13:6 30:17                 |
| livestock 340:6               | 146:16 154:1,7      | 32:13 45:6,16       | 190:9 191:15        | 30:19 31:4,8                    |
| livid 302:3                   | 157:11 163:5        | 63:22 64:5 66:17    | 198:22 199:18       | 45:19,21 46:3                   |
| Loa 350:3                     | 166:3 175:7 208:1   | 70:20 145:6,12      | 201:20 203:21       | 57:15,19 80:12,13               |
| load 148:19,20                | 244:18 246:8        | 152:11 161:21       | 205:4 206:7 207:9   | 86:3 87:7,10                    |
| 255:7 312:1,1,4               | 263:6 268:16        | 191:4 225:12        | 208:17 210:21       | 130:5 132:6,14                  |
| 312:20 354:16                 | 269:7 270:15        | 228:5 234:3         | 211:19 216:18       | 136:5,8 158:11,12               |
| <b>lobby</b> 275:4,5          | 283:13 292:7,16     | 238:20 244:1,4      | 218:21 219:11       | 158:13,22 159:8                 |
| 402:18                        | 292:18 293:12       | 251:8 262:19        | 230:19,21 233:4     | 162:9,13 174:3,4                |
| local 15:16 18:19             | 294:1 296:16,22     | 268:22 282:14       | 235:14 238:2        | 177:17,19,21                    |
| 62:12 131:2                   | 298:6 308:15        | 283:7 285:8 295:8   | 241:10 243:6        | 178:11,15 179:14                |
| 136:20 146:21                 | 314:5,10,12,13      | 307:11,11 312:21    | 244:18 245:13,19    | 182:5,16 183:5                  |
| 166:7 184:16                  | 315:17 318:2        | 350:4 357:21        | 246:9 247:18        | 192:19 193:20                   |
| 187:19,20 188:7               | 371:18 387:22       | 365:7 373:22        | 249:20,22 250:5     | 196:6,16,20 197:4               |
| 228:16 243:17                 | 399:16              | 376:7,11 377:11     | 256:4,5,6 259:3     | 197:9,20 198:9,14               |
| 263:5 275:12                  | longer 54:2 127:7   | looks 194:9 206:6   | 259:21 260:1        | 201:2 202:15,18                 |
| 286:1 315:21                  | 154:18 247:4,8      | 285:9 286:7         | 261:1,13 262:12     | 202:22 204:4                    |
| 316:9 324:5,7                 | 320:5,16 397:7      | looming 152:14      | 269:3 270:11        | 205:8,15 206:4                  |
| 352:14,15 354:12              | longitude 209:6     | loosey-goosey       | 271:12,19 274:15    | 225:9 333:18                    |
|                               |                     |                     | l                   |                                 |

|                        |                         |                                 |                        | Page 45.                 |
|------------------------|-------------------------|---------------------------------|------------------------|--------------------------|
| 334:17 355:22          | 371:17 391:13           | 389:22                          | 206:2 208:14           | mariner's 318:12         |
| 356:1 357:5,16         | Maine 28:14 82:8        | man 51:2                        | 220:11 224:18          | maritime 12:7,8          |
| 378:19 386:8           | 83:22 124:16            | manage 38:17                    | 226:2 229:10,11        | 18:14,16 49:22           |
| 387:1                  | 128:7 129:15            | manageable 219:12               | 237:10,11,13           | 50:21 75:20 76:1         |
| lower 23:7 45:17       | 130:1 166:8             | managed 164:20                  | 269:21 328:16,18       | 80:2 101:10 179:7        |
| 70:21 126:12,19        | 238:13                  | 173:11 196:8                    | 329:11 370:8           | 245:7 277:8 282:7        |
| low-lying 27:19        | mainland 290:1          | management 2:4                  | 372:17 373:9           | 282:18 299:6,7           |
| Lt 2:4,23 3:10 4:19    | 300:13 340:8            | 2:14 3:12 4:21                  | 374:19 375:5           | 300:1,5 304:11           |
| 13:3 20:21 24:15       | 351:1 382:8             | 14:5,6 63:1 85:18               | 376:10 379:5           | 326:21 331:7             |
| 24:19 25:4 26:8        | maintain 36:11          | 107:16 141:5                    | 388:17,22 394:22       | 351:9 355:8              |
| 27:21 28:20 85:13      | 63:21 120:21            | 184:17 199:9                    | maps 228:10,20         | 356:18                   |
| 326:15                 | 208:11 282:16           | 218:2 261:12                    | 229:2 373:7            | <b>mark</b> 173:4        |
| <b>Lubchenco</b> 40:17 | 328:10 383:4            | 273:3 282:12                    | <b>Marathon</b> 184:19 | marked 164:21            |
| 106:1,4 111:16         | 384:5,5                 | 387:6                           | MARCELLA 2:14          | market 23:2              |
| 112:1,8 115:9,14       | maintained 320:10       | <b>manager</b> 74:4             | Margaret 89:14         | 117:18 169:13            |
| 129:6                  | maintaining 320:5       | 85:15 180:13                    | 90:15 92:22 115:8      | marketplace 170:4        |
| Lubchenco's            | maintenance 49:17       | 186:17 212:3                    | Marianas 382:6         | markets 162:2            |
| 105:11                 | 60:19 61:6 63:4         | 236:17                          | marine 5:14 13:20      | marks 214:2              |
| lump 59:7              | 63:15 64:6,22           | managers 184:11                 | 14:8 15:20 24:8        | <b>Marra</b> 2:19 359:14 |
| lunch 175:10 176:5     | 65:12 67:22 68:19       | managing 28:6                   | 40:1,11,20,22          | 359:15                   |
| 176:11,12,15           | 69:3 71:8 84:9          | mandate 41:14                   | 47:15 73:21 74:1       | marriage 84:8            |
| 308:11 401:2           | 87:13 153:21            | 185:8 208:10                    | 75:16 76:20 80:9       | 318:14                   |
| lunchtime 332:9        | 244:10 352:9,12         | 298:9 385:14                    | 89:17 90:5,8,14        | married 20:7             |
| Lurline 341:4,5        | 353:1                   | 392:12,14                       | 101:8 122:4,8,11       | Marriott 1:15            |
| <b>L.A</b> 292:15      | <b>major</b> 14:12 34:9 | mandated 225:20                 | 122:22 123:5,16        | Marshals 189:17          |
|                        | 36:7 38:16 40:15        | 283:4                           | 124:1,5 140:13         | marshes 84:2             |
| Μ                      | 41:20 42:8 43:18        | maneuverability                 | 141:4 145:7            | Maryland 89:14           |
| <b>M</b> 2:17 4:5      | 45:3 46:6 47:4          | 346:5                           | 199:12 203:17          | Massachusetts            |
| MacDONALD              | 48:12 53:10 98:14       | maneuvered                      | 224:8 252:21           | 238:14                   |
| 2:20                   | 112:11 117:13           | 281:14                          | 260:22 282:7           | <b>master</b> 25:6       |
| machine 70:6,8         | 118:6,10 126:18         | manner 391:9                    | 287:20 288:17          | master/pilot             |
| machines 70:9          | 150:7 179:20            | Manoa 294:2                     | 290:14,15 299:13       | 278:15                   |
| 148:3                  | 304:8 326:20            | manually 214:8                  | 315:12,16 331:13       | <b>match</b> 39:6,14,21  |
| Maersk 87:4,8,9        | 333:8 364:8             | 250:3                           | 331:14,17,22           | 229:19                   |
| 142:20 290:17          | 374:10                  | map 47:10 207:19                | 332:22 334:2,5,15      | matched 98:16            |
| <b>MAGERS</b> 2:19     | <b>majority</b> 69:5    | 211:7 216:16                    | 335:1 369:11           | material 32:2            |
| magic 98:1             | 96:10 288:7             | mapped 42:11                    | 371:1 378:9            | 128:19 205:1             |
| magnified 354:14       | 342:15                  | 126:11 375:3                    | 397:20                 | 389:8                    |
| magnitude 159:2        | majorly 135:22          | mapping 40:3 47:9               | mariner 150:10,15      | math 22:15 296:17        |
| 197:17 287:10          | <b>Makaha</b> 343:20    | 76:16 77:10 79:6                | 160:1 167:2,10         | Matson 2:3 4:17          |
| <b>Mahi</b> 293:21,22  | makers 392:1            | 83:19 98:14                     | 243:17 245:9           | 290:8,18 292:6,15        |
| 340:20,20              | making 18:5 29:20       | 105:13 106:8,8                  | 310:4 347:6            | 294:6 299:10             |
| <b>mai</b> 13:8        | 97:14 100:12            | 108:10,10 121:14                | mariners 235:21        | 306:16 323:15            |
| main 22:9 109:17       | 113:18 123:13           | 121:16 125:22                   | 286:1 288:16           | 340:3,4 341:4            |
| 116:19 245:10          | 128:1 155:19            | 126:12,14,18                    | 316:9,10,15            | 343:3 349:10             |
| 271:5 275:5 286:9      | 159:10 212:10           | 144:12 160:9                    | 318:16 319:10          | 350:12 361:18            |
| 297:17,20 339:16       | 296:10 320:9            | 185:16,16 193:6                 | 324:5,8 383:8          | 400:21                   |
|                        |                         | -,,, -, -, -, -, -, -, -, -, -, | ,                      |                          |
|                        | 1                       | 1                               | 1                      | 1                        |

|                          | -                  |                   |                    |                         |
|--------------------------|--------------------|-------------------|--------------------|-------------------------|
| Matt 78:20 154:9         | meant 174:18,18    | 364:21 393:8      | 361:22 363:5       | 173:10 189:10           |
| 154:11                   | 189:17 360:20      | 400:1,6           | 364:2 365:6,10     | 198:10 217:11           |
| matter 26:22 28:3        | measure 210:16     | member 23:21 24:3 | 366:4 368:12,20    | 222:10 223:2,22         |
| 75:18 116:5 151:9        | 214:1 216:16,19    | 24:6,9,16 25:3,20 | 374:18,22 375:19   | 225:9 279:15            |
| 176:21 188:3             | 221:19 233:1,5,8   | 27:13 28:12 56:8  | 387:5,11 388:9     | 322:11 343:18           |
| 274:9 373:17             | 234:11 244:12      | 56:14 57:2 58:18  | 390:6 391:4        | 345:11 346:6            |
| 403:11                   | 246:13 372:20      | 59:1,19 60:16,21  | 393:20 394:12,20   | 348:9 395:9             |
| matters 19:5,5           | measurements       | 61:14,18,22 64:9  | 395:8 396:12,17    | merchant 290:13         |
| 164:7                    | 15:9,10 221:20     | 68:22 69:11 70:19 | 397:18 401:12      | 290:15,19               |
| <b>MATTHEW</b> 1:19      | 248:19 268:13      | 72:8,13,13,16     | 402:7,22           | mercy 163:11            |
| Maui 248:9 293:19        | 269:7              | 73:4,6,7,18,20    | members 1:18 4:2   | mesasure 233:9          |
| 293:20 339:19            | measures 209:22    | 74:12 75:11 76:6  | 4:6 6:15 8:16 9:2  | message 113:9,10        |
| 342:16 343:14            | 210:7              | 76:19 77:20 82:1  | 9:10 11:10,10      | 114:10,20               |
| 344:2                    | measuring 233:13   | 83:4 100:17 102:9 | 13:7 19:19 31:2    | messages 35:19          |
| <b>Mauna</b> 307:2 350:3 | mechanism 94:11    | 105:7,21 106:5    | 52:4 72:1 78:4     | met 1:15 7:4 93:22      |
| <b>max</b> 148:20        | 193:2 319:8        | 108:2 116:11      | 86:4,6,8,9,13 87:1 | 115:10 130:9            |
| maxes 148:19             | 399:13             | 121:4 122:2       | 87:2,20,21 89:11   | 258:9 272:13            |
| <b>Mayer</b> 86:17       | mechanisms         | 124:15 126:5,21   | 89:11,19,21,22     | meteorological          |
| 204:10                   | 377:12             | 132:10 135:4      | 91:16 92:9 93:3    | 243:11,14               |
| <b>Mayors</b> 21:15      | <b>medium</b> 30:8 | 136:7,9 137:7     | 94:18 105:22       | meter 179:4 248:7       |
| <b>McGovern</b> 164:8    | meet 7:4 9:7 89:6  | 138:12 141:12     | 106:22 119:2       | 248:16 254:7            |
| mean 17:10 19:7          | 92:16 189:13       | 145:4 146:3,8     | 123:1 127:19       | meters 246:11           |
| 22:21 24:11 28:6         | 275:1,2,4 288:18   | 149:19 151:15,18  | 129:18 132:2,4     | 247:1,18 346:16         |
| 29:18 37:7 55:19         | 379:18 402:3,11    | 153:11,15 156:10  | 133:5 138:18       | 360:10                  |
| 64:14,16 97:6,10         | 402:18             | 157:2 160:6 161:6 | 176:14 177:12      | method 269:6            |
| 102:6,16 112:1           | meeting 1:9 4:22   | 162:6 164:3,6,16  | 209:16 211:6       | <b>metric</b> 267:11,13 |
| 121:9 123:14             | 6:13,18 7:9,17 8:7 | 165:9 167:6,12,18 | 236:13,16 389:18   | metrics 201:18          |
| 135:6 139:6 142:4        | 8:10,17 9:1 11:16  | 168:12,18,19      | 390:3,5 398:15     | 224:12 267:10           |
| 142:9,13 145:12          | 19:3 50:20 51:12   | 169:4,8 192:15    | 403:6              | Metrology 330:1         |
| 156:13,14 161:22         | 75:8 77:15 86:14   | 196:2,12,19 197:3 | membership         | 386:4                   |
| 165:16 168:13            | 86:20 87:3 100:5   | 197:16 198:1,13   | 107:19             | Mexico 188:11           |
| 198:16 227:8,19          | 104:21 115:11,15   | 203:11,13 204:11  | <b>memo</b> 374:15 | 234:10 257:5,6          |
| 231:6 263:5 269:6        | 117:12 128:4       | 205:6,14,22       | memorandum         | 281:3 338:11            |
| 307:15 309:12            | 129:19 135:10,17   | 226:14,18,21      | 114:3              | <b>mic</b> 8:2 328:2    |
| 314:19 324:19            | 136:22 166:19      | 227:3,7,14,19     | memories 127:14    | 368:17 381:2,4          |
| 331:14 365:11            | 173:6 252:8,15     | 229:22 231:1,19   | mental 10:22       | MICHAEL 2:20            |
| 375:8,19,22              | 299:21 305:3,4,5   | 231:22 234:6      | mention 87:11,11   | Michele 1:21 28:11      |
| 395:12                   | 313:19 330:21      | 269:16,18 270:2   | 116:15 146:9       | 28:12 83:4 124:14       |
| meaning 262:18           | 332:7,7 333:22     | 271:17 272:1,20   | 159:18 164:7       | 124:15 138:14           |
| meaningful 235:2         | 334:4 356:9 367:7  | 273:7,10,14 274:1 | 191:2 196:8        | 167:17 217:11           |
| means 11:5 30:1          | 400:5              | 275:11 292:16,22  | 212:15 219:19      | 275:13 361:21           |
| 53:4 54:11 55:20         | meetings 9:3,5     | 322:1 323:11      | 289:7,12 315:11    | 390:5 391:2             |
| 111:5 118:14             | 32:22 95:4 102:20  | 324:12 325:8,14   | 360:21             | 393:21                  |
| 140:19 187:6             | 115:7 172:7,10     | 326:8 328:14      | mentioned 14:11    | <b>microcosm</b> 391:7  |
| 190:8 192:20             | 173:16 299:11      | 331:12 332:21     | 33:5,7 39:9 40:2   | microphone 326:14       |
| 237:2 241:13             | 300:16 301:1,3     | 333:2 334:21      | 84:4 90:1,18,18    | microphones 21:11       |
| 285:3 310:7 394:6        | 356:3,8 361:16     | 336:21 350:7      | 91:6 132:15 171:7  | microwave 244:3         |
|                          |                    |                   |                    |                         |
| i                        |                    |                   |                    |                         |
#### 244:11 374:18,22 375:19 160:4 161:12 Modernization monk 337:5 372:8 microwaves 244:12 225:18 226:1 387:5.11 395:8 163:6 169:3 403:3 **mics** 7:16 396:12,17 401:12 208:22 237:18 modernizing **month** 22:16 **middle** 49:10 402:22 257:18 271:3 152:17 190:7 210:15 195:16 234:10 **million** 21:20,21 327:10 362:20 **modify** 187:10 246:5 253:4 273:5 283:17 24:22 57:9,9 78:3 388:11 393:17 363:14 300:16 356:9 296:6 373:18 219:16,22 253:15 missions 34:14 **Mokihana** 293:19 **monthly** 391:14 **midst** 301:22 265:12,12 267:7 143:20 157:1,4 293:21 months 9:10 20:5 **Midway** 258:18 297:2 372:7 375:7 235:15 237:13 **Moku** 1:15 23:6 33:18,18,18 millions 70:22 71:1 Mississippi 76:12 **Molokai** 301:19 53:14,21,21,21 337:3 57:5 89:12 130:3 mid-1990s 278:22 133:21 152:16 188:9 322:6 302:6.13 342:16 **mind** 103:22 **Mike** 81:19 231:12 **Missouri** 76:12 345:14 349:16 188:1 265:8 mitigation 181:10 **Miko** 343:13 157:21 172:6 **Molokini** 307:10 270:18 **mile** 296:2,14,15 173:21 307:1 **mix** 22:12 moment 72:7 85:5 monument 5:15 346:19 minds 104:2 **mixed** 102:17 174:5 315:16 14:8 369:11,14 mind-boggling 370:2 **miles** 169:16 momentum 124:3 370:19 371:11,14 201:19 202:2 136:13 **mixture** 400:2 **Monday** 291:7 374:19 377:17,19 282:9 283:14 **mine** 140:17 Mobile 217:6,7,16 money 22:21 24:18 395:21.22 monument's 371:1 147:13 322:2 217:18 257:9 24:20 26:13 46:15 296:16,20,22 297:18 301:20 388:18 260:15.15 273:8 49:18 58:3 60:10 375:5 307:9 316:21 mineral 44:3 273:12 61:20 63:15 65:8 morning 6:4 16:2 361:6 371:18.18 **mini** 400:18 65:16,21 66:8,9 26:16 27:2 31:18 **mode** 162:14 372:1 **minimum** 287:15 220:15,15 66:17,19 67:6,8 32:16 33:3 75:11 milestones 211:15 287:21 **model** 121:18 67:11,19 68:4,14 76:6 78:20 81:3 212:14 222:8 Minnesota 133:14 125:4 152:1 212:6 85:6 90:19 91:5 68:16 69:18 99:3 268:7 133:16 215:6 212:7,8,9 222:4 106:13 107:9 92:11 102:11 **miliary** 385:10 216:5 232:15,22 240:6 108:8,15,17 109:1 111:15 112:8 **military** 194:15 minus 58:9 130:17 248:1 256:20 109:2 122:15 153:4 174:3 185:5 minute 18:9,11 271:8.10 388:17 257:7 260:2,3,4,7 134:3 150:14 218:14 223:2 **Miller** 1:24 2:4 127:18 233:11,20 312:4,6 334:1 260:7,8 261:17 151:1,2 153:18 4:19 23:21 24:3,6 240:15,16 258:4 262:6 267:19 154:2,5,5 156:5 400:10 24:7,16 25:3 56:8 275:9 402:20 358:1,8 157:4,15,16 Morris 2:21 5:17 56:14,15 57:2 **minutes** 88:15 **modelers** 247:22 162:21 163:4,14 381:1,5,7 385:9 76:19,19 105:7 91:21 92:14 93:8 modeling 125:1 163:18 164:17 386:20 387:4,9,15 106:5 126:21 116:2 170:11 126:16,17 179:9 165:10 166:13 388:15 389:14 141:12,12 156:10 274:7 321:20 245:17 360:1 168:16 243:5 motivated 393:11 346:14 360:6 366:19 254:18 267:4 **motor** 292:11 156:10 157:2 196:2,12,19 197:3 389:17 400:22 models 152:2 212:1 296:17 352:10 **mountain** 346:12 212:5 215:14 **mirrors** 145:16 269:16,18,18 353:1 355:5 **mouse** 246:3 270:2 275:11 mispronounced 217:10 221:20 365:20 377:3 move 7:8,12 9:18 313:14,16 316:6 46:4 224:3 231:8 378:5 380:12,16 32:10 38:9 45:1 **missed** 112:7 238:15,17 243:20 392:3 57:13 58:10 72:5 321:19 323:9 324:3 325:3,10,15 297:11 247:16 255:9,12 **monitor** 218:3 72:21 145:19 326:10 328:12,14 **missing** 130:13 370:9 170:5 182:5 256:4,9,18,22 257:8,12 258:13 206:21 234:16 331:12 332:21 **mission** 91:19 **monitoring** 14:4 258:13 359:20 21:17 212:17 258:22 276:17 333:2 336:21 157:6.7.14.16 158:4,8 159:14,15 359:10,18 368:12 **modern** 296:13 218:8 280:6 282:1

| 287:10                      | 38:11 41:1 48:10     | 328:19 373:6,8            | 139:4 180:18          | 117:20 125:7,9    |
|-----------------------------|----------------------|---------------------------|-----------------------|-------------------|
| <b>moved</b> 79:4 183:19    | 54:12 63:1 76:4      | 380:3 381:15              | 185:22 243:18         | 126:2 128:22      |
| 205:2 247:2                 | 80:19 82:14,20       | 385:13 388:12             | 349:1,3 370:18        | 134:18 137:22     |
| 300:19                      | 83:1,6 84:22         | nav 32:5 35:20            | <b>NAVO</b> 196:14    | 138:8,15 139:12   |
| mover 342:19                | 85:18 89:7 90:19     | 36:10,20 38:15            | NAVOCEANO             | 139:22 140:7      |
| moves 97:3 388:2            | 90:22 91:1 102:9     | 39:7 44:15 45:5           | 196:4 197:19          | 147:6 148:8 149:5 |
| moving 35:16                | 104:13 106:17        | 48:18 54:12 56:16         | 198:5                 | 149:10 151:13     |
| 62:14 63:8 73:14            | 110:19 113:13,14     | 57:5 83:11 114:10         | <b>NAVPACs</b> 316:20 | 155:10,17,22      |
| 145:17 155:1                | 113:22 118:4         | 184:11 186:16             | Navy 2:8,19,21        | 162:7,19 169:19   |
| 182:19 287:13               | 138:17 144:9,18      | 207:5 211:16              | 195:3,5,20,21,21      | 170:5 172:19,20   |
| 289:15 321:10               | 145:10 148:22        | 343:6 352:2               | 196:21 197:22         | 174:19 175:9      |
| 325:22                      | 177:9 193:6,11,13    | naval 278:21 330:1        | 254:4 258:9           | 208:7 209:1       |
| MTS 49:2                    | 194:14 199:11        | navigated 281:13          | 278:19 325:9,10       | 213:16 214:19     |
| multi 328:14                | 206:21 207:4,11      | navigation 2:1,3          | 326:17 331:7          | 217:3 219:1       |
| multiple 47:11              | 207:14,17 208:9      | 4:9,14,17 6:12            | 333:8 381:18,19       | 227:21 230:15     |
| 141:5 233:9                 | 208:12 209:4         | 35:13 50:6 68:11          | 384:2 385:5 386:3     | 231:16,17 235:19  |
| multipurpose                | 210:1,20 211:4,8     | 73:11 78:8 85:14          | 386:12 391:5          | 237:4,18 243:12   |
| 381:20                      | 211:18 214:7         | 85:21 90:21 91:2          | Navy's 254:4          | 243:17 247:17     |
| multitude 195:13            | 216:3,12 218:17      | 91:12 93:16 99:18         | Nawiliwili 349:11     | 253:20 258:5      |
| <b>multi-beam</b> 77:5,7    | 218:18 219:7         | 99:21 100:22              | 361:4                 | 262:22 276:8,10   |
| 141:18 330:10               | 220:12 222:14        | 105:18 111:3              | NCAR 234:8            | 277:1 282:22      |
| multi-year 217:7            | 225:17,22 228:10     | 119:13,18 120:8           | NCCOS 185:14          | 286:12 288:1      |
| 217:15                      | 229:20 231:9         | 120:10,21 122:6           | NCDC 2:19             | 292:17 303:12     |
| municipalities 28:2         | 233:2,3 255:16       | 122:10 125:5,8,16         | NCL 337:18            | 304:22 305:17     |
| Murkowksi 394:20            | 262:13 315:16        | 125:18,21,22              | NDBC 272:5,9          | 311:15 319:19     |
| Myers 171:21                | 327:10 362:18        | 126:13 128:21             | <b>NDIS</b> 190:4     | 326:7 331:6       |
| Myers-Briggs                | 368:8 369:11         | 129:8,21 131:9,21         | near 46:10 155:13     | 334:10 353:18     |
| 171:3                       | 371:1 377:13         | 133:10,15 134:8           | 209:15 236:8          | 366:12 373:5      |
| <b>M/V</b> 183:14           | 378:9 383:19         | 141:6 143:3               | 272:18 275:6          | 374:8 377:10      |
|                             | nationally 32:18     | 152:13,18 164:14          | 295:1                 | 381:2 384:9       |
| N                           | 83:14                | 168:4 170:5 172:5         | nearly 34:7 248:1     | 393:14,22 394:9   |
| name 73:20 78:20            | nationwide 352:14    | 176:3 177:10              | neat 247:12           | 397:13 398:3,8,9  |
| 164:8 290:12                | <b>nation's</b> 78:4 | 180:13 182:3              | necessarily 52:22     | 398:17,22 400:8   |
| 328:3 329:22                | 139:13 211:7         | 185:8 187:1               | 93:2 97:6 140:15      | needed 105:16     |
| 369:8 381:7                 | 370:2 394:7          | 212:21 217:13             | 141:8 217:13          | 108:7,18 109:14   |
| 386:22                      | natural 13:12        | 232:6,14 251:6            | 220:14 222:13         | 134:15 145:14     |
| named 130:3                 | 14:15 25:5 29:7      | 260:18 265:1              | 392:15                | 181:16 207:19     |
| names 207:22                | 182:22 215:10        | 271:3 277:10              | necessary 97:12       | 222:16 235:6,7,8  |
| <b>narrow</b> 144:21        | 369:18 370:13        | 285:2 290:9               | 140:9                 | 338:6 389:10      |
| 389:2                       | <b>nature</b> 238:10 | 313:20 314:19,21          | need 25:8 29:7,8,22   | needing 79:13     |
| nation 35:16 48:16          | nautical 15:8 66:19  | 319:14 320:1,14           | 30:3 41:13 45:14      | needs 14:14 47:17 |
| 117:9 207:16,20             | 68:10 97:12,13       | 320:17 335:2              | 46:18,22 48:17        | 50:1,2 51:12      |
| 209:1 228:4 235:3           | 98:22 169:12,18      | 348:10 387:21             | 50:16 51:13 64:15     | 65:18 99:5 107:8  |
| 382:20<br>national 1:3 4:12 | 179:1 190:17         | 392:16 397:20             | 66:18 71:10 72:6      | 113:9 129:6 145:7 |
| 5:14 6:6 28:13              | 194:13,17 201:19     | <b>navigational</b> 74:17 | 98:22 100:7,15        | 155:3,5 173:5     |
|                             | 212:20 228:22        | 76:13 78:13 101:5         | 101:22 102:4          | 227:11 235:9      |
| 35:12 36:9,15               | 235:7 316:21         | 121:22 138:17             | 104:7 108:6,19        | 250:19 274:16     |
|                             |                      |                           |                       |                   |

