

U.S. DEPARTMENT OF COMMERCE

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NATIONAL OCEANIC AND
ATMOSPHERIC ADMINISTRATION (NOAA)
HYDROGRAPHIC SERVICES REVIEW PANEL

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PUBLIC MEETING

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THURSDAY, APRIL 9, 2015

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The Hydrographic Services Review Panel met in the Long Beach Hilton International Conference Room, 701 West Ocean Boulevard, Long Beach, California, at 8:30 a.m., Scott Perkins, Chair, presiding.

MEMBERS PRESENT

SCOTT R. PERKINS, HSRP Chair

WILLIAM HANSON, Vice Chair

ANDY ARMSTRONG*

LARRY ATKINSON

RADM KENNETH BARBOR

JULIANA BLACKWELL*

DR. LAWSON W. BRIGHAM

RADM EVELYN FIELDS

EDWARD J. KELLY

DR. FRANK KUDRNA

DR. GARY JEFFRESS

CAROL LOCKHART

DR. DAVID MAUNE

JOYCE E. MILLER

CPTN. SALVATORE RASSELLO

SUSAN SHINGLEDECKER

* Non-voting members

ALSO PRESENT

REAR ADMIRAL GERD F. GLANG, HSRP Designated
Federal Official

MICHAEL ASLAKSEN, Chief, Remote Sensing
Division, National Geodetic Survey, NOAA

CAPTAIN (sel) RICHARD BRENNAN, Chief, Coast
Survey Development Laboratory, NOAA

DANA CACCAMISE, Pacific Southwest Regional
Advisor, National Geodetic Survey, NOAA

CHRISTOPHER CANNON, Director, Environmental
Management, Port of Los Angeles

RUSSELL CALLENDER, Ph.D., Deputy Assistant
Administrator, National Ocean Service, NOAA

ASHLEY CHAPPELL, IOCM Coordinator, Office of
Coast Survey, NOAA

TOM CULLEN, Administrator, State of
California, Office of Spill Prevention

JEFF FERGUSON, California Navigation
Manager, Office of Coast Survey, NOAA

JIM HAUSSENER, Executive Director, California
Marine Affairs and Navigation Conference

TIFFANY HOUSE, Project Analyst, Remote Sensing
Division, National Geodetic Survey, NOAA

DAVID KENNEDY, NOAA Arctic Policy Advisor,
Office of the Undersecretary

BRANDON LINK, United States Coast Guard

AUDRA LUSCHER-AISSAOUI, Resilience Program
Manager, Center for Operational
Oceanographic Products and Services

LYNNE MERSELDER-LEWIS, HSRP Coordinator

RUSSELL PROCTOR, Chief, Navigation Services
Division, Office of Coast Survey, NOAA

PETER STONE, Technical Director, Center for
Operational Oceanographic Products
and Services

JOHN Z. STRONG, Vice President, Jacobsen Pilot
Service

BIANCA TERRY, Office of Assistant
Administrator, National Ocean Service, NOAA

JULIE THOMAS, Program Manager and Principal
Investigator, Coastal Data Information
Program

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P-R-O-C-E-E-D-I-N-G-S

8:35 a.m.

CHAIR PERKINS: Good morning. Welcome to day two of the 29th meeting of the Hydrographic Services Review Panel. We had an interesting day yesterday. Outstanding presentations. Graciously, we had the honor of having Representative Lowenthal from the 47th Congressional District of California address us yesterday morning. Distinguished panelists.

Wonderful field trip to the Marine Exchange yesterday afternoon and got a look at the complexity of the amount of vessel traffic coming into the Ports of Long Beach and LA, and then a waterside tour of these port facility. About half a dozen tanker ships at anchorage awaiting their approaching. Another dozen ships in the process of loading and unloading and shifting. A wonderful first-hand look at both the complexity and the size of the port facility here.

We have a full day in front of us

1 again here this morning, and just a small recap.

2 Admiral, do you need to do a safety
3 briefing again?

4 RADM. GLANG: Sure. Good morning.
5 I'm Gerd Gland, the designated federal officer.
6 This only applies to those folks in the room and
7 not online. But should we need to leave the
8 room, just go out the door and follow the main
9 hallway out to your right, down the escalator and
10 out.

11 There are other exits that are marked
12 should we need to find another way out, and of
13 course the facilities are just outside the hall
14 here And thank you for your attention.