|                          |                     | 1                       | 1                 |                          |
|--------------------------|---------------------|-------------------------|-------------------|--------------------------|
| 275:13 348:9             | 178:9 184:20        | nine 36:17 39:11        | 199:1,6 204:5     | 2:15 3:17                |
| 373:14 379:18            | 190:9 203:3         | 144:11 193:10,22        | 216:13 221:10     | NOAA/National            |
| negative 139:6           | 207:20 210:16,19    | ninth 144:12,14         | 222:9,10,12 224:6 | 2:9                      |
| negotiated 190:6         | 212:9,16 218:6      | 193:12                  | 230:4,14,14       | NOAA/NGS 2:11            |
| neighbor 278:16          | 220:1,8,17 221:2    | NMFS 378:15             | 237:16 238:22     | <b>NOAA/NOS</b> 2:10     |
| 280:18 288:9             | 221:21 222:3,4      | 398:11                  | 239:8 242:8 243:4 | 2:13                     |
| 291:22 339:5             | 224:21 232:2        | <b>NOAA</b> 1:4 2:15,17 | 255:21 263:22     | <b>NOAA/OCS</b> 2:18     |
| 340:6                    | 236:13 238:15       | 2:19 3:12,14,16         | 264:21 276:2,20   | 2:23                     |
| NERACOOS                 | 239:9 244:16        | 4:5,8,22 6:11           | 276:20 283:8      | <b>nobody's</b> 150:12   |
| 84:17                    | 245:1,22 253:6      | 12:13,17 13:21          | 287:1 300:7 301:7 | 158:17                   |
| NERR 124:16              | 254:3 256:17,22     | 14:2,9 15:4,16          | 303:13 304:16     | nominal 190:18           |
| NERRS 217:17             | 264:5 273:7 284:3   | 32:18 38:3,8,21         | 305:3,5 309:20    | 191:9                    |
| nested 257:8             | 285:14 298:16       | 39:3 40:16,21           | 310:17 314:4,16   | <b>non</b> 120:12        |
| <b>nesting</b> 372:6,9   | 312:15 315:22       | 41:1 43:12 49:1         | 314:17 315:3,12   | <b>nonprofit</b> 78:10   |
| <b>net</b> 22:15         | 322:13 363:2        | 54:14,20 55:1           | 315:19 316:19     | 200:8                    |
| <b>nets</b> 337:6        | 364:14 390:5        | 68:12 77:2,6 79:3       | 317:9,9,17,17     | nonsense 123:6           |
| <b>network</b> 15:16     | 394:5,5 398:15      | 80:9,20,22 81:7         | 320:21 322:15     | <b>nonvoting</b> 86:9,12 |
| 69:21 79:7 82:13         | newer 94:17 291:4   | 85:7 88:5 89:14         | 325:17 328:17     | 87:1                     |
| 82:13 214:16             | news 29:20 30:3     | 90:4,14 93:9            | 331:14,19 332:11  | non-Agency 107:7         |
| 219:13 223:8             | 34:10 40:12,13      | 94:21 95:11,16,21       | 352:10 362:20     | non-coastal 117:22       |
| 233:15 241:4             | 156:20,21 215:7     | 96:8 97:16 98:2         | 367:15,18,19      | non-DoD 194:19           |
| 263:7 264:20             | news/bad 40:12      | 99:3,7 100:8,12         | 368:4 369:7 376:7 | <b>non-Feds</b> 86:6     |
| 272:6,12 351:8           | NGA 194:14 195:1    | 101:1 106:16            | 376:12 377:14     | non-navigation           |
| <b>networks</b> 79:11,14 | 195:8,20 196:10     | 114:2 115:8             | 378:2 381:10,15   | 236:3 257:19             |
| 241:5 351:2              | 197:11,19 198:5     | 116:20 117:7            | 381:19 382:9,14   | non-NGS 215:1            |
| 383:17                   | 227:10 385:17,18    | 121:12 122:20           | 382:16,18,20      | non-stationary           |
| neutral 35:22            | NGA's 195:2,14      | 126:3 129:6,14,20       | 383:10,15 384:1   | 148:16                   |
| never 24:13 98:5         | NGDC 192:6,10,11    | 129:20 130:3,21         | 384:22 385:6,14   | non-traditional          |
| 121:8 194:7 287:6        | 192:17 357:14       | 132:6 133:15            | 385:18,18,19      | 120:11 135:1             |
| 290:16 297:7             | NGS 76:16 212:2,4   | 134:8 136:3 137:9       | 386:2 387:12      | Norfolk 49:6,8           |
| 339:17 382:4             | 217:1 218:10        | 138:19 139:20           | 390:8,15 392:11   | 50:20 188:8              |
| <b>new</b> 4:2 6:14 8:16 | 219:5 225:5 230:4   | 141:15 142:7,21         | 392:16,16 393:1   | <b>normal</b> 98:17      |
| 9:2,9 10:8,10 11:9       | 237:14 376:14       | 144:7,19 148:18         | 393:18 395:3,11   | 158:4,8 159:21           |
| 21:14,14 25:5            | NGSP 89:8 91:19     | 148:21 150:5            | 396:19 399:14,17  | 358:19                   |
| 36:15 38:4 41:8          | nice 20:8 23:5 39:8 | 155:7 156:11,14         | 399:21 403:6      | normally 165:16          |
| 42:7 44:6 48:10          | 84:7 93:9 101:1     | 162:2,18 165:7,8        | NOAA's 6:11 63:6  | 307:4                    |
| 49:10 52:4,8             | 139:2 144:20        | 167:22 168:7            | 63:9 64:4 85:20   | north 79:20 183:9        |
| 63:14 71:22 72:13        | 275:10 307:11       | 169:6 171:11            | 90:21 91:2,12     | 215:6 216:5 231:2        |
| 86:4 87:19 89:11         | 309:5 372:17        | 172:4,9,20,22           | 98:11 110:19,20   | 268:14,20 289:3          |
| 89:18,21 91:15           | 383:12 402:21       | 173:11 175:6            | 119:17,18 123:4   | 297:18 343:19            |
| 97:3,19 105:21           | 403:2               | 176:14 177:8            | 134:1 195:3       | 371:20                   |
| 109:14 113:20            | nicely 39:6,15,21   | 179:22 180:10           | 324:18 352:6      | northeast 42:2           |
| 127:19 132:2             | 47:11 236:4 237:4   | 183:22 185:11           | 368:4 382:2       | 84:17 362:3              |
| 133:4 136:3,11           | night 312:5 347:21  | 189:18,18 191:13        | 387:17 398:18     | northeastern 128:7       |
| 139:21 146:3,5           | nightmare 344:19    | 191:21 194:22           | NOAA/CO-OPS       | <b>northern</b> 221:11   |
| 149:6,7,8 150:11         | Nihue 371:16        | 195:5,8 196:5,15        | 2:13              | 257:5,6 261:2,3          |
| 151:12 155:14            | Niihau 343:13       | 197:12 198:8            | NOAA/HSRP 2:12    | northwest 332:4          |
|                          |                     |                         |                   |                          |

٦

|                            | 1                               | 1                         |                          | 1                          |
|----------------------------|---------------------------------|---------------------------|--------------------------|----------------------------|
| 339:22 370:15              | 266:14 268:1                    | 367:5 390:2 398:7         | 91:1,3 99:17             | 331:14 332:1               |
| 371:16 374:19              | 270:7,9 301:10                  | <b>observe</b> 130:20     | 100:22 102:10            | officer 5:17 75:19         |
| northwestern               | 303:19 333:19                   | 285:14                    | 103:15 104:6             | 78:21 79:3 381:8           |
| 331:17 337:7               | 336:15 338:5                    | <b>observing</b> 84:18,19 | 110:19 113:14,22         | officers 338:3             |
| 369:16 370:3               | 348:11 372:16                   | 85:22 98:3 121:17         | 114:4 123:4              | 394:14                     |
| <b>NOS</b> 2:17 34:22      | <b>numbers</b> 46:20            | 236:22 237:1              | 143:17 144:9             | offices 54:20 85:21        |
| 38:17 77:12 81:10          | 50:9 58:8 70:21                 | 287:19 359:17             | 145:10 177:9             | 178:1 208:2,6              |
| 82:15 85:10                | 101:22 254:16                   | 360:12 362:1,18           | 193:7 203:17             | 211:16 213:5               |
| 121:12 146:12              | 308:13                          | obstacles 128:17          | 273:2 285:11             | 224:19 230:16              |
| 148:21 155:7               | <b>numerous</b> 156:13          | obstruction 322:10        | 289:2,21 294:14          | 390:8,14                   |
| 185:11,14,15               | 156:13                          | obtained 338:5            | 294:17 295:10            | official 6:13,18,20        |
| 239:14 377:14              | NWS 360:21                      | obviously 20:15           | 296:6 298:3,8            | 11:21 62:17 80:15          |
| <b>nose</b> 307:9          |                                 | 57:20 63:19 68:6          | 303:16,20 323:15         | 155:12 176:17              |
| NOSOCRM 83:9               | $\frac{0}{0}$                   | 78:12 95:7 96:15          | 323:17 337:10            | 329:7 333:9                |
| <b>note</b> 31:9           | <b>Oahu</b> 302:13              | 110:14 117:6              | 357:2,9,11 359:16        | 362:19 403:7               |
| <b>noted</b> 167:8 194:12  | 303:19 339:12                   | 119:11 121:20             | 362:18 363:11            | officially 11:6            |
| 195:7                      | 342:9                           | 122:4 141:19              | 372:3                    | 320:22 341:17,22           |
| notes 8:5 303:20           | <b>Oakland</b> 293:21           | 172:4 184:6               | <b>Oceanic</b> 1:3 6:6   | officials 19:2             |
| 334:3 358:2 390:1          | 341:6                           | 188:12 196:20             | oceanographers           | offline 93:22              |
| <b>notice</b> 294:3 311:19 | oath 10:13                      | 209:1 234:2               | 148:13 203:15            | 170:14 222:20              |
| 316:9,14 324:5,7           | <b>Obama</b> 91:8               | 242:21 246:14             | oceanographic            | offloading 185:2           |
| 330:6                      | 109:15                          | 297:16 300:14             | 4:13 81:5 144:18         | offset 61:11 62:14         |
| <b>notices</b> 223:7       | <b>objective</b> 9:8 40:12      | 302:18 358:4              | 144:19 234:18            | offsets 157:16             |
| notification 223:12        | 40:15 43:11 89:7                | 360:17 378:7              | 235:1 381:20             | offshore 140:18            |
| <b>notion</b> 120:9 394:3  | 144:15 206:2                    | 379:12                    | 383:11                   | 257:7 272:7,9              |
| <b>novel</b> 140:3         | 299:12                          | occasional 382:7          | oceanographics           | 283:14 301:14              |
| November 130:2             | <b>objectives</b> 36:17,18      | occasionally 61:8         | 179:10                   | 316:21 357:14              |
| no-brainer 291:1           | 39:1,5,11,11,12                 | 287:9 382:10              | Oceanography             | 397:21 398:6               |
| <b>NRT</b> 327:20          | 39:20 47:4 91:4                 | 383:9 392:7               | 330:2 386:4              | <b>oh</b> 71:16,18 87:8    |
| NRTs 159:18                | 144:11 188:4                    | occupations 12:5          | oceans 41:19 103:2       | 113:7 198:20               |
| 180:18 184:12              | 305:14                          | occur 192:5               | 104:13                   | 262:10 274:21              |
| NSRS 208:13,16             | objects 181:8                   | occurred 132:18           | <b>October</b> 53:2,6,22 | 276:14 326:15              |
| 222:16                     | 389:10                          | 151:6 247:14              | 131:5 201:19             | 327:17 363:13              |
| <b>nuclear</b> 323:21      | obligation 10:22                | 309:13 372:21             | offer 83:2 119:10        | 365:10 374:9               |
| <b>number</b> 6:11,17      | obs 47:13                       | occurs 42:13 86:11        | 119:16 125:19            | 375:7 381:5                |
| 11:18 12:13 33:21          | <b>observation</b> 69:21        | 195:20 247:15             | 384:7 398:19             | 396:17                     |
| 34:6 54:19,21              | 82:12 103:18                    | ocean 2:2,5 4:18,19       | offered 123:9 277:1      | <b>Ohana</b> 3:13          |
| 55:18 59:2,7,15            | 104:11 107:22                   | 12:13 35:12 36:9          | 353:16                   | <b>oil</b> 26:22 27:1 68:2 |
| 63:19 100:19               | 153:6 241:4                     | 36:15,17 38:2,11          | office 4:9,10 7:6        | 68:5,12,14 98:21           |
| 101:2,7 159:9              | 360:15,22 361:8<br>396:9 398:14 | 39:7,10,13,19,21          | 11:3 63:1 80:13          | 99:1 124:20                |
| 160:12,14 163:19           | observational                   | 40:2,14,17,18             | 83:1 85:15,19            | 156:12,19 183:12           |
| 168:7 169:6                | 112:14                          | 41:1,6,11,13,15           | 92:3 107:16              | 184:8,10,19 185:2          |
| 201:13,15,16               | observations 20:18              | 42:10 43:11 45:6          | 129:13 131:9             | 203:18 204:14,18           |
| 202:3 219:10               | 40:3 99:17 113:2                | 47:4,9 54:12,21           | 154:18 178:17,17         | 205:3 296:11               |
| 240:3 251:12               | 135:2 144:12                    | 63:2 69:21 76:4           | 185:15 195:21            | 336:16                     |
| 255:10 256:20              | 146:20 366:8                    | 82:12,14 84:18            | 207:5 217:15             | okay 10:15 11:5            |
| 260:16 266:1,2,8           | 140.20 300.0                    | 85:18,22 89:7             | 230:20 328:8             | 27:11 31:6,7,14            |
|                            |                                 |                           |                          | 1                          |

Г

|   | 1  | l  | I   | 1  |
|---|--|--|---|--|
| 32:12 33:4 34:18  | 206:14   | 204:7 252:21   | orchestra 161:1   | 140:1  |
| 36:4 37:7 46:2  | older 105:22 291:8   | 255:9  | order 125:10  | outstanding 252:2  |
| 52:16 53:17 55:3  | oldest 73:18   | operated 255:15  | 177:17 197:17   | oven 19:18   |
| 55:18 56:1,6,14   | <b>OMAO</b> 190:6  | 261:16   | 286:14 384:10   | overall 34:6 225:12  |
| 57:7 59:14 69:11  | <b>OMB</b> 55:6 60:2   | operates 377:18  | Oregon 84:4   | overlap 84:20 85:2   |
| 71:18 87:14 88:18   | 63:5   | operating 21:4   | 117:14 121:7  | 196:14,16 197:1  |
| 94:15 105:22  | ombudsman 137:4  | 101:16,18 186:10   | organization 41:2   | 199:8,13 227:20  |
| 116:7 118:21  | onboard 52:8   | 210:1 213:6  | 146:13 200:8  | 381:18 382:2,14  |
| 124:13 126:4  | 123:18 165:14  | 219:14 255:12  | 227:16  | overly 194:3   |
| 143:7 145:3 146:2   | 284:9,20 291:9   | 288:18 370:19  | organizations 43:1  | overseas 382:3   |
| 149:17 157:4  | 309:14 322:20  | operation 70:14  | 50:22 185:10  | oversee 196:5  |
| 171:17 174:1  | 376:13   | 230:5 265:15   | organized 43:8  | oversees 123:3   |
| 175:2,21 176:6,19   | once 47:10 55:5  | 350:1,19 389:4   | 236:19 356:4  | oversight 59:4,20  |
| 177:3,20 178:6,12   | 149:8 193:14,15  | operational 4:12   | organizers 104:6  | 80:9 194:8 278:10  |
| 179:14 183:3,4  | 193:20 219:22  | 81:1,5 234:17  | orientation 125:15  | overview 52:18   |
| 198:21 202:17   | 258:11,11 300:16   | 235:1 256:3  | 236:14 362:12   | 236:13   |
| 206:19 207:4  | 309:11 346:14  | 261:21 365:18  | oriented 363:18   | owned 82:18,19   |
| 226:7 227:7   | 349:12,13,15,16  | operationalized  | 394:22  | <b>Owners</b> 77:22  |
| 234:14,20 239:12  | 356:9  | 262:2  | original 48:15 67:1   | owns 222:11 386:4  |
| 245:7 246:4,21  | ones 156:19 227:4  | operations 94:20   | 67:4,9,13 107:19  | <b>O&amp;M</b> 265:13,17   |
| 249:11,14 252:18  | 256:15 257:4   | 189:5 330:13   | 107:20 110:12   | 266:4 273:21   |
| 255:2 257:14  | 291:5,8 322:13   | operator 327:16  | Originally 79:20  | <b>O-F</b> 4:1 5:8   |
| 260:12 262:3  | one's 312:19   | operators 288:3  | <b>Orleans</b> 184:20   |  |
| 263:1 265:9   | 319:18   | 289:8  | 239:9   | P  |
| 269:14 273:10   | one-hundredth  | opinion 16:3   | oscillations 70:13  | PACFLT 330:1   |
| 274:1,2,11,22   | 153:2  | 361:19   | ostensible 65:22  | <b>Pacific</b> 2:1 4:14  |
| 275:6,20 276:13   | ongoing 187:22   | opportunities 38:1   | ought 28:7 52:14  | 5:19 8:10 12:12  |
| 276:17 290:11   | 232:2  | 48:6 134:21  | 62:10 104:22  | 20:22 85:14 176:3  |
| 293:3 294:20  | <b>online</b> 214:10   | 167:20   | 111:1 115:3 162:4   | 182:4 196:13   |
| 298:1 302:9   | 327:1  | opportunity 9:4  |   |  |
|   | 327:1  | opportunity 9.4  | 164:13 171:9  | 249:8 258:7 259:1  |
| 305:22 306:2  | onslaught 331:22   | 14:1 31:17 32:8  | 164:13 171:9<br>341:17 390:22   | 270:4,7 283:18   |
| 305:22 306:2<br>312:4 313:11  |  |  |   | 270:4,7 283:18<br>317:12 323:15,20   |
|   | onslaught 331:22   | 14:1 31:17 32:8  | 341:17 390:22   | 270:4,7 283:18<br>317:12 323:15,20<br>363:4 365:3 368:5  |
| 312:4 313:11  | <b>onslaught</b> 331:22<br><b>on-site</b> 181:20   | 14:1 31:17 32:8<br>33:9 44:1,2   | 341:17 390:22<br>outcome 131:12   | 270:4,7 283:18<br>317:12 323:15,20<br>363:4 365:3 368:5<br>368:9 376:19  |
| 312:4 313:11<br>321:18 327:21   | onslaught 331:22<br>on-site 181:20<br>on/roll 347:8<br>oomph 99:22<br>open 19:18 61:17   | 14:1 31:17 32:8<br>33:9 44:1,2<br>111:20 112:4   | 341:17 390:22<br>outcome 131:12<br>outlook 188:20   | 270:4,7 283:18<br>317:12 323:15,20<br>363:4 365:3 368:5<br>368:9 376:19<br>381:9 395:16,17   |
| 312:4 313:11<br>321:18 327:21<br>328:12 329:18  | onslaught 331:22<br>on-site 181:20<br>on/roll 347:8<br>oomph 99:22   | 14:1 31:17 32:8<br>33:9 44:1,2<br>111:20 112:4<br>152:12,20 163:2  | 341:17 390:22<br>outcome 131:12<br>outlook 188:20<br>239:21 245:1   | 270:4,7 283:18<br>317:12 323:15,20<br>363:4 365:3 368:5<br>368:9 376:19<br>381:9 395:16,17<br><b>Pacific-centered</b>  |
| 312:4 313:11<br>321:18 327:21<br>328:12 329:18<br>330:17 333:6,15   | onslaught 331:22<br>on-site 181:20<br>on/roll 347:8<br>oomph 99:22<br>open 19:18 61:17   | 14:1 31:17 32:8<br>33:9 44:1,2<br>111:20 112:4<br>152:12,20 163:2<br>192:3 290:2   | 341:17 390:22<br>outcome 131:12<br>outlook 188:20<br>239:21 245:1<br>254:2 257:2  | 270:4,7 283:18<br>317:12 323:15,20<br>363:4 365:3 368:5<br>368:9 376:19<br>381:9 395:16,17<br><b>Pacific-centered</b><br>269:19  |
| 312:4 313:11<br>321:18 327:21<br>328:12 329:18<br>330:17 333:6,15<br>337:12 340:2   | onslaught 331:22<br>on-site 181:20<br>on/roll 347:8<br>oomph 99:22<br>open 19:18 61:17<br>106:18 180:14  | 14:1 31:17 32:8<br>33:9 44:1,2<br>111:20 112:4<br>152:12,20 163:2<br>192:3 290:2<br>310:16 317:12  | 341:17 390:22<br>outcome 131:12<br>outlook 188:20<br>239:21 245:1<br>254:2 257:2<br>260:12 270:3  | 270:4,7 283:18<br>317:12 323:15,20<br>363:4 365:3 368:5<br>368:9 376:19<br>381:9 395:16,17<br><b>Pacific-centered</b><br>269:19<br><b>PacIOOS</b> 364:3,6  |
| 312:4 313:11<br>321:18 327:21<br>328:12 329:18<br>330:17 333:6,15<br>337:12 340:2<br>341:3,7,12,20  | onslaught 331:22<br>on-site 181:20<br>on/roll 347:8<br>oomph 99:22<br>open 19:18 61:17<br>106:18 180:14<br>181:9,14,15 242:7   | 14:1 31:17 32:8<br>33:9 44:1,2<br>111:20 112:4<br>152:12,20 163:2<br>192:3 290:2<br>310:16 317:12<br>330:9 355:6   | 341:17 390:22<br>outcome 131:12<br>outlook 188:20<br>239:21 245:1<br>254:2 257:2<br>260:12 270:3<br>301:11  | 270:4,7 283:18<br>317:12 323:15,20<br>363:4 365:3 368:5<br>368:9 376:19<br>381:9 395:16,17<br><b>Pacific-centered</b><br>269:19<br><b>PacIOOS</b> 364:3,6<br><b>PacIOOS.org</b>  |
| 312:4 313:11<br>321:18 327:21<br>328:12 329:18<br>330:17 333:6,15<br>337:12 340:2<br>341:3,7,12,20<br>349:20 355:20,21  | onslaught 331:22<br>on-site 181:20<br>on/roll 347:8<br>oomph 99:22<br>open 19:18 61:17<br>106:18 180:14<br>181:9,14,15 242:7<br>289:2,21 294:14  | 14:1 31:17 32:8<br>33:9 44:1,2<br>111:20 112:4<br>152:12,20 163:2<br>192:3 290:2<br>310:16 317:12<br>330:9 355:6<br>368:19 369:12  | 341:17 390:22<br>outcome 131:12<br>outlook 188:20<br>239:21 245:1<br>254:2 257:2<br>260:12 270:3<br>301:11<br>outreach 130:8  | 270:4,7 283:18<br>317:12 323:15,20<br>363:4 365:3 368:5<br>368:9 376:19<br>381:9 395:16,17<br><b>Pacific-centered</b><br>269:19<br><b>PacIOOS</b> 364:3,6<br><b>PacIOOS.org</b><br>364:18  |
| 312:4 313:11<br>321:18 327:21<br>328:12 329:18<br>330:17 333:6,15<br>337:12 340:2<br>341:3,7,12,20<br>349:20 355:20,21<br>357:5 366:3 367:1   | onslaught 331:22<br>on-site 181:20<br>on/roll 347:8<br>oomph 99:22<br>open 19:18 61:17<br>106:18 180:14<br>181:9,14,15 242:7<br>289:2,21 294:14<br>294:17 321:16   | 14:1 31:17 32:8<br>33:9 44:1,2<br>111:20 112:4<br>152:12,20 163:2<br>192:3 290:2<br>310:16 317:12<br>330:9 355:6<br>368:19 369:12<br>395:6   | 341:17 390:22<br>outcome 131:12<br>outlook 188:20<br>239:21 245:1<br>254:2 257:2<br>260:12 270:3<br>301:11<br>outreach 130:8<br>131:2 169:19  | 270:4,7 283:18<br>317:12 323:15,20<br>363:4 365:3 368:5<br>368:9 376:19<br>381:9 395:16,17<br><b>Pacific-centered</b><br>269:19<br><b>PacIOOS</b> 364:3,6<br><b>PacIOOS.org</b><br>364:18<br><b>package</b> 132:16   |
| 312:4 313:11<br>321:18 327:21<br>328:12 329:18<br>330:17 333:6,15<br>337:12 340:2<br>341:3,7,12,20<br>349:20 355:20,21<br>357:5 366:3 367:1<br>367:13 368:1,16  | onslaught 331:22<br>on-site 181:20<br>on/roll 347:8<br>oomph 99:22<br>open 19:18 61:17<br>106:18 180:14<br>181:9,14,15 242:7<br>289:2,21 294:14<br>294:17 321:16<br>323:2 327:7  | 14:1 31:17 32:8<br>33:9 44:1,2<br>111:20 112:4<br>152:12,20 163:2<br>192:3 290:2<br>310:16 317:12<br>330:9 355:6<br>368:19 369:12<br>395:6<br><b>opposed</b> 54:14   | 341:17 390:22<br>outcome 131:12<br>outlook 188:20<br>239:21 245:1<br>254:2 257:2<br>260:12 270:3<br>301:11<br>outreach 130:8<br>131:2 169:19<br>173:1 390:16  | 270:4,7 283:18<br>317:12 323:15,20<br>363:4 365:3 368:5<br>368:9 376:19<br>381:9 395:16,17<br><b>Pacific-centered</b><br>269:19<br><b>PacIOOS</b> 364:3,6<br><b>PacIOOS.org</b><br>364:18<br><b>package</b> 132:16<br>390:16,20  |
| 312:4 313:11<br>321:18 327:21<br>328:12 329:18<br>330:17 333:6,15<br>337:12 340:2<br>341:3,7,12,20<br>349:20 355:20,21<br>357:5 366:3 367:1<br>367:13 368:1,16<br>371:7,14 374:17   | onslaught 331:22<br>on-site 181:20<br>on/roll 347:8<br>oomph 99:22<br>open 19:18 61:17<br>106:18 180:14<br>181:9,14,15 242:7<br>289:2,21 294:14<br>294:17 321:16<br>323:2 327:7<br>356:10,16 363:1   | 14:1 31:17 32:8<br>33:9 44:1,2<br>111:20 112:4<br>152:12,20 163:2<br>192:3 290:2<br>310:16 317:12<br>330:9 355:6<br>368:19 369:12<br>395:6<br><b>opposed</b> 54:14<br>123:12 376:18  | 341:17 390:22<br>outcome 131:12<br>outlook 188:20<br>239:21 245:1<br>254:2 257:2<br>260:12 270:3<br>301:11<br>outreach 130:8<br>131:2 169:19<br>173:1 390:16<br>393:2   | 270:4,7 283:18<br>317:12 323:15,20<br>363:4 365:3 368:5<br>368:9 376:19<br>381:9 395:16,17<br><b>Pacific-centered</b><br>269:19<br><b>PacIOOS</b> 364:3,6<br><b>PacIOOS.org</b><br>364:18<br><b>package</b> 132:16<br>390:16,20<br><b>packet</b> 92:3  |
| 312:4 313:11<br>321:18 327:21<br>328:12 329:18<br>330:17 333:6,15<br>337:12 340:2<br>341:3,7,12,20<br>349:20 355:20,21<br>357:5 366:3 367:1<br>367:13 368:1,16<br>371:7,14 374:17<br>374:21 381:5   | onslaught 331:22<br>on-site 181:20<br>on/roll 347:8<br>oomph 99:22<br>open 19:18 61:17<br>106:18 180:14<br>181:9,14,15 242:7<br>289:2,21 294:14<br>294:17 321:16<br>323:2 327:7<br>356:10,16 363:1<br>365:22 366:20  | 14:1 31:17 32:8<br>33:9 44:1,2<br>111:20 112:4<br>152:12,20 163:2<br>192:3 290:2<br>310:16 317:12<br>330:9 355:6<br>368:19 369:12<br>395:6<br><b>opposed</b> 54:14<br>123:12 376:18<br><b>opposite</b> 358:17,18   | 341:17 390:22<br>outcome 131:12<br>outlook 188:20<br>239:21 245:1<br>254:2 257:2<br>260:12 270:3<br>301:11<br>outreach 130:8<br>131:2 169:19<br>173:1 390:16<br>393:2<br>outside 107:6 133:8  | 270:4,7 283:18<br>317:12 323:15,20<br>363:4 365:3 368:5<br>368:9 376:19<br>381:9 395:16,17<br>Pacific-centered<br>269:19<br>PacIOOS 364:3,6<br>PacIOOS.org<br>364:18<br>package 132:16<br>390:16,20<br>packet 92:3<br>PACOM 381:21   |
| 312:4 313:11<br>321:18 327:21<br>328:12 329:18<br>330:17 333:6,15<br>337:12 340:2<br>341:3,7,12,20<br>349:20 355:20,21<br>357:5 366:3 367:1<br>367:13 368:1,16<br>371:7,14 374:17<br>374:21 381:5<br>385:3 387:15   | onslaught 331:22<br>on-site 181:20<br>on/roll 347:8<br>oomph 99:22<br>open 19:18 61:17<br>106:18 180:14<br>181:9,14,15 242:7<br>289:2,21 294:14<br>294:17 321:16<br>323:2 327:7<br>356:10,16 363:1<br>365:22 366:20<br>368:17 403:2  | 14:1 31:17 32:8<br>33:9 44:1,2<br>111:20 112:4<br>152:12,20 163:2<br>192:3 290:2<br>310:16 317:12<br>330:9 355:6<br>368:19 369:12<br>395:6<br><b>opposed</b> 54:14<br>123:12 376:18<br><b>opposite</b> 358:17,18<br><b>OPS</b> 147:11 208:4  | 341:17 390:22<br>outcome 131:12<br>outlook 188:20<br>239:21 245:1<br>254:2 257:2<br>260:12 270:3<br>301:11<br>outreach 130:8<br>131:2 169:19<br>173:1 390:16<br>393:2<br>outside 107:6 133:8<br>173:15 205:17   | 270:4,7 283:18<br>317:12 323:15,20<br>363:4 365:3 368:5<br>368:9 376:19<br>381:9 395:16,17<br>Pacific-centered<br>269:19<br>PacIOOS 364:3,6<br>PacIOOS.org<br>364:18<br>package 132:16<br>390:16,20<br>packet 92:3<br>PACOM 381:21<br>385:16   |
| 312:4 313:11<br>321:18 327:21<br>328:12 329:18<br>330:17 333:6,15<br>337:12 340:2<br>341:3,7,12,20<br>349:20 355:20,21<br>357:5 366:3 367:1<br>367:13 368:1,16<br>371:7,14 374:17<br>374:21 381:5<br>385:3 387:15<br>388:8 389:12                             | onslaught 331:22<br>on-site 181:20<br>on/roll 347:8<br>oomph 99:22<br>open 19:18 61:17<br>106:18 180:14<br>181:9,14,15 242:7<br>289:2,21 294:14<br>294:17 321:16<br>323:2 327:7<br>356:10,16 363:1<br>365:22 366:20<br>368:17 403:2<br>opened 88:22  | 14:1 31:17 32:8<br>33:9 44:1,2<br>111:20 112:4<br>152:12,20 163:2<br>192:3 290:2<br>310:16 317:12<br>330:9 355:6<br>368:19 369:12<br>395:6<br><b>opposed</b> 54:14<br>123:12 376:18<br><b>opposite</b> 358:17,18<br><b>OPS</b> 147:11 208:4<br><b>optimal</b> 165:2  | 341:17 390:22<br>outcome 131:12<br>outlook 188:20<br>239:21 245:1<br>254:2 257:2<br>260:12 270:3<br>301:11<br>outreach 130:8<br>131:2 169:19<br>173:1 390:16<br>393:2<br>outside 107:6 133:8<br>173:15 205:17<br>279:12 287:17                                      | 270:4,7 283:18<br>317:12 323:15,20<br>363:4 365:3 368:5<br>368:9 376:19<br>381:9 395:16,17<br><b>Pacific-centered</b><br>269:19<br><b>PacIOOS</b> 364:3,6<br><b>PacIOOS.org</b><br>364:18<br><b>package</b> 132:16<br>390:16,20<br><b>packet</b> 92:3<br><b>PACOM</b> 381:21<br>385:16<br><b>page</b> 273:18 |
| 312:4 313:11<br>321:18 327:21<br>328:12 329:18<br>330:17 333:6,15<br>337:12 340:2<br>341:3,7,12,20<br>349:20 355:20,21<br>357:5 366:3 367:1<br>367:13 368:1,16<br>371:7,14 374:17<br>374:21 381:5<br>385:3 387:15<br>388:8 389:12<br>401:19 402:6,13          | onslaught 331:22<br>on-site 181:20<br>on/roll 347:8<br>oomph 99:22<br>open 19:18 61:17<br>106:18 180:14<br>181:9,14,15 242:7<br>289:2,21 294:14<br>294:17 321:16<br>323:2 327:7<br>356:10,16 363:1<br>365:22 366:20<br>368:17 403:2<br>opened 88:22<br>opening 63:6 326:2                  | 14:1 31:17 32:8<br>33:9 44:1,2<br>111:20 112:4<br>152:12,20 163:2<br>192:3 290:2<br>310:16 317:12<br>330:9 355:6<br>368:19 369:12<br>395:6<br><b>opposed</b> 54:14<br>123:12 376:18<br><b>opposite</b> 358:17,18<br><b>OPS</b> 147:11 208:4<br><b>optimal</b> 165:2<br><b>optimizing</b> 255:7                         | 341:17 390:22<br>outcome 131:12<br>outlook 188:20<br>239:21 245:1<br>254:2 257:2<br>260:12 270:3<br>301:11<br>outreach 130:8<br>131:2 169:19<br>173:1 390:16<br>393:2<br>outside 107:6 133:8<br>173:15 205:17<br>279:12 287:17<br>307:10 342:8,10                   | 270:4,7 283:18<br>317:12 323:15,20<br>363:4 365:3 368:5<br>368:9 376:19<br>381:9 395:16,17<br>Pacific-centered<br>269:19<br>PacIOOS 364:3,6<br>PacIOOS.org<br>364:18<br>package 132:16<br>390:16,20<br>packet 92:3<br>PACOM 381:21<br>385:16   |
| 312:4 313:11<br>321:18 327:21<br>328:12 329:18<br>330:17 333:6,15<br>337:12 340:2<br>341:3,7,12,20<br>349:20 355:20,21<br>357:5 366:3 367:1<br>367:13 368:1,16<br>371:7,14 374:17<br>374:21 381:5<br>385:3 387:15<br>388:8 389:12<br>401:19 402:6,13<br>403:4 | onslaught 331:22<br>on-site 181:20<br>on/roll 347:8<br>oomph 99:22<br>open 19:18 61:17<br>106:18 180:14<br>181:9,14,15 242:7<br>289:2,21 294:14<br>294:17 321:16<br>323:2 327:7<br>356:10,16 363:1<br>365:22 366:20<br>368:17 403:2<br>opened 88:22<br>opening 63:6 326:2<br>operate 110:8 | 14:1 31:17 32:8<br>33:9 44:1,2<br>111:20 112:4<br>152:12,20 163:2<br>192:3 290:2<br>310:16 317:12<br>330:9 355:6<br>368:19 369:12<br>395:6<br><b>opposed</b> 54:14<br>123:12 376:18<br><b>opposite</b> 358:17,18<br><b>OPS</b> 147:11 208:4<br><b>optimal</b> 165:2<br><b>optimizing</b> 255:7<br><b>option</b> 161:18 | 341:17 390:22<br>outcome 131:12<br>outlook 188:20<br>239:21 245:1<br>254:2 257:2<br>260:12 270:3<br>301:11<br>outreach 130:8<br>131:2 169:19<br>173:1 390:16<br>393:2<br>outside 107:6 133:8<br>173:15 205:17<br>279:12 287:17<br>307:10 342:8,10<br>outsider 365:7 | 270:4,7 283:18<br>317:12 323:15,20<br>363:4 365:3 368:5<br>368:9 376:19<br>381:9 395:16,17<br><b>Pacific-centered</b><br>269:19<br><b>PacIOOS</b> 364:3,6<br><b>PacIOOS.org</b><br>364:18<br><b>package</b> 132:16<br>390:16,20<br><b>packet</b> 92:3<br><b>PACOM</b> 381:21<br>385:16<br><b>page</b> 273:18 |

|                       | 1                         | l                   | 1                         |                          |
|-----------------------|---------------------------|---------------------|---------------------------|--------------------------|
| 165:15 166:15         | panelists 134:13          | 327:5 330:20        | 304:12 335:21             | 146:18 151:11            |
| <b>Panama</b> 49:5,11 | 178:9 277:13              | 354:1 368:17        | 377:14 390:8              | 152:19 163:11            |
| panel 1:6,15 2:1      | 298:16 337:13             | 390:18 397:16       | Pascagoula 257:9          | 175:13 191:5             |
| 4:6,14 6:5,7,16       | 351:18 355:21             | participate 14:1    | pass 69:15 251:4          | 194:19 210:12            |
| 8:11,12,16 11:16      | 367:4                     | 76:15 333:13        | 313:3                     | 214:2 229:1              |
| 11:22 13:7 16:8       | panels 95:11 107:1        | participation 131:3 | passenger 80:3            | 275:12 276:19            |
| 18:16 19:18,20        | 115:16 133:8              | 191:4               | 280:21 281:19             | 277:8 288:17             |
| 24:9 31:2 72:7,12     | 172:12 393:8              | particular 24:11    | 344:14                    | 289:2 299:8,22           |
| 73:3,9,19 74:11       | Panel's 131:1             | 32:3 35:13,20       | passengers 65:5           | 305:3 311:4,12           |
| 75:7 77:16,18         | Papahanaumoku             | 36:9 38:7 40:5      | passing 35:19             | 313:19 316:11            |
| 80:11,16 84:21        | 5:14 14:8 315:16          | 41:15 42:2 56:17    | 175:5 348:17              | 325:2 328:22             |
| 85:8 86:6,8,13,18     | 369:10 371:1              | 94:21 98:18         | path 216:20               | 330:22 346:21            |
| 87:1,19,21 88:6       | paper 167:9 194:22        | 137:18 184:6,18     | <b>PATON</b> 320:2,4,6    | 351:3 352:1,3,7          |
| 89:10,11 91:15        | 194:22 195:1              | 186:4 193:12        | Paul 2:10 62:19,22        | 356:11,18 362:16         |
| 92:8,16,19 93:3       | 202:12,21 203:1           | 213:5 241:6         | 85:17 171:17              | 367:15 368:18            |
| 93:11,16,20 94:13     | 276:4 282:1 318:7         | 259:15 314:12       | 266:15                    | 374:6,8 389:22           |
| 95:4 96:3 99:12       | papers 105:3              | 393:10 399:8        | pay 68:4 112:5            | 390:20 396:21            |
| 100:3,9 103:15        | paperwork 31:10           | 400:4               | 153:15 156:3              | 397:12 399:12,14         |
| 104:5,21 105:9,15     | 275:22                    | particularly 60:5   | 157:19 165:19             | peoples 125:17           |
| 106:14,17,17          | parallel 318:22           | 71:22 94:17 97:4    | 168:16 192:1              | people's 121:7           |
| 107:5,19 109:8,12     | parameters 252:1          | 109:14 139:10       | 313:21 323:1              | 124:19 128:2             |
| 110:7,12 119:2,10     | 252:3 272:7               | 149:3 191:1         | paying 63:18 66:3         | 131:17 132:12            |
| 119:16,19 120:2       | parent 41:2               | 268:14 288:4        | 155:15 166:2,13           | pepper 52:15             |
| 120:13,15,16          | <b>park</b> 191:16 271:11 | 323:9 351:20        | 175:18 273:11             | perceived 123:7          |
| 127:19,22 128:8       | parochial 393:22          | 369:22 390:4        | payments 99:2             | 199:5                    |
| 129:4,11,18 132:2     | parsed 54:20              | 394:10 398:15       | pays 148:18               | percent 22:12,14         |
| 132:4 133:4,10        | Parsons 174:8             | 400:9               | Peacock 132:17            | 22:14,15 100:21          |
| 135:19 137:3          | part 12:12 21:12          | particulars 54:7    | 133:1 135:8               | 101:5,5 126:10           |
| 138:18 141:21         | 22:11 34:17 40:18         | parties 393:16      | 187:16                    | 154:14 155:11,18         |
| 142:17 144:6,21       | 40:21 45:5 48:15          | partly 14:15        | peak 346:15               | 158:7 159:10,11          |
| 145:13 146:4          | 52:3 56:1,3 67:18         | 148:21 149:1        | <b>Pearl</b> 278:19 327:4 | 159:12,14 189:18         |
| 149:21 152:18         | 69:14 70:1,17             | 356:16 396:1        | 330:12                    | 196:7 210:18             |
| 164:6 170:17          | 76:22 78:10 94:21         | partner 14:9 223:6  | <b>people</b> 17:1,13     | 224:22 225:2             |
| 172:9 176:3,13        | 95:22 99:2 102:18         | 254:5,5 273:13,21   | 20:15 23:18 26:6          | 267:13                   |
| 177:5,11,13           | 108:3 109:8 112:7         | 315:12 317:9        | 32:13 42:15 47:18         | percentage 22:20         |
| 204:11 207:7          | 115:19,22 130:4           | 380:12              | 52:8 63:18 64:17          | 210:8                    |
| 209:12,16 211:6       | 144:19 153:14             | partnered 282:6     | 66:3,4,5,21 67:12         | percentile 342:7         |
| 252:15 274:6          | 157:13 158:9              | partners 18:19      | 69:8 74:1 84:13           | perception 197:7         |
| 276:18,18,21          | 159:16,21 162:19          | 27:5 217:17         | 100:5 104:22              | perfectly 21:8           |
| 277:7 322:12          | 167:7 170:9 179:6         | 273:17              | 109:14 112:1              | 245:12                   |
| 351:22 362:21         | 188:14 199:2              | partnership 25:17   | 123:10 124:6              | perform 214:8            |
| 373:21 390:3          | 208:10 209:12             | 243:4 314:5,6       | 126:2 127:14              | 278:18                   |
| 392:6,9,13,20         | 221:11,16 230:14          | 315:19 321:14       | 128:22 129:20             | performance              |
| 393:15 398:19         | 230:17 247:22             | partnerships 83:8   | 130:4 133:8               | 209:22 210:6             |
| 399:9,13 403:5        | 248:2 249:19              | parts 17:4 59:10,11 | 134:16 137:5              | 224:11 255:14            |
| panelist 134:9        | 253:5 261:3 266:9         | 68:20 186:18        | 138:19 139:11,15          | 267:10,11,12             |
| 137:6                 | 274:17 305:14             | 194:2 216:13        | 140:5 141:2               | <b>period</b> 5:10 22:16 |
|                       |                           |                     |                           |                          |

| 38:12 125:13                     | 317:13,16                           | piloting 297:16                                   | Planner 85:9                                  | 300:6 303:9 328:2                               |
|----------------------------------|-------------------------------------|---|---|---|
| 158:2 190:7                      | <b>Ph.D</b> 1:20,21,23,23           | pilots 2:2 4:15 12:7                              | planning 40:1,11                              | 367:7,21 381:3                                  |
| 192:12 193:18                    | 2:19 82:9                           | 18:13 60:17 64:11                                 | 40:20,22 41:5                                 | pleased 77:17                                   |
| 307:17                           | <b>pick</b> 22:16 246:13            | 72:17 128:7 135:5                                 | 47:15,16 56:18                                | pleasure 76:17                                  |
| periodically 367:14              | 247:19 315:17                       | 146:21 246:7                                      | 79:6 81:12 89:5                               | <b>plenty</b> 47:21                             |
| periods 281:6                    | 402:5                               | 277:18,22 278:18                                  | 92:12 122:4,8,12                              | <b>plow</b> 133:15                              |
| peripherally 86:18               | picked 240:10                       | 280:13,18 281:9                                   | 123:1,5,16 124:2                              | plug 26:1 366:5                                 |
| <b>Perkins</b> 1:25 76:6,7       | 247:2 309:16                        | 282:17,19 285:10                                  | 124:5 140:14                                  | <b>plus</b> 130:17 179:4                        |
| 151:15,18,18                     | picking 273:21                      | 299:9   | 141:4 143:20                                  | 208:22  |
| 153:15 168:12,12                 | <b>picks</b> 8:2                    | <b>pilot's</b> 282:12                             | 145:8 162:20                                  | podded 281:17                                   |
| 168:19 169:8                     | <b>picture</b> 136:19               | <b>pitch</b> 33:2 50:16                           | 163:3,6 167:4                                 | <b>Podoski</b> 2:22 328:3                       |
| 229:22 230:1                     | 137:8,14 138:10                     | place 21:11 41:9                                  | 175:13 209:14                                 | 328:4 363:22                                    |
| 231:1,19                         | 172:13 181:6                        | 42:12 44:20 45:11                                 | 224:8 238:3 255:6                             | 364:1   |
| permits 12:21                    | 342:3                               | 46:20 49:15 68:13                                 | 274:17 332:11                                 | point 22:20 55:6                                |
| person 29:1 90:15                | <b>pictures</b> 215:16              | 68:15 99:22 114:4                                 | 355:8   | 64:3 86:5 88:3,13                               |
| 300:12 305:5                     | 337:3                               | 116:3 169:6                                       | plans 20:20 24:10                             | 88:14,21 90:1,17                                |
| 316:5 320:5,7                    | <b>piece</b> 219:13                 | 171:21 213:12,13                                  | 24:17 36:19                                   | 91:14 92:17,20                                  |
| 329:2 332:10                     | piecemeal 373:16                    | 214:11 240:10                                     | 113:13 144:14                                 | 107:8 113:17,18                                 |
| 333:19 369:7                     | 375:9,17,18                         | 242:19 247:13,19                                  | 145:11,18 177:6                               | 121:21 122:16                                   |
| personal 103:19                  | 378:14                              | 251:9 260:11                                      | 187:6 193:8,19                                | 127:2 128:1 137:5                               |
| personally 97:9                  | <b>pieces</b> 103:17 276:3          | 262:4 275:7                                       | 196:21 221:15                                 | 147:2 152:22                                    |
| 112:2 335:7                      | 337:5                               | 295:14 319:8                                      | 259:3 271:1                                   | 159:3,15 160:3                                  |
| personnel 4:22                   | <b>pier</b> 241:21 244:12           | 335:18 336:12                                     | 274:18 308:9                                  | 162:1 168:13                                    |
| 370:17                           | 328:17 339:16                       | 357:21 372:13                                     | 322:14 395:15                                 | 179:5 202:5,9                                   |
| persons 400:19                   | 347:11 348:16                       | 380:10 397:21                                     | plant 313:22                                  | 214:15 249:16                                   |
| perspective 102:14               | 350:18                              | 400:14  | <b>plants</b> 343:12                          | 253:9 266:11                                    |
| 119:17 154:15                    | <b>piers</b> 286:5                  | places 122:14                                     | <b>plastic</b> 337:1,5,10                     | 290:13 294:3                                    |
| 207:12 231:7                     | <b>pier's</b> 242:3                 | 222:12 258:19                                     | plate 155:9 200:22                            | 303:1 308:21                                    |
| perspectives 120:3               | <b>pig</b> 340:15                   | 261:20 270:12                                     | platform 242:5,13                             | 341:1 347:14                                    |
| petroleum 42:12                  | <b>pigs</b> 340:14                  | 369:19 383:6                                      | 242:13 245:4                                  | 368:16 379:12                                   |
| 44:4 343:3                       | <b>pile</b> 66:16 242:5,13          | <b>placing</b> 362:4                              | play 34:2 51:17                               | 388:4   |
| phase 181:10                     | 245:4                               | plan 27:6 28:4,7,9                                | 91:2 95:11 102:19                             | <b>pointed</b> 126:9                            |
| phenomena 139:21                 | <b>piles</b> 242:14                 | 38:5,5 45:10,17                                   | 124:22  | pointman 85:15                                  |
| 148:12                           | <b>piling</b> 66:1                  | 89:8 114:2 123:20                                 | player 41:4                                   | points 89:19                                    |
| Philippines 303:21               | <b>pilot</b> 73:8,8 164:6           | 144:10 186:21                                     | players 113:19                                | 111:14 119:8                                    |
| philosophy 131:13                | 240:18 278:20                       | 187:9 193:5,15                                    | playing 85:11                                 | 139:9 158:15                                    |
| <b>phone</b> 164:11,12,14        | 279:11,22 280:4                     | 270:9 336:11                                      | 188:13<br>Plays 15:4                          | 229:6   |
| 361:3<br>nhonos 346:22           | 282:14 286:6<br>289:9 303:6 309:2   | 388:1<br>nlana 150:8 275:21                       | plays 15:4                                    | <b>poke</b> 307:9                               |
| phones 346:22<br>photogrammetric | 289:9 303:6 309:2<br>322:6,9 325:19 | <b>plane</b> 150:8 375:21<br><b>planes</b> 221:10 | <b>plead</b> 146:5<br><b>pleasant</b> 275:10  | <b>polar</b> 75:21 76:1<br><b>POLHEMUS</b> 2:22 |
| 240:3                            | ,                                   | -   | -   |   |
| <b>phrase</b> 155:20             | 333:22 337:19,20<br>338:14,17       | planet 369:19<br>planet's 371:5                   | <b>please</b> 9:16 19:20<br>40:9 102:8 103:11 | <b>police</b> 187:20<br><b>policies</b> 99:22   |
| 234:22                           | <b>pilotage</b> 278:6               | planned 45:18                                     | 185:3 186:7                                   | policy 5:12 18:5                                |
| <b>physical</b> 66:10            | 283:12 337:17                       | 46:10 184:19                                      | 188:19 194:1                                  | 27:19 36:15,17                                  |
| 97:17 179:9 235:1                | 338:7 339:1                         | 216:8 238:4 240:3                                 | 198:19 201:3                                  | 38:2 39:10,13,22                                |
| 320:19 371:11                    | <b>piloted</b> 278:1,19             | 251:2 270:6                                       | 292:4,12 294:19                               | 40:17 47:5 66:20                                |
| <b>physically</b> 315:3,12       | 279:1 292:14                        | 271:14  | 292.4,12 294.19<br>296:8 298:22               | 40.17 47.3 00.20<br>75:14 76:4 85:19            |
| physicany 515.5,12               | 217.1 272.14                        | <i>4</i> /1.1 <del>4</del>                        | 270.0 270.22                                  | 13.14 10.4 03.19                                |
|                                  | -                                   |   | -   | I   |

|                           |                           |                           |  | Page 440           |
|---------------------------|---------------------------|---------------------------|--|--------------------|
| 89:7 91:2 98:6            | portal 224:9              | positions 215:1           | 125:12 134:2                           | 201:11 266:9,12    |
| 99:19 102:10              | <b>portfolio</b> 257:20   | 222:18                    | 148:5,17 149:7                         | presiding 1:17     |
| 103:15 104:6,13           | 353:9                     | <b>positive</b> 23:9 84:9 | 231:8 234:1 235:8                      | press 118:11 130:9 |
| 113:22 129:7              | <b>portion</b> 277:3      | 300:21,22                 | 235:22 245:11,19                       | 131:2              |
| 137:14 144:9              | <b>Portland</b> 25:21     | <b>possible</b> 97:19     | 246:1,9 249:19,21                      | pressed 362:21     |
| 179:10 193:7,11           | 74:13,16 75:1,9           | 115:14 181:9              | 250:1 251:14                           | presumably 122:14  |
| 193:14 264:6              | 117:12,13 126:5           | 280:5 287:14              | 267:21 358:5,7                         | pretty 18:2 34:13  |
| 369:10 392:1              | 148:20 166:19             | 321:10 331:1              | preference 385:8                       | 34:22 39:6,19      |
| <b>policymaker</b> 17:8   | 252:8 328:7               | 351:19 356:18             | preferred 289:1                        | 43:19 55:2,10      |
| <b>Policy's</b> 145:11    | <b>ports</b> 49:9,15 50:1 | 357:19 358:3              | premium 179:3                          | 58:16 104:4        |
| <b>political</b> 16:18    | 62:1 64:4,5,10            | 370:4 379:19              | 343:7                                  | 109:17 135:20      |
| 66:12 96:6 109:10         | 65:12 66:10 68:11         |                           |  | 141:15 153:17      |
|                           |                           | <b>possibly</b> 95:5      | <b>prepare</b> 125:10<br>304:17 305:10 |                    |
| 117:3 122:22              | 69:12 71:6 72:21          | 141:20 288:19             |  | 181:9 186:9,22     |
| 123:8,9 393:12            | 73:10,15 76:10            | 312:21 318:21             | 332:18                                 | 193:9 194:5        |
| 396:9                     | 98:2 108:22               | 329:14                    | prepared 268:12                        | 197:14 230:16      |
| politically 302:2         | 117:18,21 118:19          | post-storm 321:3          | 336:20                                 | 232:17 254:10,17   |
| politicos 12:6            | 125:8 181:22              | post-tsunami 248:3        | preparedness                           | 255:4 256:13       |
| polling 391:6             | 211:11,12 251:18          | 286:4                     | 121:11 184:8                           | 257:20 259:16      |
| Pollution 68:3            | 252:1,6 253:6             | pot 58:1 63:6             | preparing 29:15                        | 268:16 271:4       |
| <b>pool</b> 152:9 380:16  | 254:3,14,15,19            | potato 348:18             | <b>presence</b> 71:13                  | 272:3 274:15       |
| poor 147:7 149:8          | 260:16,21 261:5           | potential 26:19           | 188:22 333:7                           | 293:7 295:11       |
| <b>poorly</b> 137:9       | 265:14,15,17              | 219:9 256:10              | present 1:18 2:7,25                    | 305:19 334:4       |
| populated 271:5           | 266:4 267:22              | 323:14 324:6              | 236:6 320:6                            | 351:15 352:6       |
| population 147:1          | 268:2 272:14,16           | potentially 254:20        | 381:22 388:7                           | 355:4 358:19       |
| populations 84:13         | 273:15,18,20              | 370:16                    | presentation 11:22                     | 365:2 374:9 375:2  |
| <b>port</b> 49:14 61:3,18 | 278:2,16,22               | power 42:3 183:9          | 30:18 37:6 71:13                       | prevalent 281:22   |
| 61:20 62:2 66:4,7         | 280:10,15 283:9           | 256:10                    | 88:16 105:2 129:3                      | prevent 29:22      |
| 69:14,15 71:2             | 283:11,15,16              | powerful 380:4            | 132:16 176:5                           | 68:12              |
| 72:20 74:16,22            | 284:6 285:4               | PowerPoint 89:1           | 177:15 268:8                           | preventing 68:15   |
| 84:8 117:12               | 286:16 288:9              | practice 76:9             | 298:20 385:4                           | prevention 68:5    |
| 129:22 148:22             | 290:1 294:12              | <b>pre</b> 334:22         | presentations                          | previous 106:6,21  |
| 161:20 165:19             | 303:1,3 338:19,21         | precarious 345:8          | 87:21 88:2 137:14                      | 113:12,12,13       |
| 168:2,10 181:9            | 339:10 340:1              | <b>precise</b> 70:3,8,13  | 179:15,18 250:5                        | 115:16,16 146:11   |
| 253:14,16 254:6           | 345:13 351:20             | 214:3 232:3,9             | 398:16 399:3                           | 164:6              |
| 257:9 267:17              | 352:19,20 353:22          | 370:18                    | 400:2                                  | previously 100:10  |
| 286:15,21 290:21          | 354:8 383:3 389:9         | precision 72:20           | preserve 120:18                        | price 163:15       |
| 297:16 310:12             | <b>port's</b> 63:11 64:12 | predecessor 146:13        | 279:20                                 | primarily 82:16    |
| 321:5 326:2,4,5           | pose 12:22                | predict 289:20            | preserves 132:12                       | 178:18 207:15      |
| 327:7,13,19               | position 36:11            | predictable 283:19        | preserving 119:20                      | 215:13 220:21      |
| 328:16 330:15             | 44:22 235:7               | predicted 215:16          | 120:5                                  | 264:15 329:10      |
| 338:16 339:14,14          | 356:14 379:13             | 259:17 312:8              | President 26:13                        | 363:10             |
| 339:19 344:2              | positioned 12:12          | predicting 148:3          | 53:8,15 54:16                          | primary 34:14      |
| 345:13,22 346:4           | 208:20                    | prediction 54:1           | 91:8 110:18                            | 36:17 41:4 131:11  |
| 346:18 349:18             | positioning 15:14         | 149:2,11 255:17           | 137:12 277:21                          | 180:19 244:4,14    |
| 350:21 352:2              | 44:21 70:3,9,13           | 268:3 271:21              | 371:15                                 | 342:18             |
| 354:19 355:13             | 210:9 214:10              | predictions 43:17         | presidential 34:20                     | prime 93:13        |
| 356:21 361:3              | 222:3                     | 78:7 113:2 121:15         | President's 35:7                       | <b>PriMO</b> 3:13  |
|                           |                           |                           |  |                    |
|                           | 1                         | 1                         | 1                                      | ·                  |