15 CHAIR PERKINS: Yesterday we did a
16 brief introduction of the panelists at the table,
17 but due to the time limitations we didn't have an
18 opportunity for the support people here with us
19 to do an introduction. So if we could do a brief
20 introduction -- if you could do self-
21 introductions for the non-Panel members that are
22 here in support of the HSRP.

1 MS. LUSCHER-AISSAOUI: Good morning.
2 My name is Audra Luscher-Aissaoui. I'm with
3 NOAA's CO-OPS and I'll be presenting a little bit
4 more on resilience today.

5 MS. CHAPPELL: Good morning. Ashley
6 Chappell, NOAA Integrated Ocean and Coastal
7 Mapping and Office of Coast Survey, and I'll be
8 talking about Arctic and resilience today.

9 MR. ASLAKSEN: Morning. Mike Aslaksen
10 with the National Geodetic Survey. I'm Chief of
11 the Remote Sensing Division and I'll be talking
12 about NOAA operations supporting resiliency.

13 MR. FERGUSON: I'm Jeff Ferguson. I'm
14 Coast Survey's California Navigation Manager.

15 DR. CACCAMISE: I'm Dana Caccamise, a
16 Pacific Southwest Regional Advisor for the
17 National Geodetic Survey.

18 MR. PROCTOR: Good morning. I'm Russ
19 Proctor. I'm with the Office of Coast Survey and
20 also serve as Admiral Glang's alternate DFO.

21 MS. MERSFELDER-LEWIS: I'm Lynne
22 Mersfelder-Lewis and I am the program manager for

1 the HSRP.

2 MS. TERRY: I'm Bianca Terry. I'm
3 with the Ocean Service and I'm Dr. Callender's
4 staffer.

5 LCDR. LINK: Good morning. Brandon
6 Link with the United States Coast Guard here at
7 Sector Los Angeles/Long Beach and here
8 representing Captain Williams.

9 CHAIR PERKINS: Great. Thank you. A
10 couple panel business items before we get into
11 our presentations this morning.

12 So the Panel had a working group
13 tasked with reviewing the charter. The charter
14 of the HSRP is required to be renewed every two
15 years. That working group prepared a draft.
16 That draft has been circulated to all of the
17 Panel members, and at this point it would be
18 appropriate for us to see if there's any
19 discussion on that draft charter as presented.
20 And then following that discussion we would take
21 a simple voice vote to approve it as prepared and
22 submitted.

1 So discussion on the prepared draft
2 charter? Dr. Kudrna.

3 MEMBER KUDRNA: In reviewing the
4 document and in discussions, the issue came up
5 regarding subcommittees or working groups and our
6 ability to use outside individuals to provide
7 information to us.

8 And it was clarified by NOAA that we
9 are allowed to solicit information from outside
10 individuals, but based on the statute we could
11 not have them as sitting and voting members of
12 those committees. But our working committees or
13 subcommittees do have the ability to consult with
14 and obtain information from outside members. So
15 I wanted to clarify that to the Panel.

16 CHAIR PERKINS: Great. Thank you for
17 clarifying that, Frank.

18 So with that, I'll ask for a simple
19 voice vote. All in favor of presenting the
20 charter as you've received it, say aye?

21 (Chorus of aye.)

22 CHAIR PERKINS: Any opposed?

1 (No audible response.)

2 CHAIR PERKINS: Great. Thank you.

3 One other housekeeping issue that we
4 need to deal with. After the Charleston meeting
5 the official meeting minutes were produced and
6 there were some omissions in those minutes. So I
7 conducted --- as the Chair conducted the review
8 of the meeting minutes, and there were some
9 omissions that I didn't catch. So amended
10 minutes of the Charleston meeting have been
11 prepared. They have all been sent to you for
12 your review.

13 So in similar fashion the action
14 before us would be to adopt those amended minutes
15 from the Charleston meeting. So I'm going to ask
16 are there any comments or any additional
17 clarifications or corrections beyond the
18 amendment to the Charleston minutes?

19 (No audible response.)

20 CHAIR PERKINS: Okay. Hearing none,
21 I'm going to ask for a simple voice vote
22 accepting the amended Charleston minutes as

1 you've received them. So all in favor of
2 accepting those minutes, say aye?

3 (Chorus of aye.)