| <b>Prince</b> 366:17       | 221.6 224.1            | 212.11 229.5             | 201.10 202.2 15           | nuonautios 22.5           |
|----------------------------|------------------------|--------------------------|---------------------------|---------------------------|
|                            | 231:6 234:1            | 212:11 238:5             | 381:19 382:2,15           | properties 22:5           |
| <b>prior</b> 94:4 95:4,11  | 261:15 288:6           | 259:13,13 294:17         | 384:22 386:5              | property 22:3 27:7        |
| 244:7 278:7 284:5          | 298:19 319:8           | 311:1,15 343:6           | 391:20 399:18             | proposal 67:18            |
| 302:19 313:18              | 326:3,6 333:21         | <b>production</b> 194:10 | programmatic              | 110:18                    |
| 325:22 326:2               | 350:19 358:14          | 202:8 220:15             | 257:15 263:1              | propose 39:3              |
| 394:18                     | 363:8 364:3 382:5      | products 4:13            | 265:10                    | proposed 53:8             |
| <b>priorities</b> 39:14    | 387:8 390:22           | 48:20 49:12 81:5         | programmatically          | 267:2                     |
| 50:18 109:6 110:9          | 395:1 400:22           | 83:12 98:10,12           | 261:7                     | proposition 26:15         |
| 113:13 145:7               | problem 8:6 28:9       | 118:10 133:9             | programs 5:12             | 28:21                     |
| 155:1 378:12,14            | 28:17 29:13 54:18      | 187:13 190:22            | 6:12 12:13 26:14          | <b>propulsion</b> 183:15  |
| 378:15,16                  | 65:14 149:2 164:1      | 195:5,10 196:10          | 34:12 63:7,9,14           | 281:17,18                 |
| prioritization             | 191:22 244:6           | 197:14 198:16            | 73:11,15 77:12            | prosperity 15:21          |
| 370:22 374:5               | 271:18 289:8           | 210:4 212:21             | 78:15 80:9 82:11          | protect 371:4             |
| prioritize 206:16          | 303:2 325:12           | 218:12,15 219:5          | 83:15 97:6 123:4          | protected 242:4,7         |
| prioritized 373:22         | 335:2 345:4            | 223:17 234:18            | 143:3 153:22              | protection 15:5           |
| <b>priority</b> 39:11 47:4 | 358:12 365:11          | 236:1,12 237:3           | 198:5 236:17,19           | 101:9,11 102:22           |
| 89:6 91:4 117:8            | 381:16                 | 245:8,16,17              | 241:7 257:16              | 103:7 189:17              |
| 122:5 133:2                | problems 67:8          | 249:18 256:11            | 301:4 302:17              | 370:5 397:21              |
| 144:11,15 193:10           | 111:5 138:7            | 267:15 276:20,21         | 369:10 383:13             | <b>proud</b> 39:15        |
| 211:11,11 252:3            | 157:17 232:5           | 289:15 310:2,6           | 384:6 392:16              | 146:15                    |
| 373:14 375:16              | 302:6 344:6            | 381:11 383:10,11         | <b>progress</b> 200:3,6   | <b>prove</b> 154:21       |
| 383:3                      | 375:20                 | 390:10                   | 212:10                    | proved 243:1              |
| private 6:9 15:18          | problem-solving        | profession 72:12         | project 35:14 70:18       | <b>provide</b> 45:2 46:13 |
| 18:12 22:3,5               | 137:4                  | professional 79:3        | 98:14,19 147:17           | 106:12 120:11             |
| 23:13 27:6 50:21           | procedures 220:8       | 172:8,21 173:2           | 186:3 206:5 217:6         | 154:16,18 162:21          |
| 62:11 69:9 78:9            | proceed 87:17          | professionals 15:16      | 219:19 220:2,22           | 170:18 173:3              |
| 79:22 95:14 96:7           | proceedings 403:7      | Professor 74:13          | 223:18 240:18             | 179:1 183:21              |
| 96:17 97:1 108:16          | process 8:18 58:15     | 82:2                     | 243:8 251:7,10,11         | 208:12 209:8              |
| 108:20 134:21              | 58:20 94:11            | profit 14:21             | 260:14 263:22             | 210:7 212:4,16            |
| 169:19,22 278:6            | 141:16 143:12          | program 14:20            | 360:17 382:12             | 214:1,4,18 217:16         |
| 278:12 314:20              | 170:20 195:19          | 63:11 64:4 65:2          | projected 35:6            | 218:7,16 219:2,21         |
| 320:1,16 324:21            | 205:13 285:18          | 77:3 81:22 83:10         | 163:16 180:1              | 223:7,11 224:6            |
| 325:11 347:15,15           | 310:21                 | 86:15 87:22              | 202:3 242:2               | 228:12,13 229:21          |
| 347:21 348:9,17            | processes 203:7        | 108:22 115:19            | projection 104:1          | 235:15,20 238:2           |
| 398:22 399:12,19           | 378:5                  | 133:6 137:19             | projections 163:12        | 240:19 243:16             |
| privately 82:19            | processing 214:9       | 170:9 191:14             | projects 79:16            | 245:8 249:20              |
| probably 22:18             | 250:12 375:15          | 208:6 211:19             | 238:3,8 239:2             | 251:16,17,19              |
| 34:21 35:3 40:10           | <b>procured</b> 221:21 | 212:3 218:19             | 240:3 366:17              | 258:1 259:8               |
| 42:1 61:5 96:3             | procurement 220:6      | 219:18 225:18            | project's 188:1           | 262:21 263:6              |
| 112:22 115:3               | <b>produce</b> 228:20  | 226:1 236:17             | prominent 351:7           | 265:13 279:10             |
| 136:20 143:10              | 229:4,4 388:11         | 237:8 238:12             | promote 49:3              | 299:11 310:2,3,6          |
| 165:12 166:7               | produced 200:1         | 241:6 251:18             | 138:3,9 310:22            | 311:5,13 314:17           |
| 171:12 179:16              | 385:13                 | 266:22 273:1,15          | <b>promotion</b> 66:20    | 316:8 317:22              |
| 183:7 195:17               | producing 98:12        | 277:3,17 293:3           | 102:12 103:5              | 318:1,21 327:16           |
| 198:3 208:18               | 107:19 117:17          | 310:21 329:11            | <b>prone</b> 180:6 217:22 | 340:1 343:1               |
| 211:5 217:2                | <b>product</b> 22:19   | 365:20,21 368:17         | <b>proper</b> 68:10 186:2 | 353:16 370:5              |
| 225:13 226:4               | 195:22 196:1,7         | 368:18 375:1             | properly 126:11           | 373:21 381:13             |
|                            |                        |                          |                           |                           |

٦

| 294.10 296.14            | 250.2.260.0               | 202.12 202.20        | 21.22 52.12 15        | <b>D</b> omon 97.4     |
|--------------------------|---------------------------|----------------------|-----------------------|------------------------|
| 384:19 386:14            | 250:2 260:9               | 302:12 303:20        | 31:22 52:12,15        | <b>Ramon</b> 87:4      |
| provided 14:3 16:9       | 350:13 365:9              | 308:14 315:2         | 92:9 119:9 205:20     | ramp 389:19            |
| 99:15 185:18             | pulled 86:21              | 316:10 323:12        | 226:8 229:10          | ran 286:6              |
| 212:2 216:18             | <b>pulling</b> 390:21     | 327:8 341:17         | 230:1 231:20          | random 365:13          |
| 252:1 265:17             | <b>pulls</b> 315:3        | 353:20 356:3         | 269:15 277:13         | range 100:10           |
| 266:6 279:1 327:9        | purchase 153:1            | 366:5 370:16         | 290:6 305:20          | 289:20 318:18          |
| 389:8                    | <b>purpose</b> 11:1 39:16 | 380:11 390:9,16      | 321:17 337:13,14      | 348:10,13 382:11       |
| Providence 128:4         | 43:15 65:22 66:8          | puts 263:14          | 356:2 365:22          | 387:22 399:16          |
| provides 26:12           | 67:4,10,20 109:21         | putting 42:9 70:2,4  | 371:9 380:22          | ranges 130:16          |
| 121:12 125:5             | 132:13 137:3              | 162:13 174:14        | 385:2,4 402:13        | 314:20                 |
| 258:3 315:21             | 138:6 153:19              | 255:8 261:4          | quick 9:13 33:7       | ranking 11:21 19:2     |
| 395:6                    | 185:7 209:12              | 271:15               | 86:5 158:14 178:4     | <b>rap</b> 301:10      |
| providing 80:1           | 287:2                     | P-R-O-C-E-E-D        | 181:9 205:22          | <b>rapid</b> 330:15,16 |
| 163:11 229:2             | <b>purposes</b> 67:2,13   | 6:1                  | 262:10 274:12         | rapidly 387:12         |
| 238:8 243:6              | 67:14 69:5 99:7           | <b>P-3</b> 221:10    | 288:13 292:9          | rarely 382:7,12        |
| 277:22 314:16            | 125:9 126:17              | <b>p.m</b> 176:21,22 | 313:18 324:16         | rash 128:15 146:5      |
| 319:18 370:18            | 217:13 273:17             | 177:2 274:9,10       | 329:21 349:7          | <b>Raster</b> 318:10   |
| 399:13                   | 388:17                    | 403:11               | 378:19                | rate 33:13 278:10      |
| provoking 79:11          | <b>pursue</b> 47:10 393:4 |                      | <b>quicker</b> 323:3  | 342:22                 |
| <b>PSC</b> 2:17          | 393:4                     | Q                    | Quicklook 259:13      | <b>rates</b> 23:7      |
| PSC/Pacific 3:12         | pursuing 115:13           | quality 104:15       | quickly 87:12         | <b>rats</b> 18:1       |
| <b>PSSAs</b> 369:21      | 354:1                     | 105:1 186:5          | 130:21 212:15         | <b>rattle</b> 231:13   |
| <b>public</b> 5:10 14:20 | <b>purview</b> 144:8      | quantify 295:20      | 321:10 386:14         | <b>raw</b> 204:1       |
| 18:17 19:2,4 21:3        | 209:8 385:17              | quantifying 97:10    | quite 47:22 68:6      | <b>RCUH</b> 24:8       |
| 21:22 23:15 24:20        | <b>push</b> 7:21 21:12    | quantitative         | 79:16 96:5 99:21      | <b>reach</b> 323:20    |
| 27:7 58:14 97:1          | 48:12 94:14 110:1         | 100:20               | 100:9 183:11          | reached 180:4          |
| 124:18 130:8             | 363:12,13                 | quantitatively       | 194:16 252:20         | reaching 16:19         |
| 134:22 138:22            | <b>pushed</b> 352:5       | 102:5                | 253:10 259:16         | 181:21 378:6           |
| 155:11 177:13            | <b>pushing</b> 64:18 76:4 | question 12:22       | 260:17 278:9          | react 12:22            |
| 192:7 193:18             | 163:21                    | 23:22 26:1,21        | 281:2 294:9           | reaction 119:3         |
| 210:5 214:5,18           | <b>put</b> 92:3,13 98:15  | 27:16 28:3 29:21     | 299:16 306:8          | read 10:1,15,16        |
| 217:1 219:3              | 99:22 102:4 108:5         | 30:7 52:21 54:3      | 331:15 347:9          | 32:2 37:1,4 92:11      |
| 342:20 356:10            | 108:8 111:7 123:5         | 57:1 60:8 96:15      | 363:5                 | 93:8 95:8 112:22       |
| 364:12,22 368:20         | 144:4 165:3               | 96:18 97:16,18       | <b>quo</b> 107:11     | 127:19,20 135:7        |
| 389:16 391:20            | 166:17,22 169:17          | 99:11 101:10         | quote 199:22,22       | 174:16 299:1,2         |
| 392:17 399:20            | 178:1 189:22              | 105:8,20,21          | <b>Q&amp;A</b> 297:22 | 322:18                 |
| publication 250:13       | 200:4 202:13              | 106:12,15 155:4      |                       | readily 364:21         |
| 263:14,16 316:10         | 204:6 207:12              | 156:11 160:6         | R                     | reading 105:10         |
| <b>publish</b> 264:3     | 218:14 241:22             | 197:17 203:12,17     | <b>R</b> 1:25         | 106:5                  |
| published 205:7          | 242:4,22 246:10           | 227:20 269:16,19     | <b>radar</b> 397:22   | readings 258:12,17     |
| 252:5                    | 246:11,13 250:9           | 321:21 323:9         | radars 216:17         | 306:12                 |
| <b>PUC</b> 342:20        | 253:5 256:17,20           | 324:15,16 328:18     | radically 234:12      | reads 248:13           |
| <b>Puerto</b> 87:5 224:3 | 256:22 263:10,14          | 331:10,13 352:8      | radioactive 335:13    | ready 175:10           |
| 240:6                    | 263:16,21 264:5,9         | 352:19 357:7         | raise 10:3,5,12       | 193:14,16 336:9        |
| pull 31:11 48:1          | 264:12,17 268:22          | 370:21 395:14        | 274:19 352:15         | 376:16                 |
| 73:12 75:5 89:20         | 270:5,9,13,21             | questions 19:14,19   | raised 133:2          | Reagan's 137:11        |
| 171:22 249:21            | 271:6 273:3               | 20:2 28:11 29:9      | raising 127:11        | 137:12                 |
|                          |                           |                      |                       |                        |
| L                        |                           | •                    | •                     |                        |

Г

| <b>real</b> 22:21 98:2                              | 284:16 293:5                        | <b>Recognition</b> 137:7               | redundancy 270:14                                  | Rohnauist 326.2                        |
|---|-------------------------------------|--|--|--|
| 124:21 128:3  | 284:16 293:5                        | recognize 88:4                         | redundancy 270:14<br>redundant 270:22              | <b>Rehnquist</b> 326:3<br>reimbursable |
| 124:21 128:3<br>198:10 201:13                       | 302:8 308:4 309:8                   | 116:9 277:12                           | <b>redundant</b> 270:22<br><b>reef</b> 14:5 135:13 | 157:20 230:13                          |
| 233:6,22 251:17                                     | 302:8 308:4 309:8 309:9,15 310:5,15 | recognized 368:22                      | 185:16   | reimburse 230:4                        |
| 270:8 274:12  | , , ,                               | 0                                      | reefs 369:15 372:3                                 |  |
|   | 311:8,14 314:5                      | recognizing 219:1                      |  | reimbursed 156:20                      |
| 344:19 346:3,8,10<br>349:7                          | 317:8,8 319:15                      | recommend 174:15                       | 372:3,11   | 157:11,12                              |
|   | 321:7 332:12                        | <b>recommendation</b><br>129:19 141:21 | <b>reenforce</b> 399:15<br><b>refer</b> 320:2      | reimbursement<br>223:10                |
| realistic 110:14                                    | 344:5 345:17                        | 129:19 141:21                          | reference 82:22                                    | reimburses 24:20                       |
| <b>reality</b> 121:10<br><b>realize</b> 280:5 351:4 | 346:3,3,17 347:17<br>353:18 354:14  |  | 207:17 208:13                                      | reinsert 18:4                          |
| 377:11  | 357:13 364:17                       | recommendations<br>145:2 255:22        | 210:20 213:6,17                                    | reinvent 154:15                        |
| realized 207:18                                     | 374:12 379:12                       | 393:5                                  | 218:19 219:7,14                                    | relate 85:20 245:15                    |
| 237:1   | 387:13,19 389:19                    | recommended 7:11                       | 220:1 229:16                                       | 354:12                                 |
| <b>realizing</b> 148:14                             | 390:19 391:18                       | reconstruction                         | 235:16,16 247:6                                    | <b>related</b> 67:4 74:16              |
| 190:8 223:18  | 395:19                              | 69:19                                  | referenced 186:20                                  | 120:9 209:17                           |
| really 16:19 18:21                                  | realm 126:3 314:19                  | reconvene 176:19                       | 187:17   | 394:10                                 |
| 21:6 30:12 32:7,9                                   | real-time 70:12                     | 177:4                                  | references 213:18                                  | relates 44:10 62:7                     |
| 34:4 35:14 38:17                                    | 79:7,10,10 169:15                   | <b>reconvenes</b> 93:20                | referencing 235:18                                 | relation 172:16                        |
| 39:2,14,17 40:14                                    | 243:16 245:16                       | record 116:5 147:1                     | referred 50:4 80:14                                | 303:18                                 |
| 44:16 45:15 47:17                                   | 251:17,19 258:1                     | 147:8 176:21                           | referring 53:19                                    | relations 131:2                        |
| 48:15 49:3 50:1,7                                   | 259:8 267:22                        | 263:9 270:21                           | 200:11   | relationship 23:3                      |
| 50:9,17 51:6,14                                     | 357:22 359:9                        | 274:9 341:17                           | <b>refine</b> 353:17                               | 213:10 282:16,20                       |
| 55:22 56:1 72:1                                     | 360:5 361:1                         | 403:11                                 | reflectors 204:19                                  | 300:7,10 314:7                         |
| 88:22 89:3 92:4,8                                   | reason 19:1 131:11                  | recorded 248:9                         | refocus 262:20                                     | 377:19 387:2                           |
| 95:16 96:20 98:5                                    | 200:9,10 205:2                      | 249:4                                  | <b>Reform</b> 194:8                                | relative 78:1 96:6                     |
| 98:5 105:18 106:9                                   | 300:11 340:9                        | recording 8:4 92:6                     | regard 321:2 324:6                                 | 214:16                                 |
| 106:11,15 111:20                                    | 378:13                              | 389:21                                 | regarding 381:18                                   | relatively 23:8                        |
| 114:5,19 119:8                                      | reasonable 158:18                   | records 263:10                         | regards 203:16                                     | 104:20                                 |
| 120:16 125:9,12                                     | 159:13                              | recover 23:2,14,15                     | 386:6  | release 30:3 192:4                     |
| 126:8 128:3   | reasonably 241:21                   | recovery 188:10                        | region 180:13                                      | 192:12 222:4                           |
| 134:13 135:19,22                                    | reasons 22:8 44:5                   | 321:3 326:22                           | 368:9 393:10                                       | released 43:12                         |
| 138:7,22 143:2                                      | 147:22 159:5                        | recreation 41:9                        | regional 8:10 84:17                                | 192:6 212:7,9                          |
| 145:18 155:17                                       | 163:19 194:4                        | recreational 78:4                      | 363:2 365:13                                       | 380:14 388:21                          |
| 161:19 171:9  | 200:13 213:3                        | 78:14,16 153:11                        | 368:4  | relevant 15:19                         |
| 182:10 194:7  | rebuilding 69:13                    | 188:11 356:13                          | regions 212:5                                      | 39:19 40:4 83:12                       |
| 197:20 199:1,18                                     | 241:12                              | red 43:3 140:17                        | registered 338:2                                   | 103:17                                 |
| 201:12 202:3  | recall 127:5 330:5                  | 162:7 165:22                           | regular 279:6                                      | <b>reliable</b> 319:14                 |
| 203:6 204:10  | recap 400:16                        | 215:5 231:2                            | 284:10 287:5                                       | <b>relief</b> 273:8                    |
| 215:15 228:4,7                                      | recedes 186:14                      | 246:22                                 | 289:15 340:14                                      | reliefs 341:10                         |
| 230:21 235:9,11                                     | receive 164:5 177:7                 | Redefinition                           | 342:22 356:20                                      | religion 127:17                        |
| 236:3,15,18   | 225:19 272:22                       | 220:20                                 | regularly 395:22                                   | <b>relocate</b> 186:17                 |
| 237:14 241:4  | 342:14                              | reduce 58:5 166:6                      | regulated 200:17                                   | relocation 186:18                      |
| 242:21,22 249:5                                     | received 129:17                     | 238:16                                 | 278:11   | <b>rely</b> 96:16,16                   |
| 250:17 253:3,4                                      | 197:8 261:19                        | reduced 253:11                         | <b>Regulation</b> 273:3                            | 182:20 311:20                          |
| 257:16 258:6  | receivers 79:8                      | reducing 199:3                         | regulations 283:3                                  | 382:16                                 |
| 260:17 267:12                                       | recertified 86:16                   | <b>reduction</b> 266:14                | 312:15   | <b>remain</b> 35:21                    |
| 271:1,14,21   | reciprocal 227:15                   | 267:2                                  | regurgitate 171:6                                  | 225:13                                 |
|   |                                     |  |  |  |

|                           |                           |                      |                            | Page 44                    |
|---------------------------|---------------------------|----------------------|----------------------------|----------------------------|
| remaining 181:11          | 311:22 375:1              | <b>rescue</b> 151:11 | response 68:5              | retired 81:20              |
| 189:22                    | 393:17                    | 152:1                | 121:5 125:11               | 296:19                     |
| remains 124:8,10          | reported 332:8            | research 24:8        | 129:21 131:10              | retrained 278:10           |
| remark 89:9               | <b>reporter</b> 8:3 316:4 | 28:13 76:21,22       | 159:6,16 180:10            | retreat 398:6              |
| 329:22                    | 326:13 381:4,6            | 83:6 140:10 220:7    | 180:19,20 182:3            | retrofitted 256:21         |
| remarked 258:10           | reports 177:7             | 232:2 233:4,5        | 183:21 184:1,8             | return 168:14,22           |
| remarks 4:5 6:21          | 205:11 209:18             | 234:9 262:13         | 215:5,8,12,20              | returned 280:4             |
| 9:12 12:20,22             | 311:18                    | 280:21               | 223:4,5 230:2              | returning 72:13            |
| 89:18 93:1 333:10         | <b>Repository</b> 191:12  | reservation 11:1     | 231:1,10                   | 89:10,22                   |
| 334:18                    | represent 80:4            | reserve 28:13 83:6   | responsibilities           | revamping 288:19           |
| remember 17:15            | 369:14                    | 83:14 262:13,16      | 198:7                      | revenue 169:2              |
| 112:21 137:11             | representative            | reserves 83:7        | responsibility             | revenues 253:15            |
| 182:13 316:1              | 300:12                    | 212:19               | 12:14 40:19                | reverse-engineer           |
| remembering               | representatives           | resident 20:7 23:22  | 146:19 159:17              | 232:19,21                  |
| 183:4                     | 80:7 116:22               | resides 40:22        | 209:3 367:21               | review 1:6,14 6:5          |
| remembers 183:8           | 117:19 120:12             | Resilient 91:17      | responsible 178:18         | 8:11 177:5 384:4           |
| remind 89:10              | 123:2 299:6               | resistance 43:5      | 211:9 320:9                | reviewed 192:18            |
| reminded 392:11           | 393:13 397:8              | resisted 67:7        | 348:19                     | revised 109:7              |
| reminder 9:13             | represented 300:12        | resolution 33:19     | rest 6:17 18:10            | <b>Rhode</b> 128:5         |
| 176:7 402:15              | representing 80:1         | 258:3                | 195:2 214:18               | <b>Rich</b> 51:16 252:9    |
| remote 218:11             | 290:8 330:1 333:7         | resonates 171:11     | 295:1 366:20               | 269:14 353:6               |
| 220:3 223:17              | 390:20                    | resort 1:15 29:8     | 372:2 381:14               | <b>Richard</b> 2:8,13,23   |
| 231:14 270:12             | represents 83:11          | resource 378:17      | restaurants 18:2           | 4:12 81:4 234:16           |
| remove 109:5              | request 100:13            | resourced 383:1      | restoration 74:20          | 329:22                     |
| removed 320:7             | 131:1 216:12              | resources 25:6,18    | 75:2 152:4 188:10          | <b>Rico</b> 87:5 224:4     |
| 389:11                    | 231:3 319:9 371:2         | 29:7 96:17 97:17     | 261:14 262:15              | 240:6                      |
| removing 389:8            | 374:7 386:10              | 142:9 144:1          | restore 84:12              | ridden 313:5               |
| <b>renew</b> 97:18        | requested 70:5            | 161:10 187:9,11      | restoring 83:22            | <b>ride</b> 57:6 275:14,14 |
| <b>renewable</b> 251:7,10 | 252:3                     | 369:18 374:4         | restricted 42:2            | 306:18                     |
| renewed 96:15 98:9        | requests 130:10           | 384:21               | 84:1                       | riding 361:5               |
| renovation 24:17          | 311:6 386:12              | resourcing 384:1     | restriction 43:3           | <b>right</b> 6:22 7:8,14   |
| reopen 151:13             | require 67:15             | respect 16:4 29:6    | restricts 125:17           | 9:11 10:3,5,11,12          |
| 286:15 355:13             | 394:13                    | 29:21 307:20         | restrooms 7:14             | 16:5 18:1 20:9             |
| reopening 321:5           | required 9:15 52:7        | 308:13 310:6         | restructured               | 21:1 22:17 24:15           |
| 326:5                     | 135:13 192:16             | 311:12,16 344:22     | 112:10                     | 25:3 29:5,10 31:5          |
| reorganized 236:10        | 279:6 282:4               | 346:4 349:2          | result 14:14,14,15         | 36:3 42:15 47:18           |
| reorganizing              | 324:18 338:13             | 355:10,11 380:6      | 49:13 131:1                | 47:22 50:20 58:5           |
| 200:14                    | requirement 165:1         | respected 113:6      | 299:20                     | 58:8,11 59:18,22           |
| <b>repair</b> 181:11      | 272:14 384:8              | respectfully 371:2   | <b>results</b> 210:6 214:6 | 60:14,15 61:21             |
| repaired 339:17           | requirements              | respond 100:15       | <b>resume</b> 116:7        | 62:18 63:5 64:11           |
| replacing 69:20           | 236:12 353:17             | 133:3 158:4 184:4    | resumed 116:6              | 69:12 73:11 75:8           |
| replicated 68:19          | 376:10 377:9              | 230:15               | 176:22 274:10              | 106:1 112:1 117:9          |
| report 105:11             | 384:19 385:1,7,10         | responded 130:10     | resurrect 147:6            | 118:3 152:15,20            |
| 106:6,7 109:6,7           | 385:12,21 401:4           | 130:21 184:7         | <b>retail</b> 13:14        | 159:7 163:9 164:9          |
| 109:11 131:3              | requires 286:13           | responders 259:10    | rethinking 35:18           | 164:9,14 167:4             |
| 200:3,10 209:19           | 394:14                    | responding 119:9     | reticence 29:18            | 168:17,18 170:7            |
| 223:19 269:9              | requiring 330:14          | 123:10               | <b>retire</b> 290:16       | 175:9 188:13               |
|                           |                           |                      |                            |                            |
|                           | 1                         | 1                    | 1                          | 1                          |

| 100 1 100 1 6            | 254 10 255 5             | 1140.00                   | 0 (0 10 050 1               | 15 0 50 00               |
|--------------------------|--------------------------|---------------------------|-----------------------------|--------------------------|
| 190:1 193:16             | 254:10 257:5             | round 149:22              | 260:18 278:1                | save 17:2 70:22          |
| 194:16 201:1,2           | 322:6 354:7              | 150:1,1 151:7,8           | 286:4,20 299:15             | 133:21                   |
| 203:22 205:10            | <b>rivers</b> 351:2      | 281:6 297:1 338:6         | safely 44:22 235:6          | saved 282:13             |
| 206:5,6 207:19           | <b>RNC</b> 318:19        | 347:4                     | 253:21 398:8                | saves 17:1,2             |
| 217:2 221:4 226:6        | <b>RNCs</b> 318:10       | route 150:10              | safer 299:14                | savings 16:11            |
| 228:13 234:3             | road 61:12 70:9          | 291:12                    | <b>safety</b> 2:2 4:18 17:1 | 17:17 79:17              |
| 240:14 242:12            | 133:14 169:17            | routes 293:10             | 58:9 74:17 78:12            | <b>saw</b> 165:13 223:12 |
| 244:5 248:11,14          | 264:6                    | 388:18                    | 78:13 101:8,11              | 239:9 260:18             |
| 249:3,12,12              | roadblock 352:13         | routine 159:21            | 103:6 105:17                | 293:9 297:7 335:9        |
| 252:17,20 253:10         | roadblocks 124:11        | 161:3 180:22              | 131:13 170:4                | saying 66:6,22 67:5      |
| 254:2,20 255:3           | roads 182:21             | routinely 278:20          | 185:7 254:8 298:4           | 67:7 97:11 106:13        |
| 258:19 262:8             | <b>Robin</b> 2:2 4:17    | routing 289:1             | 298:8,11 323:13             | 110:3 122:10             |
| 268:11,18 270:1,1        | 298:3 306:1              | <b>Rude</b> 150:4,6,11,20 | 356:20,21                   | 124:5 129:12,13          |
| 272:17 274:2             | 330:19                   | 151:3 154:22              | sail 101:6 203:2            | 129:15 145:21            |
| 276:13 277:20            | <b>Robinson</b> 112:13   | <b>RUDE's</b> 150:19      | sailboat 348:4              | 158:7,9,11 183:1         |
| 289:9 296:1              | 115:11                   | <b>rule</b> 386:13        | sailed 293:14,15            | 259:18 260:8             |
| 299:10 301:17,21         | <b>Robin's</b> 331:13    | <b>rules</b> 166:5 288:19 | sailing 306:6               | 358:14 363:8,13          |
| 306:3,22 307:6           | 333:18                   | <b>run</b> 9:2 48:10 66:4 | 391:21                      | 380:7                    |
| 308:22 311:19            | robust 13:10 79:17       | 68:12 78:14 82:21         | sails 292:10                | says 53:4,17 104:15      |
| 313:15 314:1             | 84:13 256:3 366:6        | 121:15 148:21             | Saipan 196:13               | 106:7 129:18             |
| 318:8 329:2              | <b>robustly</b> 366:10   | 166:3 256:4 260:4         | 329:7 386:21                | 275:3                    |
| 331:11 335:21            | rocks 183:11             | 293:18 296:13             | salmon 74:20,20             | scaffolding 253:9        |
| 341:6,9 342:10           | <b>Roger</b> 174:8 175:4 | 309:17 312:17             | 75:1 84:6,7                 | 253:11                   |
| 347:10 353:10            | <b>Roger's</b> 174:22    | 321:8,9 322:8,21          | 200:16                      | scale 319:15,19          |
| 358:13 360:1             | role 15:3 50:5           | 324:4 325:12,21           | salt 84:2 200:21            | scan 286:8 322:20        |
| 367:2 379:9 382:3        | 51:17 59:4 60:13         | 328:22,22 342:4           | salvage 326:21              | 327:8 388:12,15          |
| 385:11 386:7             | 85:11 89:16 90:13        | 355:2 366:16              | 389:7                       | 389:1                    |
| 389:16 391:14            | 91:3 95:11,15,16         | running 78:8              | salvaging 327:7             | scattering 204:21        |
| RIMELL 2:5               | 95:20 97:21 114:5        | 123:19 136:4,11           | San 87:4 180:22,22          | 204:22 205:1             |
| <b>Rimmel</b> 4:18 292:2 | 139:9 170:22             | 136:17 256:9              | 251:2 252:15                | scenario 57:8            |
| 306:2,4 341:13,18        | 229:8,15 392:8           | 258:13 265:7              | 282:7                       | scenarios 33:21          |
| 342:5 351:11,14          | <b>roles</b> 96:6        | 297:9 340:4 344:4         | sanctuaries 377:18          | scene 140:10             |
| 354:16 358:11,16         | roll 56:20 347:8         | <b>runs</b> 53:2 142:22   | 378:9                       | scenes 52:7 76:5         |
| 359:2,5                  | rolled 257:12            | 283:13 322:6              | sanctuary 14:7              | Schatz 3:10 4:4          |
| ringing 249:8            | 385:21                   | rush 18:6                 | 287:20 302:16               | 11:12 13:3 20:21         |
| rise 27:3,17 28:17       | roller 57:7              | <b>RVs</b> 182:22         | Sanctuary's 375:4           | 24:15,19 25:4            |
| 29:2 78:6 147:5          | <b>Rolling</b> 191:12    | <b>Ryan</b> 2:23 85:13,14 | sand 348:15                 | 26:8 27:21 28:20         |
| 264:22 270:15            | <b>Ronald</b> 137:11     | 300:22 326:12,15          | Santa 180:9 181:5           | schedule 13:9            |
| 370:10                   | room 18:9,11             | 329:13                    | sat 31:21 147:19            | 71:10 132:21             |
| <b>risk</b> 3:12 111:12  | 152:19 176:11            | <b>R2R</b> 191:11,11      | satellite 228:1             | 175:11 182:17            |
| 186:16 206:15            | 218:21 281:14            | 192:20                    | 232:6,14 304:20             | 224:22 255:6             |
| risks 123:15 128:11      | 367:19 402:8             | <u> </u>                  | satellites 139:15           | 274:7 280:14             |
| 128:12                   | <b>Rooney</b> 329:3      |                           | 140:6,12 233:9              | 312:18 389:18            |
| <b>Rita</b> 241:10 322:8 | roots 235:4              | <b>Sabine</b> 69:14       | satisfactory 96:22          | scheduled 189:1          |
| river 75:6,8 117:15      | <b>Rota</b> 329:6        | sad 157:11                | Sause 2:5 4:19              | 190:5 342:22             |
| 148:18 215:5             | rough 353:18             | sadden 175:5              | 292:2 306:17                | 350:13,16                |
| 231:3 252:6 254:9        | rougher 371:22           | safe 130:19 131:12        | 310:14 343:2                | schedules 163:1          |
|                          | l                        |                           | l                           | <u> </u>                 |

| 200.2                      | 041 10 050 14                  | 1 60 15 1 60 10                    | 205 0 205 20                      | (1.10                              |
|----------------------------|--------------------------------|------------------------------------|-----------------------------------|------------------------------------|
| 308:3                      | 341:13 359:14                  | 160:15 169:19                      | 285:8 307:20                      | sensors 64:13                      |
| scheduling 162:20          | 366:13 369:22                  | 170:1 219:3                        | 337:2 354:9                       | 243:12 254:16                      |
| 162:22 343:15              | 370:10 398:5                   | 314:13 326:16                      | 396:21                            | 353:14                             |
| 345:16 349:6               | seabirds 372:7                 | 398:22 399:12,19                   | sees 191:17                       | sent 130:14 328:22                 |
| schemes 206:8              | seafood 14:5                   | sectors 120:11,13                  | segment 152:14                    | sentinel 69:16                     |
| science 15:5 19:4          | seagoing 351:5                 | 141:7                              | segues 236:4                      | 212:18 242:8                       |
| 82:2,4 140:10              | seal 372:8                     | security 102:15,15                 | seismic 258:12                    | 245:2 262:17,17                    |
| 143:20 148:9               | seals 337:5 403:3              | 102:18 223:3                       | selected 370:1                    | 273:8 371:4                        |
| 192:4 205:10               | seamless 318:14                | 226:11 227:22                      | selecting 13:22                   | Sentinels 273:4                    |
| 255:21 376:19              | seaports 267:14                | 355:3,4                            | selection 187:7                   | separate 75:4                      |
| scientific 365:17          | searched 105:12                | see 9:21 13:9 19:19                | selections 127:21                 | 208:6 261:8                        |
| 366:19 391:19              | seas 307:15                    | 37:8,10,20 39:1                    | Selendang 183:8                   | separately 260:6                   |
| scientifically 44:10       | season 128:14                  | 43:14,15 45:9                      | 183:16                            | separating 26:21                   |
| scientist 25:22            | 131:5 163:9 167:9              | 59:18 73:12 86:7                   | Self-contained                    | separation 206:8                   |
| 112:10                     | 259:16,16,19                   | 93:9 99:19 109:19                  | 350:7,8                           | <b>September</b> 53:3,7            |
| scientists 12:6            | 281:8 287:22                   | 117:19 118:8,15                    | self-loading 345:6                | Sequoia 317:5                      |
| 15:17 156:14               | 288:22 330:6                   | 119:2 120:6 129:8                  | sell 113:20 219:1                 | serendipitous                      |
| 191:15 192:9               | seasonable 167:7               | 133:5 139:3 158:9                  | 390:19                            | 120:14                             |
| 363:10,11 364:9            | seasonal 164:20                | 158:10 173:19                      | selves 84:15                      | series 244:19 247:5                |
| 366:16                     | 167:1 169:11,17                | 174:13 176:5                       | semi-annual                       | 248:7 252:7                        |
| scoffed 295:2              | seasonally 173:11              | 201:8 204:1,8,13                   | 173:16                            | serious 191:22                     |
| scope 156:7,8              | season's 131:11                | 204:15 210:22                      | senator 14:16                     | seriously 58:5                     |
| scoped 219:20              | Seattle 294:2                  | 211:2 214:22                       | 55:21 131:18                      | 111:17 147:5                       |
| scoping 218:18             | seaward 382:21                 | 221:9 225:8 226:4                  | 394:19 396:19,20                  | serve 76:18 93:16                  |
| 219:4                      | seaworthy 74:3                 | 236:12 248:13                      | 397:3,5,6,7                       | served 400:14                      |
| Scott 1:25 76:7            | second 22:6 38:3               | 249:1,3,6 258:5                    | Senators 129:15                   | 402:10                             |
| 151:17,18 153:6            | 78:21 90:6,17                  | 258:15 259:20                      | send 55:12 163:5                  | servers 255:13                     |
| 168:12 230:1               | 112:20 126:7                   | 276:9 283:20                       | 175:6 214:5                       | serves 291:21                      |
| scraps 176:18              | 178:13,15 179:2                | 284:1,14 291:10                    | 279:22 282:14                     | service 2:22 4:9                   |
| screaming 346:11           | 202:11 207:5                   | 291:11 294:9                       | 300:17                            | 14:19,20,22 15:1                   |
| screen 308:14<br>398:1     | 210:14 215:3<br>217:19 220:3   | 309:5 315:14                       | sending 29:16                     | 35:12 36:10 38:11                  |
|                            | 222:17 224:20                  | 318:9 319:15                       | 187:4 324:1<br>senior 93:9 106:4  | 39:7,20 40:14                      |
| screens 260:9<br>se 170:12 | 234:21 246:21                  | 341:22 346:12,20                   |                                   | 41:1 45:6 63:2<br>79:15 81:6 82:14 |
| sea 14:18 26:3,6           | 247:2 270:13,21                | 350:2,12,19,21<br>351:16,21 354:10 | 106:10 115:8<br>sense 43:7 107:12 | 85:18 99:20                        |
| 27:3,17 28:17              | 270:22 275:21                  | 354:11 359:22                      | 109:13 139:6,10                   | 110:19 113:15                      |
| 29:2 43:17 44:1,5          | 298:15 360:10                  | 360:11 371:8                       | 140:20 166:2                      | 110.19 113.13                      |
| 57:22 74:15 78:6           | secondary 67:6                 | 382:14 383:12                      | 203:7 223:4 375:9                 | 141:6 143:17                       |
| 85:1 98:14 142:14          | secondly 399:4                 | 388:4 403:8                        | 396:6,10                          | 149:1 151:22                       |
| 147:5 183:10,15            | seconds 233:8,12               | seeing 41:21 122:3                 | sensing 218:12                    | 155:2 163:17,21                    |
| 202:3 213:12               | secretaries 11:19              | 229:3 258:17                       | 220:4 223:17                      | 174:11 177:9                       |
| 263:5,6 264:2,22           | Secretary 113:2                | 294:16 308:13                      | 231:14 252:12                     | 184:3 199:12                       |
| 269:21 270:15              | sector 2:14 6:9                | 350:1                              | sensitive 369:22                  | 214:11 216:12                      |
| 271:18 284:16              | 18:12 23:14,15                 | seek 170:18                        | sensitivity 395:5                 | 230:4 231:4,7,16                   |
| 285:7 290:16,17            | 50:21 62:11 80:1               | seen 8:6 111:18                    | sensor 244:3,5,11                 | 233:3 243:19                       |
| 305:11 310:11,19           | 95:15 96:17 97:1               | 124:8,10 208:18                    | 244:15 252:20                     | 254:19 255:16,18                   |
| 317:9 337:1,2              | 97:2 134:22                    | 268:8 281:11,18                    | 253:2,5,19 267:3                  | 256:9 259:9 260:1                  |
| 511.7 551.1,2              | <i>&gt;1.2</i> 1 <i>3</i> 1.22 | 200.0 201.11,10                    | 200.2,0,17 207.0                  | 200.9 209.9 200.1                  |
|                            |                                |                                    |                                   | l                                  |

|                     | I                         | I                        |                           | 1                         |
|---------------------|---------------------------|--------------------------|---------------------------|---------------------------|
| 278:1 291:18        | serving 89:15             | 96:3 107:21 135:3        | 281:1,7,12 284:6          | <b>showed</b> 249:9       |
| 293:17 297:6        | session 71:11 89:13       | 135:4 138:4              | 284:9,10 288:3            | 293:10                    |
| 301:9,9 302:5,11    | 92:14,16                  | 145:12 149:19            | 290:20 291:4,12           | showing 64:17             |
| 316:8 317:22        | sessions 8:20             | 154:13 164:4             | 291:19 292:11             | 158:2                     |
| 321:6 378:2         | 134:20                    | 166:16 173:10            | 293:6,10,11,12,18         | shows 249:2               |
| services 1:6,14 2:1 | set 9:5,8 43:20           | 189:10 273:6             | 294:4,4,13 296:14         | shutdown 30:7             |
| 4:13,14 6:5,12      | 110:9,12 187:7,12         | 321:22 323:7             | 296:19 337:18             | 134:2,4 280:9             |
| 8:11,14 14:3        | 209:9,21 224:7            | Sherri's 159:3           | 338:2 340:3,4             | 326:18                    |
| 15:14 16:8 18:16    | 255:12 268:7              | <b>she'll</b> 112:6      | 341:9 344:14              | shutting 133:22           |
| 32:6 35:13,20       | 280:1 284:17              | shift 195:22             | 351:4,4 382:2             | 134:1                     |
| 36:10,20 39:7       | 288:5 352:13              | Shingledecker 1:25       | 384:5,13,14 386:5         | <b>shuttle</b> 400:18     |
| 44:15,20 45:5       | 390:10                    | 77:20,21 122:2           | 389:7                     | 402:4                     |
| 48:18,21 49:13      | <b>sets</b> 96:2          | 145:4                    | shipyard 189:19           | <b>shy</b> 202:8          |
| 50:6 51:1 54:12     | settled 98:6              | <b>ship</b> 44:12 57:17  | 341:10                    | <b>side</b> 36:20 44:16   |
| 54:12,21 56:16      | seven 100:21              | 101:6 142:3,21           | <b>ship's</b> 284:4       | 50:7 71:20 75:20          |
| 57:6 66:19 76:13    | 200:17 267:16             | 143:12 160:1             | <b>shoes</b> 401:13,14,16 | 112:13,14,15              |
| 76:14 81:6 83:12    | 278:2 370:22              | 161:3 165:21             | <b>shore</b> 186:15       | 153:3 170:6               |
| 85:21 90:21 91:2    | 377:22 381:19             | 166:14 168:7             | 206:12 272:18             | 198:12 199:15,17          |
| 91:13 93:16 98:22   | <b>severe</b> 391:9       | 173:12 189:15,19         | 310:18                    | 207:15 235:17             |
| 99:13,14,18,21      | severely 24:12            | 190:9 192:21             | shoreline 15:8            | 244:11 268:11             |
| 105:18 111:3        | <b>sexy</b> 145:18        | 235:5 253:17             | 45:13 76:16 209:7         | 271:19,20,20              |
| 114:10 119:13,18    | <b>shadow</b> 84:14       | 286:9 291:7,20           | 211:10,10 220:11          | 286:7 322:19              |
| 119:18 120:8,10     | <b>shallow</b> 76:11      | 295:3 297:17,17          | 224:7 228:21              | 327:7 339:21              |
| 120:21 121:12,22    | 203:4                     | 301:13 309:4             | 235:18 238:2              | 346:8 356:5               |
| 122:7,10 125:5,16   | shameful 142:8            | 337:19 338:10,18         | 267:19 373:8              | 357:10 358:8              |
| 125:18,22 128:3     | Shanghai 293:15           | 340:12 350:15            | 377:7                     | 393:7 402:4               |
| 131:21 133:10,15    | 296:21                    | 361:5 395:21             | shorelines 211:7          | side-scan 321:4           |
| 134:8 138:17        | <b>shape</b> 66:11 157:15 | 396:2 401:17             | <b>shores</b> 337:11      | 322:15 324:17             |
| 139:4 143:3         | 207:13                    | shipboard 282:2          | <b>short</b> 23:10 30:18  | 325:6 330:10              |
| 152:13,14,18        | shaping 89:5              | <pre>shipping 44:3</pre> | 107:10 125:10             | 388:10 389:9              |
| 154:16 155:8        | <b>share</b> 48:2 89:10   | 75:16 80:5,10            | 127:14 137:15             | side-scanners             |
| 157:19 164:15       | 93:21 175:18              | 128:19 281:3             | 177:10 274:5              | 328:6                     |
| 165:18 168:4,17     | 193:3 196:21              | 290:15 389:11            | 283:13,16 310:13          | <b>siege</b> 16:3         |
| 172:5 173:3,4       | 214:17 352:14,15          | <b>ships</b> 42:11 48:18 | shortage 118:11           | <b>sign</b> 9:15,16 176:8 |
| 176:3 177:5,10      | 353:21 354:4              | 56:19 57:16,21           | shortening 346:19         | 203:21                    |
| 179:6 187:1,13      | 367:8 380:9               | 64:14 68:12 72:19        | shorter 247:7             | signal 232:7 233:1        |
| 207:6 211:17        | shared 89:18,21           | 72:22 74:2,18            | shortfall 23:11           | 258:6                     |
| 218:12,15 219:6     | 94:1 215:2                | 75:21 101:16,17          | shortfalls 126:18         | signals 29:17 36:3        |
| 223:17 234:18       | sharing 255:19            | 105:13 135:12,12         | shortlisted 272:21        | 232:9                     |
| 235:21 236:13       | 347:14 386:18             | 139:12,20,22             | <b>shortly</b> 127:4      | signature 204:2           |
| 237:4,11 245:7,8    | <b>sheep</b> 340:17       | 140:1,9,16 141:17        | 129:18                    | signed 9:14               |
| 267:15 278:19       | sheet 9:15 176:9          | 141:18,22 142:2,5        | shots 233:12              | significant 15:3          |
| 279:1 283:6         | 307:14                    | 142:10,13,22             | <b>show</b> 46:21 64:4,11 | 22:2 36:13 98:15          |
| 291:13 310:3,7,22   | sheets 390:18             | 156:13,22 157:5          | 73:14,14 114:7            | 111:2 124:11              |
| 314:16 318:1        | shelf 382:22              | 161:10 180:17            | 131:17 274:16             | 281:12,15 370:14          |
| 340:1 384:10        | shelves 288:14            | 188:8 204:5              | 293:11 348:2              | 372:22 377:4              |
| 390:11 391:10       | <b>Sherri</b> 1:22 73:7   | 253:13 280:21,22         | 395:4                     | significantly 321:8       |
|                     |                           |                          |                           |                           |

|                            | 1                         | 1                        | 1                     |                            |
|----------------------------|---------------------------|--------------------------|-----------------------|----------------------------|
| <b>signs</b> 213:14        | <b>six</b> 53:14,14,21    | 225:10 230:16            | 330:10 388:10,16      | sources 159:11             |
| <b>silo</b> 50:19          | 100:21 126:10             | 254:6 272:11             | 389:1,10              | south 20:8 79:4            |
| <b>silting</b> 65:20       | 130:2 144:14,15           | 291:20 301:13            | sonars 395:12,18      | 154:11 268:17              |
| 244:10                     | 182:12 267:15             | 336:4 339:17             | <b>soon</b> 32:2 51:4 | 273:5 296:4                |
| <b>Silver</b> 9:11 89:13   | 279:11                    | 396:15 397:14            | 104:20 110:6          | 376:21                     |
| 93:7 115:10                | size 207:14 317:19        | smaller 94:1             | 163:4 193:19          | southeast 268:19           |
| 362:12                     | 347:6                     | 136:13 257:8,10          | 217:3 280:5           | <b>southern</b> 347:22     |
| <b>similar</b> 68:1 174:16 | skies 307:11              | <b>SMAs</b> 165:3        | 286:19 287:14         | <b>So-and-So</b> 55:22     |
| 183:13,15,17               | <b>skills</b> 188:16      | Smith 3:11 137:18        | 320:14                | <b>Spa</b> 1:15            |
| 191:14 225:9               | <b>skim</b> 68:17         | 385:16                   | <b>sooner</b> 286:18  | <b>space</b> 169:13        |
| 310:10 376:6               | <b>skinny</b> 349:4       | snagged 128:16           | sophisticated 83:20   | <b>spatial</b> 40:1,11,20  |
| 396:10                     | skipped 72:6              | snapping 344:21          | 286:8 388:10          | 40:22 41:5 47:15           |
| simply 187:10              | <b>skunked</b> 111:6      | snapshot 178:4           | sorry 30:11 31:14     | 47:16 79:6 82:22           |
| 331:15 380:11              | <b>slide</b> 32:11 43:9   | 224:13 225:5             | 60:12 114:22          | 122:4,8,12 123:1           |
| 382:18                     | 51:20 89:1 91:4           | <b>snow</b> 133:15       | 174:13 252:9          | 123:5,16 124:1,5           |
| <b>sing</b> 368:18         | 182:1 184:5 185:3         | societal 120:8           | 297:22 326:15         | 140:13 141:4               |
| <b>single</b> 242:13,13    | 186:12 188:19             | socioeconomic            | 365:10                | 145:7 207:17               |
| 384:3,8                    | 194:1 198:19              | 218:11 223:16            | sort 21:11 26:1       | 208:12 218:18              |
| sir 58:17 377:15           | 199:20 201:3,4,17         | <b>sold</b> 152:16       | 29:5,9 30:6 71:6      | 219:7 224:8                |
| sister 185:14,15           | 203:8 209:20              | <b>solemnly</b> 10:17    | 71:10 82:22 91:22     | 262:21                     |
| sister-in-law 20:6         | 217:4 225:14              | <b>solicit</b> 392:9     | 93:13 94:8 95:2       | Spatially 152:15           |
| sit 32:8 41:16 142:6       | 226:17 236:5              | <b>solo</b> 203:2        | 99:10 105:8,9,21      | speak 7:19 8:5             |
| 161:20 248:17              | 237:9 241:2,8             | solution 98:1            | 107:18 121:9          | 56:12 190:18               |
| 322:16 326:16              | 245:6,16 251:13           | 156:22                   | 124:18,21,22          | 221:12 227:9               |
| 371:8                      | 255:1 257:14              | solutions 357:19         | 125:17 134:13         | 290:3 301:17               |
| site 218:7 222:9,15        | 261:10 263:2              | 358:3                    | 142:7 144:8           | 328:1 367:16               |
| 271:10 279:5,15            | 265:9,11 267:9            | solve 23:10 111:4        | 146:21 152:21         | 369:13 381:4               |
| 370:3 371:4                | 269:11 290:11             | 138:7 153:3              | 168:1 170:16          | speaker 11:12              |
| 388:15 389:1               | 292:4,12,18 293:9         | <b>solved</b> 170:4      | 196:3 204:15          | speakers 275:17            |
| 400:12 401:1               | 294:18 296:8              | <b>somebody</b> 127:2,11 | 230:9 270:6,16        | 398:20                     |
| sites 212:18 242:7         | 300:6 306:9               | 137:16 142:20,22         | 271:17 330:20         | speaking 104:19,19         |
| 262:17 360:22              | <b>slides</b> 33:13 36:22 | 150:8 155:8 156:2        | 342:2 352:4,18        | 106:22                     |
| site-specific 388:16       | 89:2 198:22               | 163:17 169:5             | 362:1,13 363:10       | <b>spec</b> 108:19         |
| 388:19                     | 213:21 215:22             | 323:16 332:9,10          | 363:12,14 365:6       | special 8:19 95:18         |
| <b>siting</b> 42:16        | 216:21 245:15             | 353:16 363:19            | 365:14 391:17,22      | 130:10 167:3               |
| sits 105:17 244:11         | <b>slight</b> 7:19        | 395:4                    | 392:7 398:13,15       | 250:9,12 362:19            |
| 328:16                     | slightly 110:11           | somebody's 284:14        | sorts 44:6 81:13,16   | 382:11                     |
| sitting 86:7 132:22        | 232:10 236:9              | 337:11                   | 83:20 101:2           | specialized 259:12         |
| 147:9 148:7                | <b>SLOSH</b> 260:2        | <b>someday</b> 303:14    | 261:14 265:2          | 260:9                      |
| 168:10 200:21              | <b>slow</b> 169:16 307:21 | someone's 191:19         | 353:19                | species 313:22             |
| 286:21 342:9               | 315:21 316:6              | someplace 246:13         | sound 7:18 17:7       | <b>specific</b> 36:20 59:9 |
| 351:16 395:20              | slower 248:20,21          | something's 336:14       | 19:6 45:19 314:13     | 91:16 100:13               |
| situation 12:11            | slowly 8:5                | someway 308:7            | 366:18                | 103:16 114:5               |
| 72:4 127:10 128:9          | small 15:2 127:21         | somewhat 34:8,15         | sounded 102:21        | 172:12 192:11              |
| 153:20 154:22              | 140:8 141:18              | 67:3 76:3 333:20         | sounds 353:12         | 218:6 282:22               |
| 155:2 166:10               | 146:10 147:1              | sonar 321:4,9            | <b>source</b> 64:19   | 374:11 376:9               |
| 354:12 397:5               | 153:8 182:19              | 322:15,20 325:6          | 272:17                | 379:18 392:17              |
|                            | l                         |                          | l                     |                            |