4 CHAIR PERKINS: Any opposed?

5 (No audible response)

6 CHAIR PERKINS: Great. I think that
7 concludes our business matters. And now we can
8 get to more important things, which is our Panel
9 presentation.

10 So with that, our first speaker is
11 Captain Richard Brennan, the Chief of the Coast
12 Survey Development Laboratory. And, captain?

13 CAPT. BRENNAN: I'm going to just come
14 over here so I can see what I'm doing a little
15 better. Let me start off with my presentation
16 first.

17 CHAIR PERKINS: While we take just a
18 minute to get the audio-visual rolling, this
19 gives us an opportunity to review the six
20 questions that Dr. Callender put in front of us.

21 The first of those being how does
22 coastal intelligence, the foundational

1 observations, models and mapping make coastal
2 resilience better?

3 The second being how do we leverage
4 the National Ocean Service foundational data
5 moving forward?

6 DR. CALLENDER: That second question
7 is really focused on the resiliency issue as
8 well.

9 CHAIR PERKINS: Yes. Great. In the
10 context of how it can complement the resilience
11 challenge facing the nation.

12 What criteria should we consider in
13 determining national charting priorities and
14 balancing the needs of maritime users with the
15 needs of coastal bathymetry?

16 That one I think really hit home after
17 our time on the water yesterday. And this Panel,
18 since I've been on it, we've had the opportunity
19 to see the Port of Anchorage, the facilities in
20 Norfolk and Charleston and New Orleans. And now
21 we've come here I guess to see the big dog in the
22 fight, the Port of LA and Long Beach.

1 We've heard about the critical
2 challenges facing each one of those facilities
3 and the challenges facing each one of them are
4 unique and different tied to their geographies,
5 but just the sheer size and complexity of what we
6 saw yesterday is -- it makes prioritizing -- the
7 challenge in front of us to prioritize these
8 missions I think is really going to be exciting
9 and a difficult challenge for us.

10 What are the ways in which navigation,
11 observations and positioning programs are good at
12 engaging stakeholders and how can NOAA better
13 connect and strengthen our relationship with
14 these stakeholders?

15 We heard from one of those
16 stakeholders yesterday afternoon during the
17 public comment period on the challenge facing GPS
18 continuity and eLORAN. So that ties in very
19 closely to question 5.

20 And what are the criteria we need to
21 consider in selecting the next 20 ports for
22 precise navigation and how should we prioritize

1 them?

2 I'm not sure I know what precise
3 navigation means, but I'm going to learn a lot
4 more about it in the presentation before us
5 today.

6 DR. CALLENDER: Scott, you actually
7 skipped number four, which is the criteria about
8 determining charting priorities in the Arctic and
9 how do we prioritize that work versus -- not
10 versus, but in light of the other priorities in
11 the lower U.S.?

12 MEMBER BRIGHAM: May I comment? The
13 United States is the chair of the Arctic Council
14 and the State Department has campaigned
15 internally to remind all Americans that in fact
16 we are an Arctic country.

17 So it's a great focus in the next
18 couple years, even more than normal, on trying to
19 educate the American public in Peoria, wherever,
20 on this topic. So it's also an opportunity for
21 even us to engage more on explaining why Arctic
22 is important for national security and economic

1 reasons.

2 CHAIR PERKINS: Thank you, Lawson.

3 Yes, Susan?

4 MEMBER SHINGLEDECKER: I just had a
5 quick question. When trying to provide input on
6 these questions regarding prioritization, I
7 personally am not currently aware of how the
8 areas that are currently charted are prioritized
9 within NOAA. So if there's any way we could get
10 a little more information on that, that might
11 help inform our answers here. Maybe I'm the only
12 one who doesn't know it.

13 MEMBER MILLER: I believe there's a
14 lot of information on the Survey website.

15 RADM. GLANG: Gerd Glang, Director of
16 Coast Survey. So that's a great question. We do
17 have material on that and we can review that this
18 afternoon during the breakout sessions, and then
19 Panel members can also dig in a little bit deeper
20 on that. Perhaps as part of the working group
21 work we can walk you through that process in a
22 little bit more detail, but we do have a

1 documented methodology.