|                            |                      |                     |                      | Page 44                           |
|----------------------------|----------------------|---------------------|----------------------|-----------------------------------|
| 394:6 399:6                | 34:9,15 35:22        | 309:4 336:3 344:4   | 399:5                | stay 71.10 329.17                 |
| specifically 184:15        | 53:18 281:5          | 363:13 384:14       | stated 210:18        | stay 71:10 338:17<br>339:3 345:18 |
| 185:7 319:3,22             | stack 160:14         | started 14:21 32:3  | statement 17:11,12   | 367:6                             |
| 321:2 324:5 330:4          | staff 2:15 3:17 16:6 | 32:4 38:2 74:6      | 141:16 189:14        | staying 81:14                     |
|                            |                      |                     |                      |                                   |
| specs 380:9                | 80:6 85:8 89:14      | 81:8 99:20 107:3    | 228:9 333:20         | stays 403:1                       |
| speech 114:22              | 106:4 115:9          | 147:17 149:20       | 373:18               | steady 295:11                     |
| <b>speed</b> 19:11 47:1    | 137:12 373:12,13     | 202:1 223:19        | statements 123:13    | steal 246:19                      |
| 166:6 287:21               | <b>staffed</b> 112:9 | 224:12 248:13       | 134:11               | steam 292:10                      |
| 296:10                     | staffers 394:8       | 256:14 290:14       | states 10:19 11:17   | steel 241:22 242:13               |
| <b>Speedos</b> 401:12      | 398:2                | 292:8 298:13        | 15:20 28:1 65:6      | 242:14,15                         |
| speeds 361:11              | staffing 57:22       | 306:6 337:22        | 74:5 77:22 101:3     | steep 43:6 256:11                 |
| <b>spend</b> 58:2 60:9     | staffs 394:15        | 344:9 362:14        | 102:3 116:21         | 401:22                            |
| 66:9 67:1 72:2             | staff's 197:7        | 391:11              | 117:15,16,22         | <b>steeper</b> 307:18             |
| 91:21 160:22               | stage 9:5 127:6      | starting 22:16      | 146:15 149:5         | steer 92:4                        |
| 169:13 171:9,12            | 187:12 205:7         | 58:10 139:15        | 227:5 233:6 278:5    | <b>STEIN</b> 3:12                 |
| 296:18 392:3               | 209:9,21             | 201:13 229:6        | 314:4 320:21         | step 46:12 86:10                  |
| spending 50:8 58:8         | stairs 7:12,13,15    | 266:11 346:12       | 382:13 383:17        | 118:13 155:9                      |
| 66:9 67:19                 | stakeholder 2:1      | 366:9               | 391:8 397:14         | 156:3                             |
| spends 197:22              | 4:14 51:16 133:7     | starts 66:17,17     | statewide 285:18     | Stephen 87:3                      |
| <b>spent</b> 67:9,13       | 172:11 173:1         | 113:7 258:14        | state's 154:14       | <b>Steve</b> 2:2 4:15 87:6        |
| 153:19 197:18,21           | 176:3 366:7,15       | 336:2 344:21        | state/federal 83:8   | 87:7,8,9 147:16                   |
| <b>spill</b> 68:3,14,15,17 | stakeholders 14:1    | startup 190:9       | static 97:5          | 291:17 294:11                     |
| 124:20 156:12,19           | 276:18 366:11,22     | starving 25:15      | stating 107:10,10    | 297:14 312:11                     |
| 184:8,10,19                | stamp 152:5          | state 3:10 11:18,20 | station 147:14       | 322:2 337:16                      |
| 203:14                     | stand 21:16 34:21    | 11:21 12:11,18      | 218:6 234:9 242:1    | 343:17                            |
| spilled 183:11             | 367:19,22 369:4      | 14:11,12 15:16      | 264:18 265:3,7       | Steven 277:17                     |
| spilling 68:12             | standardization      | 16:5 17:14,17       | 270:13 286:11        | Stevens 396:19,20                 |
| <b>spills</b> 68:5         | 256:7                | 19:21 21:20 22:19   | 287:2 334:1          | 397:3                             |
| spins 335:19               | standards 82:15,20   | 23:8 24:10,17       | stationary 148:12    | stewardship                       |
| spin-off 233:15            | 101:1 239:14         | 25:21 26:5 27:3     | 148:13               | 102:13 103:8                      |
| <b>Spirit</b> 339:6        | 264:21 388:3         | 27:10 74:13 82:18   | stationed 317:4,5    | stick 242:18                      |
| spoke 291:18               | standpoint 30:6      | 83:2 91:7 98:13     | 368:3                | <b>Stimulus</b> 110:18            |
| 333:20                     | 103:7 318:12,13      | 98:16 126:6         | stations 70:4 213:7  | 111:2,7                           |
| sponsors 116:20            | 320:4                | 133:14 135:17       | 213:7 219:15         | stocks 199:9                      |
| <b>spot</b> 135:11 250:17  | stands 110:15        | 169:10 184:15       | 222:10 232:21        | stop 123:5 382:7                  |
| 341:1                      | 272:13               | 200:16 228:16,18    | 233:7 241:12         | <b>stopped</b> 123:14             |
| <b>Spring</b> 9:11 89:13   | stand-up 334:19      | 251:12 259:2        | 243:12 245:2,3       | storage 279:7                     |
| 89:15 90:15 92:22          | stare 29:3           | 264:16 272:22       | 247:6 251:19         | 312:11,14                         |
| 93:7 115:9,10              | start 14:19 33:14    | 278:5,6,8,8         | 263:10,20,21         | store 288:13                      |
| 362:12                     | 35:1 52:1,20 53:5    | 279:13 283:17       | 265:6 268:16,18      | stores 19:12                      |
| sprinkled 133:5            | 67:19 70:6,11        | 285:17 286:13       | 343:7                | <b>stories</b> 50:10              |
| square 201:19              | 72:14 100:7          | 299:4 306:8         | statistically 148:12 | storm 27:18 78:6                  |
| 319:6 372:1                | 152:21 181:10,17     | 336:10 338:14       | statistics 131:20    | 242:2 243:20                      |
| <b>St</b> 185:17 251:4     | 187:4 195:19         | 339:1,10 348:17     | status 107:11 341:9  | 259:8,11,13,15                    |
| stability 57:10            | 240:10,18 250:15     | 352:16 355:2        | <b>statute</b> 6:9   | 260:3,14,14,20                    |
| stabilize 37:18            | 258:13,15,16         | 366:21 378:3        | statutory 65:2       | 262:14 273:7,22                   |
| stable 23:9 33:20          | 261:19 277:17        | 387:17 391:9        | 392:12               | 323:3 348:11                      |
| Saure 25.7 55.20           |                      | 501.11 571.7        | 574.14               | 545.5 570.11                      |
|                            | I                    | I                   | I                    | I                                 |

٦

| <b>storms</b> 259:6              | struck 96:22 170:2                               | 263:3                             | 119:19 183:22           | <b>surfers</b> 335:3       |
|----------------------------------|--|-----------------------------------|-------------------------|----------------------------|
| story 40:12 51:7                 | 390:4,7,12                                       | subthemes 257:21                  | 189:8 191:1             | 343:19                     |
| 157:11 310:10                    | <b>structure</b> 145:16                          | <b>subtle</b> 318:8               | 222:12 230:15           | surfing 391:22             |
| 312:9 341:14                     | 200:12 278:11                                    | success 312:3,9                   | 235:14 237:11,12        | <b>surge</b> 242:2 243:20  |
| stovepipes 378:4                 | structures 69:17                                 | 315:10                            | 238:14 240:7            | 259:11 260:3,14            |
| straight 160:19                  | 373:1  | successful 152:2,3                | 241:6 260:19            | 260:14 262:14              |
| 161:2                            | struggling 33:17                                 | 355:4                             | 262:12,22 371:3         | 271:20 273:8,22            |
| straightens 205:16               | 58:7   | successfully 111:1                | 378:22 383:11           | 281:6 312:6 345:2          |
| 205:18                           | <b>studies</b> 252:7 354:6                       | 130:12                            | 384:10,11 389:8         | 345:6                      |
| Straits 189:2                    | 354:10   | succession 338:20                 | 395:13 396:5,14         | surges 27:18               |
| <b>strange</b> 223:12            | <b>study</b> 26:6 33:7                           | <b>sudden</b> 301:20              | supported 238:1         | 344:22 345:12              |
| strategic 12:12                  | 207:13 218:11,18                                 | 307:10 311:3,5                    | 385:14                  | surprised 291:2            |
| 36:19 38:4 81:12                 | 219:4 223:16                                     | suffer 134:4                      | <b>supporter</b> 396:20 | 311:14                     |
| 85:9 88:7 89:5,8                 | 252:5 302:18                                     | suffered 270:20                   | supporting 50:18        | <b>survey</b> 2:9 4:10 7:6 |
| 92:12 94:8 96:18                 | 303:18   | <b>sugar</b> 133:18,19            | 63:11 99:3 257:18       | 45:17 57:5 74:4            |
| 97:18 100:3,11                   | stuff 62:7 73:13                                 | 134:7                             | 260:18 271:2            | 79:5 80:14,20              |
| 103:14 104:4                     | 96:10 102:10                                     | suggest 288:15                    | 395:11                  | 82:9 83:2 85:16            |
| 113:12 114:2                     | 112:2 137:15                                     | 304:15 364:16                     | supports 63:10,10       | 92:3 105:13                |
| 115:21 134:20                    | 139:22 241:4                                     | 365:1                             | 64:5                    | 129:13 130:1,7             |
| 144:10,13 145:11                 | 244:7 257:19                                     | suggesting 51:8                   | supposed 7:21 52:1      | 131:1,9 150:5              |
| 145:18 167:4                     | 265:11 281:1,3                                   | suggestion 142:17                 | 68:4 157:14             | 154:12 161:21              |
| 172:17 174:6                     | 289:22 303:15                                    | 144:4 398:10                      | 392:13 394:7            | 178:17,18 188:16           |
| 193:5,8,19 398:19                | 304:7 305:11                                     | suggestions 54:22                 | supposedly 65:10        | 189:2 190:16               |
| 399:1                            | 313:5 320:11                                     | 100:6 149:18                      | sure 25:16 35:12        | 191:8 196:4,9,21           |
| strategically 46:16              | 327:2 335:13                                     | 277:1                             | 36:16 43:18 49:8        | 206:22 207:5,12            |
| 94:19 95:6 100:14                | 353:18 355:18                                    | suitable 243:14                   | 50:17 51:12 55:22       | 207:15,21 208:1,3          |
| 115:21 398:18                    | 376:3 379:3                                      | suite 194:21 267:14               | 59:7 89:21 92:7         | 208:3,9,17 209:4           |
| strategy 43:13                   | 391:22 401:9                                     | Sullivan 113:5,5                  | 94:6 102:8 123:18       | 210:1,11 211:4,8           |
| 50:14 169:10                     | stuffed 337:4                                    | summarize 233:18                  | 126:19 135:19,20        | 212:4 214:2,7,8            |
| streams 239:3                    | <b>subgroup</b> 364:6                            | summary 129:5                     | 148:19 151:5            | 216:4 217:21               |
| 318:15                           | <b>subject</b> 100:2                             | 178:14,16 234:21                  | 153:17 160:16           | 218:17 220:12              |
| street 29:2                      | 151:20 225:8                                     | 373:13 389:20                     | 165:6,20 167:11         | 222:14 225:10              |
| strengthen 271:13                | subjected 105:4                                  | 398:14                            | 167:18 173:6            | 228:10 231:10              |
| strengthening                    | submarines 198:4                                 | summertime 281:8                  | 176:16 199:9            | 237:13 246:6               |
| 47:12 241:14                     | submerged 82:18                                  | sunk 150:10                       | 222:20 228:12,19        | 247:4 248:6                |
| stressing 104:8                  | 181:8  | sunken 187:18                     | 229:14 236:15           | 249:15 250:9,10            |
| stretches 371:16,19              | submit 214:13                                    | <b>Sunset</b> 343:21              | 244:16,17 282:13        | 285:19 287:1,14            |
| strictly 355:1                   | <b>submits</b> 385:16                            | super 70:2 255:15                 | 319:9,10 320:10         | 324:16 328:8,21            |
| strings 390:21<br>strive 281:9   | <b>submitting</b> 105:3<br><b>subs</b> 254:7     | 364:2                             | 324:9 334:6 336:5       | 328:21 329:1,5,16          |
|                                  |  | Superintendent                    | 341:21 350:9            | 330:4,16 358:4,21          |
| striving 35:11                   | <pre>subsequently 100:5 subset 239:4</pre>       | 5:11 369:9                        | 359:8 375:10            | 368:8 376:14               |
| strong 242:3 346:6               |  | supplied 267:22                   | 379:15 380:13           | 377:10,14 379:4            |
| 365:2 395:10,13<br>395:16 396:4  | <b>subsidence</b> 217:22 218:1                   | support 10:18                     | 387:7 401:14            | 381:19,20 382:2            |
|                                  |  | 15:20,20 19:9<br>26:5 31:20 51:16 | 403:1<br>surf 287:9     | 382:11,14,20               |
| <b>stronger</b> 16:21 23:4 353:2 | <pre>subsidized 155:3,4 substantial 241:21</pre> | 52:9 64:7 84:12                   | surface 179:9           | 384:14 386:5,5<br>391:14   |
| 23.4 333.2                       |  |                                   |                         |                            |
| stronghold 372:7                 | <b>subtheme</b> 261:11                           | 90:22 103:6                       | 218:3 307:5 347:7       | surveyed 108:7             |

| 208:20 210:10       | sympathize 308:12   | 40:18 41:14 42:15    | 75:17 92:1 93:14    | 224:15                  |
|---------------------|---------------------|----------------------|---------------------|-------------------------|
| 214:3 215:1         | synoptic 259:14     | 45:9 47:18,20        | 103:4 133:1         | tariff 279:13           |
| surveying 45:17     | synthesize 172:15   | 61:9 92:13 111:21    | 143:10 173:18       | 342:22                  |
| 77:6 81:2 82:4      | system 15:21 21:9   | 142:4 351:17         | 175:9 195:9         | task 110:12,13          |
| 136:18 143:2        | 21:12,16 61:3,20    | 367:15,16            | 198:14 212:12       | 150:6,7,11,19,20        |
| 151:3 161:14        | 68:11 69:16 71:3    | tables 250:11,21     | 222:19 237:6        | 151:3 156:1,2           |
| 191:5 208:5 286:2   | 72:21 85:22 89:17   | tacit 286:7          | 241:7 277:14        | 160:2 374:10            |
| 377:8 391:12        | 90:5,9 98:2,3       | tackleboxes 153:10   | 293:8 297:8         | <b>tax</b> 63:18 65:3,4 |
| surveyor 76:9 77:7  | 206:1 207:17        | <b>Tahiti</b> 347:22 | 305:19 313:8        | 150:13 152:8,12         |
| 79:1 82:7 141:17    | 208:13 210:20       | take 10:21 34:16     | 315:22 345:19       | 152:13 153:8,21         |
| surveyors 73:22     | 213:17 218:19       | 39:18 49:14 55:5     | 355:9 366:22        | 155:14,16               |
| 74:1 214:20         | 219:8 220:1,6       | 72:6 88:16 97:21     | 387:22              | taxes 66:3 153:8,12     |
| surveys 2:12 15:9   | 221:2 253:6         | 101:6 108:5 109:3    | talked 48:6 50:22   | 155:11                  |
| 45:18 79:2 99:6     | 260:16,21 261:5,6   | 115:4 116:1          | 125:14,20 132:17    | taxpayers 168:21        |
| 130:18 181:5        | 261:20,22 262:13    | 118:13 127:18        | 174:17 185:5        | <b>Taylor</b> 300:18    |
| 190:19,20 220:11    | 265:15 270:22       | 128:11,12 145:15     | 186:13 193:7,11     | 309:14                  |
| 228:15 238:2,13     | 272:16 282:8        | 147:4 174:4 185:9    | 213:22 238:11       | <b>TCOON</b> 69:21      |
| 240:5 245:20        | 283:9 284:6,13      | 192:9 202:11         | 242:9 243:2 245:1   | 243:6 272:21            |
| 251:1 321:3 329:8   | 285:4,18 286:8      | 214:4 239:12,19      | 252:7,14 362:12     | 391:11                  |
| 382:10,17 388:16    | 303:1 315:4,6       | 248:18 264:2,7       | 390:9 398:17        | teach 75:13             |
| 389:3               | 317:17 320:19       | 274:7 275:15         | talking 26:16 39:22 | team 2:2 4:18 85:1      |
| survey's 246:8      | 345:18 351:20       | 276:6 279:12         | 47:5 49:7 92:7      | 85:2 129:21             |
| survive 241:15      | 353:22 354:8        | 280:14 286:17        | 101:8 102:2,2       | 131:10 180:21           |
| survived 242:22     | 359:17 382:12       | 291:12 298:6         | 111:21 112:16       | 181:4 182:19            |
| Susan 1:25 9:22     | 385:20 387:21       | 302:4 308:15         | 113:11 125:7        | 298:4,8 321:4           |
| 31:9 77:20          | systematic 272:2    | 320:14 325:16,18     | 136:5 138:2 161:9   | 322:17 330:4,5          |
| sustainable 152:9   | 385:5               | 334:14,17 335:17     | 167:5,19,20         | 356:22                  |
| 156:22 157:18       | systemic 244:21     | 338:13 361:7         | 209:11 217:19       | teams 144:10            |
| Swatland 3:14 5:11  | systems 68:10,11    | 364:22 369:1         | 218:13 294:11       | 180:19 182:4            |
| 369:6,9 371:14      | 69:14 84:18         | 400:21               | 302:1,7 315:22      | team's 130:19           |
| 373:10,15 374:14    | 118:20 169:15       | taken 52:5 65:18     | 325:13 344:12       | tease 92:17 213:15      |
| 374:21 375:12       | 204:7,9 232:6,14    | 150:6,7,11 155:1     | 352:1 355:14        | tech 139:22             |
| 376:1,17 377:22     | 236:22 237:1        | 156:1,2 158:3        | 357:8,9 359:13      | technical 269:9         |
| 380:20              | 238:21 265:14       | 215:16 267:5         | 373:6,8 377:6       | technically 28:7        |
| swear 10:17         | 281:18,21 282:3     | 295:7 343:8          | 379:14              | 320:7                   |
| swearing 4:2 9:9,18 | 284:3 285:12        | takes 42:12 93:7     | talks 238:18        | techniques 220:9        |
| 9:21                | 291:10 315:2        | 111:16 143:1         | <b>Tampa</b> 184:20 | technologies 83:20      |
| sweep 251:22        | 343:16 352:2,7      | 171:4 190:15         | 256:18              | 244:7 293:4 295:7       |
| swell 343:19        | 362:19 363:14       | 223:18 249:14        | tanker 279:6,12     | technology 71:7         |
| swells 289:3 307:18 | Szabados 81:19      | 250:10 331:17        | tankers 280:22      | 72:19 97:20 139:9       |
| 344:22              | S-E-S-S-I-O-N       | 350:14 358:9         | tanks 279:7 312:15  | 139:11 179:8            |
| swimming 200:20     | 177:1               | <b>Takoma</b> 181:4  | tape 43:3 162:7     | 220:17 228:1            |
| sword 311:2         | <b>S100</b> 388:2   | talk 8:7,22 21:12    | 165:22              | 235:10 236:1            |
| swore 295:2         |                     | 31:17 32:3,3,15      | tapping 64:18       | 244:16 251:17           |
| sworn 10:9 11:6     | $\frac{T}{1.201.5}$ | 33:11 34:5 37:10     | targeted 383:16     | 281:11 283:2            |
| 89:11               | t 391:5             | 40:7 42:20 46:9      | targeting 145:6     | 285:15                  |
| sympathies 175:6    | table 8:3 16:12     | 48:3 57:17 72:3      | targets 198:6       | teleconference          |
|                     |                     |                      |                     |                         |

|                                  |                                 |                                  |                                | Page 452                             |
|----------------------------------|---------------------------------|----------------------------------|--------------------------------|--------------------------------------|
| 173:17                           | 260:20 262:18                   | 357:5 365:4 367:1                | 336:17 345:9,15                | 299:18,19 300:1,2                    |
| teleconferencing                 | 264:21 266:15                   | 367:3 368:10                     | 348:5 351:6                    | 301:2 303:19                         |
| 21:8,9                           | 271:2,3,5,14                    | 371:6,7 380:20                   | 352:21 355:14                  | 304:1,3,9 309:13                     |
| tell 51:7 59:12                  | 272:18 299:14                   | 403:4                            | 360:20 387:18                  | 310:1,6,9 311:10                     |
| 101:14 169:15                    | 360:1 372:11                    | thanks 30:13 52:2                | 390:7,12 392:6                 | 311:11,17 316:18                     |
| 192:14 200:7                     | 387:5 393:5                     | 56:6 87:14 115:1                 | 400:10 401:19                  | 317:11 318:22                        |
| 204:3 226:19                     | 395:11                          | 118:22 171:19                    | things 7:8 21:18               | 331:4 336:3 348:7                    |
| 233:19 250:16                    | term/long 125:11                | 176:7 252:18                     | 26:20 35:10 39:4               | 348:8 353:19                         |
| 259:1 276:20                     | terrestrial 227:4               | 269:14 274:3                     | 39:18 45:8 47:7                | 362:11 364:22                        |
| 302:9 341:14                     | territorial 178:20              | 277:20 298:1                     | 48:14 55:21 57:12              | 372:20 374:6                         |
| 366:12 368:19                    | 195:6 196:9                     | 313:12 323:7                     | 60:6,8 61:2 62:14              | 388:18 390:4                         |
| 371:10                           | territory 221:16                | 328:11 367:10                    | 68:2,8 71:20                   | 391:17 394:2                         |
| tells 259:10                     | terrorism 99:6                  | 368:6 369:12                     | 74:21 78:6,7                   | 395:15,17 399:10                     |
| template 352:14                  | <b>Tesoro</b> 343:8             | 385:3 386:8                      | 79:12 81:13,16                 | think 9:17 16:7                      |
| temporary 166:22                 | <b>test</b> 264:6               | 389:12 391:2                     | 84:9 88:5,21 95:9              | 17:11 18:21 19:3                     |
| ten 8:16 53:21                   | testifying 227:18               | theme 38:13 91:15                | 98:7,18 100:1                  | 21:9 25:4,7,16                       |
| 89:18 145:14                     | testimony 132:8                 | 144:21 171:9                     | 112:15 114:21                  | 27:9,15,22 28:20                     |
| 274:7 280:12                     | <b>Texas</b> 27:14 69:1         | 330:21                           | 116:14,18 118:18               | 29:1,11,19 30:4,8                    |
| 321:20                           | 69:12,21 82:4,12                | themes 95:4 109:17               | 121:19 125:3                   | 31:1 32:1,9,19,20                    |
| tend 381:21 383:4                | 82:15,17,22 83:2                | 330:20 398:16                    | 129:4 133:11,12                | 33:8 34:6,10,21                      |
| tenders 315:13                   | 116:12 150:11                   | 399:2                            | 135:9 136:20                   | 35:1,1,8 36:6,10                     |
| 317:2,2                          | 212:7 240:10,21                 | theoretically 70:22              | 138:4 140:3                    | 36:12,21,22 37:10                    |
| tends 277:7 388:16               | 243:3 262:1                     | thickness 242:15                 | 141:20 144:5                   | 37:15 39:6 42:6,7                    |
| 393:9                            | 272:22 273:4                    | 242:15                           | 145:20 147:6                   | 42:18 43:2 45:18                     |
| tentative 225:6                  | 391:7,8                         | thing 17:7,13 21:7               | 149:21 155:10,15               | 46:3,22 47:8,15                      |
| tenure 12:1                      | <b>text</b> 122:1 241:15        | 25:10 31:1 39:8                  | 159:17 171:5                   | 48:7,11 51:13,19                     |
| tenure-wise 73:19                | <b>thank</b> 7:2 11:8 13:2      | 50:3,19 51:15                    | 174:19 175:8                   | 52:3,14 55:2,10                      |
| term 23:10 74:15                 | 13:3,5,7,19,21                  | 54:16 55:9 72:5                  | 197:7 198:17                   | 58:9,13 59:18                        |
| 74:17 78:21 98:8                 | 18:20 19:9,13,16                | 106:7 114:9 118:2                | 199:8 204:20                   | 61:4 62:5,16                         |
| 116:16 125:11                    | 30:10,14,20 52:9                | 129:12,14 131:16                 | 207:10 209:5,7,10              | 63:16 64:1,3,10                      |
| 173:4 244:18                     | 52:17 71:12 77:19               | 131:22 139:8                     | 209:13,14 210:22               | 69:7 71:9,11                         |
| 263:6 266:15,17                  | 79:18 80:17 85:12               | 141:14 146:21                    | 215:9 219:11                   | 86:15 93:6,15,18                     |
| 268:16 269:7                     | 88:18 94:15 119:5               | 155:14 158:21                    | 220:10 229:18,19               | 94:19,22 95:4                        |
| 270:15 362:17,18                 | 132:14 175:1,2                  | 161:15,15 180:15                 | 232:13 234:7                   | 96:21 97:18                          |
| terminal 340:22                  | 177:21 179:13                   | 184:6 194:11                     | 235:12,14,19                   | 100:13 101:22                        |
| 350:12                           | 205:14 206:19                   | 203:16 204:7                     | 237:18 238:6,10                | 102:11,16,17                         |
| terminated 189:14                | 207:3 226:8                     | 228:20 241:9                     | 238:20 240:11                  | 103:3,18,21 104:2                    |
| termination 206:14               | 231:19 233:16                   | 243:10 247:12                    | 241:8 243:21                   | 104:2,7,8,9 107:2                    |
| <b>terms</b> 6:16 38:1           | 234:14,15,20                    | 249:17 252:12                    | 244:1,20 247:17                | 107:17 110:13,14                     |
| 43:6 46:21 50:5                  | 290:4,5 297:22                  | 261:15 262:16                    | 254:16 255:22                  | 110:16 111:8,14                      |
| 93:11 99:19                      | 298:5,13 302:20                 | 266:3 276:14                     | 256:5,12,14                    | 111:19 112:4,6,18                    |
| 103:13 121:11                    | 305:21,22 306:4                 | 287:7 294:12                     | 258:21 261:14                  | 113:9 114:8,17,18                    |
| 139:19 236:11,22                 | 306:10 307:13                   | 298:12,15 307:16                 | 262:14 265:2                   | 115:3 117:22                         |
| 238:4,8 240:12                   | 309:21 313:1,7<br>321:13 330:17 | 308:10 313:18<br>314:17 315:9,20 | 266:7 267:5,16<br>268:1 270:10 | 119:21 120:2,16<br>121:1 123:8 125:9 |
| 249:18,22 254:16<br>255:6 258:21 | 332:20 333:8                    | 318:6 321:1 322:5                | 271:12 284:3                   | 125:14,21 126:10                     |
| 259:11 260:6,17                  | 334:16 340:2                    | 318.0 521.1 522.5                | 288:10 299:1,4,16              | 126:22 127:6,15                      |
| 237.11 200.0,17                  | 554.10 540.2                    | 541.15 551.7                     | 200.10 277.1,4,10              | 120.22 127.0,13                      |
|                                  | l                               | l                                | l                              | I                                    |

| 136:19 137:9      | 44:14,19 45:12          | 378:3 390:8               | timber 336:6      | 384:15 388:4            |
|-------------------|-------------------------|---------------------------|-------------------|-------------------------|
| 138:1,4,19 139:20 | 52:22 84:2,11           | 398:16                    | timbers 304:11    | 396:2                   |
| 140:4,5,7 141:2,4 | 88:7 93:10 94:18        | <b>throw</b> 91:22 120:22 | 335:11 336:16     | <b>timed</b> 308:3      |
| 141:8,19,20 142:5 | 100:7,10,12             | 124:11 349:15             | time 12:21 13:11  | <b>timeline</b> 400:20  |
| 144:3 147:13      | 104:20 115:20           | 388:13                    | 17:1,2 21:1 28:4  | timely 108:10           |
| 150:19 151:1      | 134:20 148:10           | thrust 42:8               | 38:12 45:7 48:8   | <b>times</b> 36:2 47:11 |
| 154:22 155:17     | 334:7 357:19            | thunder 246:19            | 49:19 50:8 52:5   | 150:7 165:14            |
| 157:21 158:16     | 391:1                   | Thursday 291:7            | 56:12 57:17 65:17 | 190:3 241:16            |
| 159:18 164:7,13   | thinks 112:5 139:1      | 299:20                    | 71:1 72:3 95:2    | 336:13 345:21           |
| 165:1 167:13      | third 80:11,21          | ticket 178:3              | 98:2 99:20 108:6  | 349:8,12 353:5          |
| 171:5,8,10,21     | 88:10 91:1 265:16       | tidal 83:22 130:15        | 108:12 113:15     | 384:21                  |
| 173:21 174:20     | 298:18,19 393:16        | 130:16 149:2              | 136:22 142:14     | <b>Tinian</b> 329:6     |
| 177:19 178:11     | <b>Thomas</b> 1:22 3:16 | 212:1 213:2 235:8         | 144:22 146:8      | <b>title</b> 112:21     |
| 181:21 184:21     | 203:20 207:18           | 235:15,22 237:19          | 148:6 155:17      | <b>TJ</b> 204:4         |
| 186:11 187:22     | 235:4                   | 238:4,9 239:8             | 156:15 158:2,7    | today 8:22 16:15        |
| 188:8 196:22      | Thomas/St 185:17        | 245:11,18,19,22           | 160:10 161:1,13   | 40:5 41:3 73:17         |
| 197:9 201:4,12,13 | thoroughly 130:22       | 246:6 250:8               | 161:19,22 162:17  | 85:11 91:20             |
| 217:10 231:5,9    | thought 21:18           | 265:20 267:21             | 163:7,8 167:2,21  | 101:20 112:16,18        |
| 233:20 234:2      | 31:15 34:8 41:12        | 268:3 279:14              | 168:6 171:10,13   | 113:4 199:2 208:3       |
| 236:21 240:15,20  | 61:9 79:11 94:6         | 289:19 296:5              | 173:12,15 187:11  | 235:10 293:8,15         |
| 265:20 266:2      | 103:4,14 107:18         | 317:10                    | 187:19 190:15     | 303:11,11,12,12         |
| 268:9 271:11      | 119:7 121:8 280:2       | tidally 84:1              | 192:5,12,14 197:1 | 305:2 332:6             |
| 277:11 297:10     | 290:16 293:7            | <b>tide</b> 44:20 45:14   | 205:20 207:9      | 369:13 379:10           |
| 299:3 300:17      | thoughts 44:6 90:2      | 69:13,22 70:3,4           | 208:1 210:21      | 381:17 383:22           |
| 301:5 303:4       | 91:12 92:20 93:13       | 82:13 121:17              | 211:20 213:13     | 387:17 390:9            |
| 305:12 310:4      | 95:2 100:3 106:19       | 147:1,14 148:1,2          | 215:2 218:20      | 398:14 403:5,8          |
| 311:1,10,13       | 173:20 367:7            | 148:2,3,5,17              | 222:3,21,21 226:6 | today's 389:21          |
| 315:10,11 316:3   | thousand 239:2          | 189:8 213:7 235:8         | 228:16 230:5      | toe 392:7,10            |
| 318:3,5,11,19     | threat 121:10           | 235:22 238:22             | 232:10 233:7,10   | told 147:16 246:7       |
| 319:17 320:20     | threatened 17:9         | 239:1 242:1               | 233:22 236:2      | <b>Tom</b> 3:11 60:16   |
| 321:11 323:3,4,19 | three 8:21 21:14        | 245:10,18 249:19          | 241:15 242:20     | 72:16 73:9 116:17       |
| 324:15 326:1,5    | 22:16 36:21 70:14       | 249:21 250:11             | 246:8 247:5       | 189:10 292:14           |
| 332:12 333:10     | 73:3 75:19 85:21        | 258:15 263:20,21          | 251:18 263:22     | Tomodachi 389:5         |
| 334:13 341:16     | 86:7 87:2,20            | 264:18 269:22             | 276:16 277:5      | tomorrow 23:13          |
| 350:6,13 351:4,12 | 116:16,19 133:6         | 270:5,13,17               | 279:16 280:3,8    | 27:1 75:17 101:14       |
| 351:17 358:1,16   | 134:10 142:2            | 271:13,19 273:9           | 282:12 283:20     | 141:4 255:4 291:6       |
| 358:18 359:4,19   | 165:13 177:8            | 312:7                     | 284:17 287:19     | 293:22 301:12           |
| 360:5,14 361:14   | 178:1,9 195:18          | tides 15:13 26:7          | 288:11 289:4      | 340:12,21 342:1         |
| 362:11 363:17,18  | 208:2 211:16            | 74:14,15 79:10            | 292:7 305:10      | 350:2,11,20             |
| 366:14 367:17     | 213:6 217:15            | 146:19 147:5              | 308:11,15 309:3   | 351:13 400:9            |
| 374:1,13 377:6    | 224:17 236:16           | 148:9,11                  | 310:11,14 314:12  | 402:14                  |
| 380:18 390:6      | 237:5 238:12            | tie 156:8 213:8           | 316:2 337:19      | ton 348:15              |
| 393:7,21,22 394:3 | 245:10 257:21           | 361:7                     | 339:15 343:18     | tonight 274:14,18       |
| 394:8,19 397:13   | 273:4 274:3             | tied 143:19 361:1         | 344:9 346:22      | 402:16 403:9            |
| 398:9,17,22       | 280:17 283:14           | Tiffany 2:15 276:1        | 350:11 354:20     | tool 282:11 327:12      |
| 399:22            | 317:2 345:6 349:8       | 276:1,9                   | 358:6 361:5       | 380:4 391:18            |
| thinking 28:18,19 | 349:12 354:6,22         | tight 188:21 384:21       | 371:22 381:22     | tools 239:17 370:20     |
|                   |                         |                           |                   |                         |

|                     |                       |                              |   | Page 454                 |
|---------------------|-----------------------|------------------------------|---|--------------------------|
| top 7:21 92:7 93:10 | 346:6 358:19          | treating 148:16              | 71:8 87:13 154:5                              | 265:1 270:16             |
| 248:15 267:1,13     | traditional 120:13    | tree 175:12 336:6            | <b>truthful</b> 30:2                          | 286:1 299:21             |
| 291:11 339:22       | 134:22 140:19         | 402:20                       |   | 326:20 370:13            |
|                     |                       | 402:20<br>trees 335:12 337:9 | <b>try</b> 8:2,7,17 35:14<br>41:17 48:12 49:8 |                          |
| topic 86:22         | 148:10 277:8          |                              |   | 372:21 389:6             |
| topics 172:13,14    | traditionally 182:3   | <b>tremendous</b> 41:10      | 61:1,9 113:14                                 | tsunamis 121:8,18        |
| topo 229:2          | <b>traffic</b> 140:16 | 44:7 52:6 279:17             | 114:6 134:20                                  | 180:9 286:17             |
| topographic 213:1   | 169:15,16 282:10      | 307:3 311:9                  | 138:3 141:3                                   | 287:6 300:4              |
| <b>TORE</b> 2:18    | 339:13,18             | tremendously                 | 143:13 162:4                                  | tsunami's 21:1           |
| tornado 216:10      | tragedy 121:6,20      | 172:8 284:13                 | 175:12 178:1                                  | <b>tug</b> 2:20 288:2    |
| 230:3 234:1         | train 283:1           | 306:21 311:21                | 189:21 190:6                                  | 306:6,17 310:13          |
| tornados 216:15,20  | trained 82:7 95:12    | 361:13                       | 199:14 250:19                                 | 342:5                    |
| Torres 87:4         | 281:10                | trend 352:11                 | 262:16 264:19                                 | <b>tugs</b> 307:9,21     |
| toss 318:11         | training 79:1 89:13   | 361:11                       | 270:5,22 299:12                               | 342:21 345:20            |
| total 22:13,19      | 184:13,22 382:11      | trends 244:19                | 315:14 317:8,14                               | <b>turn</b> 6:19 11:7    |
| 246:10              | trajectory 23:5       | 263:7 264:2                  | 318:22 354:1                                  | 104:11 167:7             |
| totally 18:22       | transfer 198:8        | tried 7:4 48:22              | 356:17 392:9                                  | 277:12 280:14,16         |
| 165:11 388:11       | 265:5 292:1           | 171:22 310:8                 | 399:15  | 313:13 333:21            |
| touch 230:9 318:6   | transhipped 288:8     | 318:2 322:14                 | trying 16:10 17:16                            | turnaround 324:16        |
| 321:12 331:21       | transit 216:6 255:6   | 364:20                       | 25:11,16 43:7                                 | 330:16                   |
| 367:6               | 281:7 288:3,20        | <b>tries</b> 331:4           | 46:12,19 47:8,9                               | <b>turned</b> 130:1      |
| touched 60:18       | 306:20 312:12         | triggers 98:22               | 47:14 49:3,18                                 | 181:18                   |
| 232:1               | 323:16 350:17         | trilateral 240:9             | 50:8 55:17 61:5                               | <b>turning</b> 206:9     |
| touching 101:9      | transition 216:1      | trip 295:4 297:1             | 61:10 62:11 64:3                              | 235:1 391:18             |
| tough 36:3 58:16    | 261:21 262:8          | <b>trips</b> 338:5,6         | 67:9 68:16 75:5                               | <b>turtle</b> 372:8      |
| 61:12 128:13        | 365:15,19             | triumvirate 207:6            | 83:13,15 84:5                                 | turtles 337:5            |
| tour 350:14 351:12  | transitioned          | tri-agency 238:19            | 87:18 108:22                                  | Tuscaloosa 216:3         |
| 402:4               | 256:15                | tri-office 217:6             | 113:17 128:12                                 | 230:2                    |
| tourism 22:12       | transitioning         | 267:12                       | 156:6 164:18,21                               | <b>TV</b> 285:11 307:8   |
| 29:15 336:2         | 255:13,18 256:14      | troops 113:19                | 172:15 197:2                                  | <b>Twenty</b> 351:12     |
| tourists 304:10     | translate 172:19      | tropical 259:8               | 206:13 220:8                                  | <b>twice</b> 349:8,10,10 |
| tow 341:22 342:21   | 211:22 398:5          | troposphere 232:8            | 254:19 268:11                                 | <b>two</b> 9:9 10:11,14  |
| 344:9 346:19        | translates 106:9      | 232:12.16                    | 302:22 304:17                                 | 17:17 20:4,9,12          |
| towed 189:16        | transponder 285:3     | tropospheric                 | 311:13 319:22                                 | 35:10 39:4 52:10         |
| 344:16              | 285:6                 | 232:22                       | 330:21 332:16                                 | 69:13 71:17 82:11        |
| towing 2:5 4:19     | transponders          | trouble 363:8                | 335:7 360:11,17                               | 86:12,22 89:12           |
| 306:14,16 343:9     | 282:3                 | troubleshoot 37:5            | 362:22 364:10                                 | 111:14 112:7,10          |
| town 276:11         | transport 141:2       | <b>true</b> 10:20 127:7      | 375:16 378:22                                 | 118:9 127:12             |
| tows 292:3 342:4    | transportation        | 154:5 199:10                 | 379:18 395:17                                 | 131:6 142:2 148:3        |
| track 123:19,21     | 13:20 15:21 18:15     | 233:17 363:20                | <b>tsunami</b> 14:4 20:11                     | 150:6 151:6              |
| 180:1 206:7         | 25:12,14 89:17        | truly 55:19 372:10           | 20:17,22 121:6,11                             | 158:14 169:16            |
| 234:10 282:10       | 90:5,9,14 152:9       | 372:13                       | 124:18 126:22                                 | 180:6 181:21,22          |
| tracking 282:8      | 326:21 351:7,9        | trumps 131:19                | 127:3,5 159:19                                | 182:3,6 188:1            |
| 284:12 285:5        | 354:21 355:17         | trust 49:17 60:19            | 179:20 180:1,6                                | 190:7 194:12             |
| tracks 123:14       | travel 386:11         | 61:6 62:18 63:4              | 181:21 247:13,14                              | 232:9 242:16             |
| trade 48:13 49:4,22 | traveled 383:8        | 63:15 64:6,22                | 247:17,19,20                                  | 243:2 245:1,15           |
| 50:5 66:20 101:10   | traveling 280:14      | 65:9 66:1 67:22              | 248:2,10 249:2,9                              | 250:10 252:2             |
| 103:1 307:4,8       | treasures 371:5       | 68:1,3,14,19 69:3            | 258:2,4,6,7 259:1                             | 255:12 257:16            |
| 103.1 307.4,0       | u casul cs 3/1.3      | 00.1,3,14,19 09.3            | 230.2,4,0,7 239.1                             | 233.12 237.10            |
|                     | l                     |                              | l   |                          |

| 267.5 260.4              | <b>UH</b> 360:3        | 206.6 245.20             | undata 4.5 177.22        | 207.12 200.14              |
|--------------------------|------------------------|--------------------------|--------------------------|----------------------------|
| 267:5 269:4              |                        | 206:6 345:20             | <b>update</b> 4:5 177:22 | 327:13 329:14              |
| 273:16,17 276:3          | <b>ultimately</b> 35:2 | 372:12                   | 179:1 209:13,16          | 361:2 376:15               |
| 280:13,13,17             | 38:18 69:8 393:17      | unemployment             | 215:21 222:19            | 381:10 383:4               |
| 283:14 286:17            | unacceptable 25:2      | 23:7                     | 236:4 245:18,22          | 391:15,16,17               |
| 289:19 291:12            | unanswered 352:8       | <b>UNESCO</b> 370:1      | 267:21 285:22            | 392:1,2 393:3              |
| 306:18 312:18,19         | 352:19                 | unexpected 158:5         | 327:11 379:19            | 396:6                      |
| 324:15 339:5,11          | uncertain 365:12       | unfortunately            | 380:2                    | <b>useful</b> 101:7 103:18 |
| 339:12,20 341:9          | uncertainties          | 42:19 198:18             | updated 215:2            | 104:4 106:13               |
| 344:3 349:13             | 238:16                 | 234:4 291:6              | updates 4:9 212:13       | 110:16 138:4,15            |
| 350:2 354:5              | uncertainty 56:3       | 313:21                   | 315:5                    | 139:7 158:21               |
| 357:19 358:3             | 56:17 57:21            | <b>unified</b> 390:20    | updating 191:10          | 216:18 250:6               |
| 364:14 378:1,2           | uncharted 128:17       | <b>Union</b> 91:7 169:11 | 211:9,10                 | 282:11 285:16              |
| 380:15 395:12,20         | <b>unclear</b> 276:8   | 200:16                   | upgrade 239:19           | 362:8                      |
| 400:18                   | uncommon 347:2         | <b>unique</b> 10:7 12:10 | 270:5 395:17             | usefulness 258:10          |
| tying 122:12             | undergoing 206:5       | 14:14 119:17             | upgraded 239:14          | <b>user</b> 149:22 151:20  |
| <b>type</b> 43:3 68:18   | underneath 218:4       | 229:8                    | 249:18 256:21            | 152:2,12,22                |
| 94:20 99:18 100:3        | 241:5,22 257:21        | <b>unit</b> 97:11 153:2  | upgrades 267:3           | 173:12 190:17              |
| 131:16,21 180:10         | understand 9:2         | 326:22                   | upgrading 45:13          | 214:10 226:15              |
| 183:20 185:21            | 12:16 15:8,15          | United 10:19 15:20       | 395:15                   | 379:19 392:17              |
| 194:11 230:13            | 16:17 17:13 18:14      | 65:6 74:5 77:22          | uplands 82:19            | 393:8                      |
| 259:6 307:15             | 19:4 43:22 58:19       | 101:2 102:3              | <b>uplift</b> 213:14     | users 65:19 80:2           |
| 308:9,10 324:20          | 83:15 102:17           | 146:15 149:5             | <b>upriver</b> 239:3     | 98:5,10 99:16              |
| 324:22 331:9             | 119:12 126:2           | 227:4 233:6 314:4        | <b>upwards</b> 344:18    | 134:22 135:1,1             |
| 345:9,14 348:7           | 159:1 170:19           | 320:21 382:13            | <b>USCG</b> 4:20         | 137:9 153:13               |
| 351:6 354:15             | 227:22 229:15          | 383:17 391:7             | <b>use</b> 7:12 47:10    | 177:11,13 185:5            |
| 355:14 377:10            | 244:17 288:1           | universities 95:18       | 56:19 61:2,13,16         | 195:21 214:5,13            |
| 392:9 393:2              | 308:15 336:10          | 391:10                   | 61:19 64:6 67:5          | 222:5 229:18               |
| 398:19                   | 338:16 351:5           | university 14:18         | 68:13 70:8 71:3          | 250:15 274:6               |
| types 12:8,8 42:5        | 358:22 366:2           | 25:21 26:2,3,9,10        | 72:18,18 73:10           | 276:18 277:8               |
| 44:13 65:11 66:20        | 387:7                  | 27:5,14 69:1             | 103:1,2 107:13           | 289:15 299:7               |
| 80:2 97:19 138:7         | understandable         | 74:13 75:13 77:1         | 121:21 133:9             | 347:15 352:18              |
| 138:8 153:7              | 22:8,10                | 77:13 82:5,8             | 138:9 140:14,22          | 363:11 391:6,12            |
| 237:20 238:6             | understanding          | 191:20 234:8             | 141:5,22 145:22          | 391:15,19,20               |
| 277:9 342:3 373:5        | 31:19 44:8 95:17       | 359:11,20 361:15         | 148:15 152:5,7           | 399:7,19,20                |
| 373:7 374:3              | 124:21 125:2           | 364:9 379:4              | 162:14 167:2             | uses 41:8,8 83:11          |
| 398:16 400:2             | 145:1 170:21           | unleaded 343:6           | 168:5,9 195:5            | 154:19 161:20              |
| typhoon 259:7            | 173:2 175:17           | unlimited 205:20         | 197:2 217:12,12          | 185:5 217:14               |
| typical 400:5            | understands 25:7       | unmanned 97:20           | 227:13 232:3,3,22        | 236:2,3 243:19             |
| <b>typically</b> 182:6,7 | understated 122:21     | UNOLS 191:14,20          | 233:22 239:1             | 244:12 265:2               |
| 182:20 192:1             | understood 15:11       | unpredictable            | 240:17 244:5             | <b>USGS</b> 228:7,11,16    |
| 193:1 222:12             | 44:9 45:7              | 308:17                   | 246:3 248:3              | 239:2,11,13,19             |
| 320:13 328:7             | undertake 13:16        | unsightly 335:4          | 264:22 265:4             | 240:11,18 376:2            |
| 386:11 388:19            | undertaking 42:19      | unstructured 92:5        | 269:5 276:20,21          | usually 183:20             |
| <b>T-AGS</b> 381:19      | underwater 372:9       | <b>unusual</b> 287:11    | 278:14 293:4             | 231:15 241:22              |
| <b>T-A-B-L-E</b> 4:1 5:8 | 373:2                  | 358:19                   | 296:22 303:4             | 245:12 250:9               |
|                          | underway 46:6          | upcoming 222:7           | 319:4 321:3              | 274:15 339:7               |
| U                        | 190:2 205:13           | 223:1                    | 326:13 327:9,11          | Utilities 342:20           |
|                          |                        |                          | · ·                      |                            |
|                          | 1                      |                          | 1                        | 1                          |

Г

| utility 149:16 389:1       | valued 14:9 219:8              | vessel 77:6 80:3                          | <b>visits</b> 194:3 400:12                        | 63:20 66:22 67:1                   |
|----------------------------|--------------------------------|---|---|------------------------------------|
| utilization 144:17         | 219:16                         | 97:16 136:3,12                            | visually 285:14                                   | 70:6,11 86:4 92:4                  |
| <b>utilize</b> 282:21      | values 120:8                   | 150:5,6 160:16                            | vitality 15:4                                     | 92:6,12,19 93:13                   |
| 285:12 289:17,21           | 368:14                         | 162:14 163:5,7                            | vitally 13:17                                     | 93:18 94:11 100:6                  |
| 360:19                     | Vancouver 75:9                 | 165:13,19 183:9                           | <b>voice</b> 298:19                               | 100:8 104:3                        |
| <b>utilized</b> 144:2      | 115:11                         | 183:18 184:4                              | 361:19  | 106:22 114:14                      |
| 220:10 283:7               | vapor 232:15 233:1             | 189:18 190:12                             | <b>volcano</b> 127:13                             | 115:13,21 116:8                    |
| 311:11                     | 233:6,13,19                    | 191:16 203:2,4                            | volcano-observing                                 | 123:18,20 125:6                    |
| utilizing 285:2            | 234:11                         | 206:7 255:8                               | 127:12  | 127:18 146:9                       |
| 360:8                      | variability 365:13             | 301:13 328:17                             | <b>volume</b> 204:19                              | 166:4,4,7 169:1                    |
| <b>U.S</b> 1:1 2:4,8,14,19 | varies 240:4                   | 338:1,13                                  | voluntary 274:14                                  | 174:4,21 176:4,16                  |
| 2:21,22,22 3:11            | variety 40:15 42:5             | vessels 49:10 57:17                       | <b>votes</b> 86:10                                | 187:13 190:10                      |
| 5:19 80:3 91:9             | 44:4 76:13 241:14              | 65:5 131:4,7                              | voting 86:6 87:21                                 | 191:5,6 211:17                     |
| 132:20 133:20              | 262:14 281:1                   | 140:18 156:18                             | <b>voyage</b> 308:4 312:3                         | 212:14 216:13                      |
| 140:22 147:22              | 329:16                         | 160:18 162:2,18                           | 312:9   | 228:18 229:19                      |
| 178:20,22 195:1,3          | various 11:17 12:8             | 179:9 181:12                              | vulnerability                                     | 246:16 279:20                      |
| 195:4,5 196:8              | 66:20 80:2 193:10              | 187:18,21 188:5                           | 372:19  | 287:16 302:9                       |
| 207:22 210:8,19            | 329:12 330:22                  | 191:13,21 192:10                          | vulnerable 41:10                                  | 305:13 309:10                      |
| 211:10 212:8               | 362:5 367:14                   | 206:7,12 253:21                           | W   | 310:21 323:5                       |
| 217:20 219:10              | 373:5                          | 278:21 280:21,22                          | $\overline{\mathbf{W}}$ 1:20                      | 324:14 332:13                      |
| 254:4 255:10               | vast 288:7                     | 281:19,22 282:4                           | waded 87:12                                       | 336:13 341:15                      |
| 259:17 263:6,18            | vastness 374:2                 | 286:18 317:12                             |   | 348:12 354:9                       |
| 267:13 278:20              | <b>VDatum</b> 189:7            | 336:5,7 341:10                            | <b>Waikiki</b> 1:15 336:2<br><b>Waimea</b> 343:20 | 361:9 363:15,15                    |
| 290:13,17 294:8            | 211:19,22 212:11               | 342:4 344:8                               | wait 27:10 142:11                                 | 363:16 365:8                       |
| 333:8 338:1,3,3            | 224:3 238:12,15                | 370:19 381:20                             | waited 20:12                                      | 368:18 380:8                       |
| 381:9,11 382:4,10          | 238:16 240:6                   | 386:17                                    |   | 387:10 392:1,19                    |
| 382:17,21 386:14           | 267:19                         | vetted 272:4                              | waiting 54:7<br>142:11 292:13                     | 393:4                              |
| 392:18                     | vector 17:19,22                | viable 330:15                             | 305:12 345:22                                     | wanted 88:21 89:9                  |
| <b>V</b>                   | 18:2                           | vice 1:19 78:19,22                        | Wake 258:18                                       | 107:4 111:12                       |
| vague 21:2 121:9           | vegetation 373:1               | 154:10 226:10                             | 294:21 295:1                                      | 132:1 135:21                       |
| Valdez 366:17              | <b>vehicle</b> 145:17          | 299:7 340:7                               | 294.21 295.1 296:1,2                              | 171:18,20 174:22                   |
| valid 110:13               | 380:10                         | <b>view</b> 23:13 65:19                   | walk 8:17 192:21                                  | 175:12 209:17                      |
| validate 159:9             | <b>vehicles</b> 139:16         | 139:4,5 197:7,10                          | 275:9,10 402:12                                   | 210:3,16 241:7                     |
| 217:9 221:20               | 140:7 170:5                    | 399:16                                    | 402:19,20,21                                      | 249:16 261:3                       |
| 231:8 260:7                | <b>velocities</b> 248:21       | <b>villages</b> 186:16,19<br>Vingin 224:4 | walked 304:2                                      | 289:7,12 290:21                    |
| validated 267:20           | 248:22 249:1                   | Virgin 224:4<br>Virginia 2:12 86:1        | 368:12  | 293:7 298:12<br>299:4 321:12       |
| validating 215:13          | velocity 249:5<br>Ventura 74:9 | 176:1 216:1 237:9                         | walking 401:17                                    | 327:6 328:5                        |
| 238:9                      | ventura 74:9<br>versa 340:7    | 246:2 296:8                               | wall 242:15 297:8,8                               | wanting 352:3                      |
| valorem 65:4               | version 107:4                  | virtual 21:9                              | 307:12  | wanting 552:5<br>wants 55:22 73:12 |
| valuable 391:18            | 194:16                         | virtual 21:9<br>virtually 99:12           | <b>Walnut</b> 317:3                               | 86:19 187:2                        |
| value 65:4 120:10          | versus 29:7 96:8               | 338:17                                    | wandering 31:15                                   | 346:11                             |
| 168:1,8,11 173:19          | 97:13 118:14                   | visibility 251:22                         | want 8:21 9:6,19                                  | warehouse 288:10                   |
| 191:9 218:15               | 318:7 328:19                   | 252:11                                    | 18:20 28:8 29:15                                  | 345:18                             |
| 219:2,5 259:4              | vertical 83:18                 | vision 84:19                              | 29:16 37:1,4 43:4                                 | warehousing                        |
| 276:21,22 277:4            | 210:20 220:1,20                | visit 401:1                               | 51:3 59:13,14,17                                  | 312:12,13                          |
| 391:15 393:2,7             | 221:2 235:16                   | visiting 340:11                           | 60:11 61:13,16                                    | warfare 388:18                     |
|                            | 221.2 233.10                   | visiting 340.11                           |   | w <b>ai iai v</b> 300.10           |
|                            |                                |   |   | I                                  |

watermark 265:19 305:9 308:6,18 190:2 280:8,13,13 197:6 199:21 warm 248:22 293:17 312:18 warning 14:4 20:22 waters 132:20 318:20 335:6 200:5.15 201:1 21:6 127:3 258:2 178:20 195:1,6 338:2,16 340:18 339:4 349:8,9,10 202:10,16,19 258:4 259:1 196:9 339:2 361:6 362:6 349:11,12,12,15 203:10 205:19 warnings 20:20 381:11 382:4,10 363:12,18 370:17 349:16.17 206:19 226:7 washed 203:19 382:17,21 386:14 371:19 384:22 weekend 312:19 231:20 234:14 303:15 337:1,10 waterway 76:12 weekly 130:10 252:9,11,14,18 385:6 403:1 Washington 18:18 waterways 2:4,14 ways 64:16 84:11 weeks 20:10,12 269:14,17 271:16 66:16 75:9 79:21 4:21 314:8 114:13 117:10 53:15 127:12 272:19 273:6 102:21 115:12 Watson 3:17 10:3 166:22 241:14 279:11 312:19,20 274:2,11,22 275:6 148:5 181:4 324:2 30:22 31:6 81:21 244:1 268:22 339:5 344:4 275:20 276:6,13 278:9 300:3 324:4 81:21 87:6,9 349:14 372:21 290:5 292:13 wasn't 39:16 175:10,20 274:21 304:14.19.21 weigh 62:21 298:1 305:22 136:14 160:21 275:3,8,16 369:3 310:7 340:10 Welch 1:17,19 6:3 313:11 316:3 186:3 199:1 268:9 381:3 400:13 365:14 396:10 6:7 11:8 13:4 321:18 323:7 270:11 279:13 401:6,10,15 402:2 19:16 23:17 24:1 324:11 326:12 wealth 369:17 368:21 386:18 402:9,17 weapon 387:21 24:4 25:19 27:11 327:21 328:11 waste 142:9 161:10 wave 42:4 246:22 weapons 279:6 28:10 30:14,17 329:18 330:17 wasteful 142:10 247:2,13,21 248:2 382:12 52:14,17,20 54:6 331:11 333:6 wasting 68:16 248:10 249:2,7 wear 401:8 54:11 56:6.10 334:19 337:12 watch 184:3 316:13 271:20,21 272:11 weather 83:17 60:14 64:20,21 338:9,15 339:9 340:2,11 341:3,7 watched 183:17 272:15.18 66:15 69:7 70:17 99:13,14,19 **watching** 286:22 waves 246:12 148:22 182:9 71:9,18,22 73:2,5 341:12,16,20 water 15:9,13 251:22 272:14 184:2 189:1 75:7 79:19,19 349:20 350:22 44:21 45:14 70:12 351:13,15 353:8 343:21 216:12 230:3 87:14 90:7 92:21 74:18 76:11 78:12 way 15:2 26:8 231:4,7,16 233:2 93:6 94:15 102:8 354:5 355:20 129:22 131:10 32:22 36:5 45:1,1 233:14 243:18,20 361:21 362:16 103:11 104:10,18 134:2 181:19 49:21 59:3 70:20 245:13 251:15,16 106:3,20 109:7 363:7 365:4,8 200:21,21 204:3 74:22 84:3 97:10 255:16.18 256:9 115:1 116:7 366:3 367:1,13 204:14 213:7,9,17 97:11,14 98:17 259:9 260:1 289:4 118:21 121:3 368:6,10,14 369:4 114:7 116:15 293:4,6 295:7,8 122:17 126:4.20 215:19 218:1 371:7 373:4,12 232:15 233:1,6,13 123:8,9 124:12 301:9,9,20,22 127:9 132:11 374:1,17 376:4 233:19 234:11 137:18 145:16 302:4 311:18,22 133:4 137:2,8 377:15 378:18 235:17 241:3 149:20 155:20,21 317:21 343:16,17 141:11 143:7 380:21 385:3 244:3,5,8,12,13 157:19 158:6 343:18 344:21 145:3 146:2,7 386:7 388:8 244:15,19,19 165:2 171:4,11 345:19 149:17 151:17 389:12,15 391:2 247:15 248:15,18 183:19 186:4 weatherman 307:7 153:5,13,16 392:5 394:11,16 249:10 259:14 198:10 205:3 web 391:12 157:22 158:20 394:21 396:8,13 262:12 264:20 206:2 214:4 220:9 website 147:11,16 159:7 160:5 161:5 396:18 398:12 162:16 164:12 401:3,7,21 402:13 268:12,15,16 221:3 235:11 187:3 211:21 286:4 287:13 240:22 255:20 214:22 217:1,3 165:8 166:16 403:4 307:12 320:15 258:22 264:4 249:18,19 250:7 167:11,17 169:21 welcome 8:15 356:22 360:15 271:6 278:14 360:4 364:17 170:7 171:17 11:10 12:19 13:8 285:4 286:2 288:5 wedding 20:6,8,13 174:1 175:2,16,21 52:2,8 176:18 369:16 370:8 371:21,21 379:4 WEDNESDAY 176:6 177:3,20 177:12 275:17,19 295:18 296:11,18 392:11 298:20 300:21.22 178:8,12 179:12 277:19 298:15 1:11

> Neal R. Gross & Co., Inc. 202-234-4433

week 49:7 129:20

303:5,16 304:16

waterfront 20:9

369:5 389:14

182:2,13 183:3

|                              |                                    | 1                                      | 1                           | 1                     |
|------------------------------|------------------------------------|--|-----------------------------|-----------------------|
| Welcoming 4:5                | 33:11,15 34:6,11                   | 288:5 291:5                            | 285:8 287:18,18             | 347:2,4,7 348:11      |
| Wells 28:13,14               | 34:12 35:11,17                     | 292:10,13 293:17                       | 300:3 302:17                | 361:10,11 391:22      |
| 83:6,14 124:16               | 36:4,4 37:15                       | 294:13 297:19                          | 307:20 314:7                | windmill 42:3         |
| Wellslager 1:19              | 39:17 41:4,21                      | 299:4 302:13                           | 318:18 329:6,12             | window 192:3          |
| 78:19,20 154:10              | 43:6 44:11,12,12                   | 307:10,11 312:2                        | 331:9 345:3                 | 346:1                 |
| 154:11 226:10                | 44:22 46:12,17                     | 312:18,20 317:13                       | 346:16 347:20               | winds 307:4,5,8       |
| went 21:18 38:20             | 47:7,14 51:11,12                   | 319:22 321:16                          | 355:3 360:11                | 346:6 358:6,9,12      |
| 116:5 135:17                 | 53:13 55:2,11,17                   | 323:1 327:2 336:8                      | 366:10,16,21                | 358:14,19             |
| 137:16 150:8                 | 58:7,8,9,10 59:8                   | 340:11 341:21                          | 375:15 376:1                | <b>winners</b> 243:7  |
| 160:10 176:21                | 60:9 61:10 64:1                    | 344:6 349:15                           | 378:13 379:3                | <b>winning</b> 169:10 |
| 181:5 201:8 258:7            | 66:7 69:13 70:3                    | 350:1,13 354:3                         | 380:5 386:21                | wintertime 288:21     |
| 260:21 261:1                 | 78:5 83:13 84:2                    | 356:21 360:12                          | 389:21 391:11               | wisdom 34:19          |
| 274:9 300:2                  | 86:8,16 87:20                      | 366:8 373:22                           | 398:14,17                   | wise 97:8             |
| 348:20 366:21                | 88:3 89:5 92:7                     | 377:2 378:6,7                          | whack 246:9                 | wish 354:20 382:17    |
| 403:11                       | 94:9 98:20 102:2                   | 380:8 388:20                           | whale 14:7 287:20           | wished 107:13         |
| weren't 93:7                 | 106:1 110:5                        | 392:18 393:6                           | 289:9 302:16                | withdrawal 218:1      |
| 332:11                       | 112:16 113:19,20                   | 400:15,17 401:16                       | whales 164:10               | withstand 242:10      |
| west 62:3 180:4,5,7          | 114:21 115:20                      | 401:17,21                              | 166:5 288:22                | witness 129:17        |
| 261:17 291:13,14             | 118:8,15 121:14                    | we've 9:1 11:16,18                     | whatnot 345:1               | 143:13                |
| 291:16 295:4                 | 139:20 143:12                      | 12:9 17:5 30:4.8                       | wheel 154:15                | <b>WLB</b> 317:1      |
| 371:16,20                    | 145:6 155:22                       | 38:13,16 46:18                         | whined 153:4                | woes 35:9             |
| Western 196:13               | 156:1,2,3,5,6                      | 47:20 48:22 49:18                      | whistles 249:20             | worder 20:14          |
| 363:3                        | 157:14,15 159:15                   | 50:7 54:19 55:6                        | 256:6                       | 121:5,20 198:6        |
| westward 295:11              | 166:5 167:5                        | 55:10 60:1 66:6                        | white 104:13,14             | 330:19                |
| westward 295.11<br>wet 170:6 | 172:10 174:12                      | 77:10 112:19                           | 307:14 315:9                | wondered 97:9         |
| we'll 7:8 8:17,22            | 172.10 174.12                      | 113:19 117:3                           | 348:3                       | 323:11 401:13         |
| 9:4,11 10:12                 | 183:21 184:10                      | 120:12 133:5,13                        | wide 348:14 349:5           | wonderful 394:2       |
| 21:22 31:12 35:1             | 188:13,14,15                       | 135:8 153:4 174:6                      | 371:18                      | wondering 178:13      |
| 35:2 87:15 88:9              | 188.13,14,13                       | 174:20 178:3                           | wife 291:1 310:14           | 203:22 325:1          |
| 88:15 104:11                 | 191:10 192:7,8                     | 180:3 183:5                            | 339:7                       | wood 23:8             |
| 119:2 150:2 160:1            | 191:10 192:7,8                     | 186:10.13 187:12                       | wildlife 2:22 152:4         | word 105:12 165:3     |
| 187:6,7,10 195:19            | 195.9 190.17                       | 188:2 189:1                            | 199:12 279:19               | 234:3 253:10          |
| <i>, ,</i>                   |                                    | 201:18 202:1                           | 302:15 372:6                |                       |
| 206:18 209:10                | 205:19 223:13<br>229:2 234:3 236:7 |  |                             | 262:17 315:17         |
| 212:12 226:4                 |                                    | 212:11 215:4,9,16<br>218:5 223:5 234:7 | 376:2 378:2,15              | 350:4,6               |
| 229:7 241:21<br>242:4 259:19 | 237:6 238:19                       |  | wildly 126:15               | words 95:20 154:3     |
|                              | 240:4,17 241:13                    | 239:6,10 240:9                         | <b>William</b> 366:18       | 158:6 213:11          |
| 269:8 274:5                  | 241:20 243:5,7,22                  | 241:9,11 245:21                        | <b>willie-willie</b> 346:10 | 237:8 342:3           |
| 277:11,17 291:9              | 244:3,20 245:2                     | 251:1 252:7                            | willing 51:4 276:15         | wordsmithing          |
| 293:22 298:2                 | 251:8 255:17,18                    | 253:18 254:3                           | 323:1 334:5 380:8           | 155:18                |
| 335:13 339:3                 | 256:13 259:2                       | 255:13 256:6,14                        | willingness 31:20           | work 12:18 13:11      |
| 340:16 345:20,21             | 261:4 262:4,8,19                   | 261:12 262:11                          | 125:17                      | 13:16,19 15:18        |
| 350:20 402:7                 | 264:12,15 265:2                    | 263:18 268:11,22                       | <b>Wilson</b> 76:7 151:19   | 16:3,16 18:21         |
| 403:7                        | 267:6 271:4                        | 270:9,21 271:12                        | win 37:16 91:9              | 19:9,10 21:7          |
| <b>we're</b> 6:21 8:4,7      | 272:14 273:18                      | 272:5 277:22                           | wind 42:9 114:6             | 23:12 24:7 25:12      |
| 14:2 16:18 23:8,9            | 274:6 275:3                        | 278:12 281:11,18                       | 144:1 287:7                 | 29:22 30:11 32:18     |
| 25:10 26:20 27:2             | 280:12 283:7,17                    | 282:5,6 283:6,8                        | 301:22 307:18               | 34:3 37:13,14         |
| 27:4,9 28:4 32:20            | 284:8 285:8 287:3                  | 283:10 284:22                          | 312:7 346:2,14,16           | 46:7,10 52:6          |
|                              |                                    |  | l                           |                       |

|                               | 1                     | 1                              | 1                          |                              |
|-------------------------------|-----------------------|--------------------------------|----------------------------|------------------------------|
| 54:19 58:4 62:4               | 223:3,9 229:13        | 45:21 53:2,13                  | 260:16 263:8,13            | <b>\$8</b> 21:21 375:7       |
| 62:15,22 69:9                 | 234:7 239:6,10,15     | 65:10 68:7 72:22               | 264:7 269:4 270:7          |                              |
| 74:15 75:14 76:5              | 262:8 264:12          | 74:10 77:17 80:11              | 270:10 278:3,13            | #                            |
| 77:2,21 78:10                 | 314:6 317:14,15       | 81:6,18 91:8                   | 279:2 281:11               | <b>#1</b> 147:2              |
| 85:18 86:2 93:21              | 319:20 334:9          | 93:20 109:9 118:8              | 290:19 301:11              | <b>#2</b> 159:4              |
| 95:14 96:18 117:6             | 339:8 352:6           | 127:10 128:5,5                 | 304:3 314:9                | <b>#5</b> 129:21 131:10      |
| 130:18 131:8                  | 364:13,17 376:1       | 131:7 133:21,22                | 335:17 348:12,13           |                              |
| 139:14 141:14                 | works 231:10          | 141:22 142:14                  | 352:12 366:11              | $\frac{0}{2}$                |
| 155:19 173:5                  | 264:4 315:6,8         | 157:5,8,8 159:20               | 373:17 395:20              | 0.40 295:15                  |
| 181:1,13 185:22               | world 26:7 75:22      | 161:11 182:9                   | 397:4                      | <b>0.70</b> 295:17           |
| 188:7 189:8,14,20             | 112:19 118:7          | 184:7 190:5,12                 | <b>year's</b> 225:2,6,11   | <b>0300</b> 348:2            |
| 193:4 198:18                  | 128:3 131:20          | 195:16 202:1                   | year-to-year 240:4         | <b>0545</b> 348:2            |
| 199:10 204:12                 | 140:15 146:22         | 211:3 219:17,22                | <b>yellow</b> 249:4        | <b>07</b> 109:21             |
| 208:7 214:8 216:7             | 148:1,1,3,6 171:3     | 221:14 222:8                   | yesterday 230:10           | 1                            |
| 216:14 220:17                 | 195:2 293:5 324:2     | 224:2,5 225:1,6,7              | 258:8,9 334:1              | $\frac{1}{135:1139:4111:19}$ |
| 223:11 227:9                  | 370:2                 | 225:7,19 226:3,5               | 353:11                     | 114:16 306:7                 |
| 235:13 243:7                  | worldwide 118:12      | 237:22 238:13                  | <b>York</b> 149:6,7,9      | 350:18                       |
| 259:22 261:13                 | worth 21:21 71:4      | 240:1 245:5,20,20              | 150:11 245:22              | <b>1st</b> 53:2,6,22         |
| 262:22 279:16                 | 132:8 173:16          | 249:17 250:10                  | <b>Young</b> 342:18        | <b>1,000</b> 179:4 202:21    |
| 280:13,18 281:5               | 178:13 243:1          | 253:14 254:22                  | 349:7 394:22               | <b>1.00</b> 295:17           |
| 301:7,8,12 302:14             | 359:21                | 255:11 259:22                  | <b>Youth</b> 14:21         | <b>1:00</b> 176:19           |
| 306:10 309:5,21               | worthwhile 146:1      | 260:4,13 261:9,16              | Z                          | <b>1:04</b> 176:22 177:2     |
| 311:8 320:22                  | wouldn't 20:12        | 264:17 265:17,19               |                            | <b>10</b> 101:4 189:2        |
| 333:4 336:10                  | 160:2,13 327:11       | 269:10 281:5                   | <b>zero</b> 366:9          | 201:7 211:3                  |
| 337:21 338:8                  | wrangle 55:18         | 289:5 290:20                   | <b>zeroed</b> 127:3        | 224:13                       |
| 359:19 362:15                 | wrap 71:10 88:9       | 317:16 373:20                  | zero-based 384:4           | <b>10,000</b> 307:2,5        |
| 364:10,19 366:19              | 174:3                 | 375:12,13,13,14                | <b>zero-sum</b> 157:9      | <b>10:30</b> 350:11          |
| 367:10 373:19,20              | wreck 130:11          | 376:18 377:3                   | <b>zones</b> 167:1         | <b>10:45</b> 116:5           |
| 374:3,8 380:13                | 187:15                | 384:3 386:16                   | <b>zoning</b> 43:3 238:5   | <b>100</b> 154:13 155:11     |
| 383:14,18 390:9               | wrecks 130:13,15      | yearly 211:13                  | \$                         | 196:7 282:9                  |
| 399:20                        | 181:17                | years 6:16 8:21                | <b>\$1.3</b> 23:11         | 348:14 349:4                 |
| worked 21:7 77:9              | write 395:2           | 11:16 24:13 35:10              | <b>\$1.4</b> 24:22         | 371:18                       |
| 81:9 98:18 130:7              | writing 144:10        | 38:4,10 61:6 65:7              | <b>\$100</b> 296:12,14     | <b>100K</b> 379:12,20        |
| 174:12 175:4,7                | 373:18 395:4          | 65:7 73:3,8 79:21              | <b>\$100,000</b> 375:14,21 | <b>101</b> 207:8 388:3       |
| 218:5 256:12                  | written 92:22         | 80:6,21 81:8,9                 | <b>\$199</b> 169:13        | 11 33:20,22 35:5             |
| 257:12 263:18                 | 395:2                 | 83:10 96:20 98:13              | <b>\$2.4</b> 219:8         | 37:12 53:12,18               |
| 264:3,8,8,10                  | wrong 29:17 150:9     | 108:7,11,13                    | <b>\$20</b> 21:20          | 54:8,8 109:19                |
| 278:7 290:17                  | 150:22                | 110:17 116:19<br>132:19 138:16 | <b>\$200</b> 57:9          | 201:14 202:1                 |
| 302:17 326:7<br>374:18 400:21 | wrote 112:21          | 132:19 138:10                  | <b>\$25</b> 164:13         | 224:14 225:11                |
| working 16:18 21:5            | X                     | 191:17,18,18                   | <b>\$3</b> 253:15          | 257:13 266:13                |
| 26:20 27:4 33:15              | <b>X</b> 163:14 168:7 | 195:18 198:7                   | <b>\$3.8</b> 265:12        | 267:8 369:21                 |
| 51:11 79:5 94:1               | 270:7 317:16          | 205:16 207:21                  | <b>\$30</b> 21:20          | <b>11:00</b> 116:3           |
| 129:22 156:1,18               |                       | 208:22 209:11                  | <b>\$34</b> 265:12         | <b>11:05</b> 116:6           |
| 178:3 181:3 190:3             | Y                     | 212:12 214:12                  | <b>\$50</b> 57:8           | <b>1100</b> 350:20           |
| 195:20 207:15                 | yards 341:11          | 239:7 246:7                    | <b>\$522</b> 219:21        | <b>12</b> 34:20 35:7 37:14   |
| 212:11,15 213:4               | year 23:14,16         | 252:16 256:21                  | <b>\$750,000</b> 17:16     | 53:10 120:1 180:1            |
| 212.11,13 213.4               | 34:15,18 35:4         | 232.10 230.21                  | <b>\$758</b> 219:16        | 188:20 201:10                |
|                               | Í                     | l                              |                            | I                            |

|                             | I   | I   | 1                                   |  |
|-----------------------------|---|---|-------------------------------------|--|
| 211:3 221:17                | <b>1998</b> 298:9                             | <b>29</b> 268:18                              | 6                                   |  |
| 223:21 224:15,15            |   | <b>290</b> 4:17                               | <b>6</b> 240:16                     |  |
| 225:12 257:13               | 2   | <b>298</b> 4:18                               | <b>6,000</b> 348:15                 |  |
| 266:12,14 346:13            | <b>2</b> 22:15 114:18                         |   | <b>6:15</b> 402:19                  |  |
| 373:20                      | <b>2:43</b> 274:9                             | 3   | <b>6:30</b> 275:8                   |  |
| <b>12,000</b> 307:3         | <b>20</b> 80:6 81:8,9 83:9                    | <b>3</b> 22:15                                | <b>60</b> 178:13,15                 |  |
| <b>12:10</b> 176:21         | 88:15 90:11 91:21                             |   | 222:11 234:21                       |  |
| <b>120</b> 190:20           | 158:7 225:2                                   | <b>3.2</b> 130:17                             | 242:17                              |  |
| <b>1200</b> 371:18          | 265:14 301:19                                 | <b>3:04</b> 274:10                            | <b>65</b> 289:10                    |  |
| <b>13</b> 4:4 120:1 224:22  | 360:6 400:22                                  | <b>30</b> 65:7 82:13 190:5                    | <b>65,000</b> 343:5                 |  |
| 247:2 287:22                | <b>200</b> 161:13 208:22                      | 190:7 198:7                                   | 344:18                              |  |
| <b>130</b> 142:15 161:10    | 316:21  | 242:18 246:10                                 |                                     |  |
| <b>132</b> 4:10             | <b>2002</b> 81:17                             | 278:3,12                                      | 7                                   |  |
| <b>135</b> 142:3            | <b>2006</b> 371:15                            | <b>30th</b> 53:3                              | <b>7,000</b> 72:22                  |  |
| <b>136</b> 142:12           | <b>2007</b> 106:6                             | <b>30-something</b>                           | <b>70</b> 344:18                    |  |
| <b>14</b> 356:12 372:7      | <b>2008</b> 300:8,18                          | 79:21   | <b>700</b> 202:2                    |  |
| 14th 2:4 4:20               | <b>2009/2010</b> 218:19                       | <b>30-35</b> 346:15                           | <b>72</b> 4:6 201:21                |  |
| <b>140,000</b> 372:1        | <b>2010</b> 106:6 130:2                       | <b>300</b> 297:18                             | 8                                   |  |
| <b>15</b> 86:5 90:10 101:5  | 131:5 201:21<br>209:19 238:1                  | <b>300s</b> 344:11<br><b>306</b> 4:19         |                                     |  |
| 132:18 159:10,10            | 243:11 261:16,19                              | <b>31</b> 4:5                                 | <b>8</b> 346:13                     |  |
| 159:12,14 240:15            | 265:11,21                                     | <b>313</b> 4:21                               | <b>8:30</b> 1:16                    |  |
| 275:9 400:22                | <b>2011</b> 1:12 131:6                        | <b>3300</b> 296:20                            | <b>8:45</b> 400:18                  |  |
| 402:20                      | 2011:22 240:1                                 | <b>35</b> 240:2                               | <b>8:47</b> 6:2<br><b>80</b> 242:17 |  |
| <b>150</b> 263:8            | 266:1 268:7                                   | <b>35th</b> 81:6                              | <b>80s</b> 291:8                    |  |
| <b>16</b> 108:7,11,12 307:8 | <b>200</b> .1 200.7<br><b>2012</b> 53:4 266:8 | <b>367</b> 4:22                               | <b>800</b> 179:4                    |  |
| <b>1600</b> 219:14 222:10   | 267:6 283:5                                   | <b>369</b> 5:15                               | <b>85</b> 4:8                       |  |
| <b>17</b> 73:8 247:1        | <b>2013</b> 210:17                            | <b>38</b> 174:10                              | 0.0 4.0                             |  |
| 400:19                      | <b>2015</b> 222:19                            | <b>381</b> 5:19                               | 9                                   |  |
| <b>1700</b> 296:21          | <b>207</b> 4:12                               | <b>389</b> 5:22                               | <b>9</b> 4:2                        |  |
| <b>175</b> 267:13 295:4,4   | <b>21</b> 80:21 274:21                        |   | <b>9th</b> 113:7                    |  |
| <b>18</b> 22:12,14 307:8    | <b>210</b> 142:13                             | 4   | <b>9:00</b> 350:14                  |  |
| <b>180</b> 283:20           | <b>22</b> 290:19                              | <b>4</b> 1:12 242:11                          | <b>90</b> 155:18 190:21             |  |
| <b>1800s</b> 292:8          | <b>2200</b> 296:15                            | <b>40</b> 397:4                               | 342:7                               |  |
| <b>1807</b> 207:18          | <b>23.9</b> 130:17                            | <b>400</b> 344:13                             | <b>900</b> 202:8                    |  |
| <b>181</b> 243:12           | <b>234</b> 4:13                               | <b>43,000</b> 201:19                          | <b>93,200</b> 201:9                 |  |
| <b>1840s</b> 146:17         | <b>24</b> 180:1 268:18                        | <b>45</b> 92:14 328:17                        | <b>94,800</b> 201:8                 |  |
| <b>1850s</b> 146:17         | <b>240</b> 344:10                             | <b>46</b> 238:1                               | <b>95</b> 189:18                    |  |
| <b>1880</b> 147:15          | <b>25</b> 22:13 61:6 65:7                     | <b>48</b> 126:12,19 330:6                     | <b>96,400</b> 201:12                |  |
| <b>19th</b> 147:6           | 88:15 91:21                                   | 5   |                                     |  |
| <b>1900</b> 148:4           | 242:18  |   |                                     |  |
| <b>1940</b> 147:15          | <b>2552</b> 1:15                              | <b>5:20</b> 403:11<br><b>50</b> 190:19 299:21 |                                     |  |
| <b>1960s</b> 232:19         | <b>260</b> 344:10                             | <b>50K</b> 253:16                             |                                     |  |
| <b>1975</b> 306:7           | <b>264</b> 147:14                             | <b>50K</b> 255:10<br><b>52</b> 79:8           |                                     |  |
| <b>1976</b> 290:14          | <b>27</b> 83:7 202:7                          | <b>55</b> 299:22                              |                                     |  |
| <b>1979</b> 74:7 278:4      | 277 4:15                                      | <b>55,000</b> 344:17                          |                                     |  |
| <b>1992</b> 339:15          | <b>280</b> 344:11                             | <b>5700</b> 296:22                            |                                     |  |
|                             |   | 5700270.22                                    |                                     |  |
| L                           |   |   |                                     |  |

#### CERTIFICATE

This is to certify that the foregoing transcript

In the matter of: Hydrographic Services Review Panel

Before: NOAA

Date: 05-04-11

Place: Honolulu, HI

was duly recorded and accurately transcribed under my direction; further, that said transcript is a true and accurate record of the proceedings.

near A ans &

Court Reporter

## **NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS 1323 RHODE ISLAND AVE., N.W. WASHINGTON, D.C. 20005-3701