2 MEMBER SHINGLEDECKER: Thanks.

3 CHAIR PERKINS: I skipped over Captain
4 Brennan's bio, so just give me a second here.

5 Captain Brennan served with the NOAA
6 Office Corps for 20 years sailing on nearly every
7 hydrographic ship in the modern NOAA fleet. He's
8 conducted surveys throughout the U.S. waters in
9 the Gulf of Mexico and the Caribbean, to the Gulf
10 of Maine and from the Oregon Coast to the Arctic
11 Ocean. Captain Brennan's most recent sea
12 assignment was the commanding officer of the NOAA
13 Ship Rainier serving in Alaska waters.

14 And I think we're getting very close
15 to having our audio-visual resolved, and Captain
16 Brennan is approaching the podium.

17 CAPT. BRENNAN: Okay. Take two. So
18 I apologize. Part of the reason that we got a
19 little bit sideways here is I really wanted to
20 show you a live demonstration, and that's always
21 a little dangerous when you're doing it in front
22 of an audience. So I accepted the risk on that

1 and I'll deal with the consequences, I guess.

2 So ultimately, as Scott mentioned, I
3 wanted to talk about precision navigation, and
4 certainly that's a term of art that's been
5 developed. I think certainly everybody
6 understands that at some level, or they think
7 that they understand what it is. And so I want
8 to, at least for the context of this
9 presentation, talk about that. But first, I want
10 to at least step us down through that.

11 So NOAA's focus is on providing timely
12 and accurate environmental intelligence to the
13 maritime community and delivering that data to
14 the location where the decision is made. So
15 environmental intelligence is a broad term and
16 again another term of art, but I think for us,
17 what we're talking about here is in precise
18 navigation is the ability to navigate where sea
19 room is limited in four dimensions: X, Y, Z and
20 time, and with statistical certainty. And we'll
21 talk a little bit more about what that
22 statistical certainty is today, but ultimately I

1 wanted to cast that out as far as what precision
2 navigation is.

3 So --- but I think we've seen what the
4 challenges are here at Long Beach, but I wanted
5 to at least take it a little bit more broadly
6 first because precision navigation means
7 different things in different ports. So it's not
8 going to look the same in every port that you go
9 to.

10 So for instance, this is an ore
11 carrier in the Great Lakes entering the locks.
12 And you can see by the minimal clearance that
13 they have on either side that the challenges that
14 they have here are not in the vertical, at least
15 not in this navigational instance. It's in the
16 horizontal, right? And so, how are they coming
17 in?

18 And so the things that affect that,
19 the environmental conditions, the environmental
20 intelligence that they're going to be pulling on
21 to make their decisions as they bring that ship
22 into that lock are going to be different than

1 perhaps this ship that's passing under the
2 Verrazano Bridge and it has an air draft
3 restriction. And so, it has a very tight
4 tolerance as it goes under that bridge.

5 That's different than if you're in the
6 Houston Ship Channel and you're doing the Texas
7 Chicken, for anybody who's familiar with that.
8 So you have bow cushion and stern suction issues
9 when those things pass. And so literally the
10 ships have to steer into each other for a brief
11 moment in time as they pass each other, or else
12 they'll literally be forced apart and collide
13 because of the pressure bulbs that are formed at
14 the bow of each of those respective vessels.

15 And then looking at that here in Long
16 Beach, and quite literally across all of our
17 ports, is the increase in draft that we have. So
18 all of our vessels are getting bigger, wider,
19 deeper, as we know, and so the issue is how do we
20 deal with that?

21 So when we start talking about
22 precision navigation, there are a number of

1 elements that feed into that. And so, in this
2 graphic on the left-hand side I'm talking about
3 forecasts and models. On the right-hand side I'm
4 talking about direct observations. And then in
5 the center, just because I'm a hydrographer, I've
6 got gridded bathymetry. That's the center of my
7 world, so that's where I put it here.

8 (Laughter.)

9 CAPT. BRENNAN: But, so when we talk
10 about that, we've got water level forecasts, wind
11 forecasts, wave forecasts, salinity forecasts,
12 and salinity is one that can be frequently lost
13 in the shuffle.

14 But in talking with pilots in
15 Charleston during our last visit there, one of
16 the things that they said was that salinity was
17 an issue because when they were calculating their
18 air drafts, they thought that the water would
19 become much more fresh sooner than it did. And
20 that salinity didn't change until after they got
21 through the bridge. So there was a very tense
22 moment as they passed under that bridge and had

1 significantly less air draft than they had hoped
2 for, right?

3 So again, the different navigational
4 theaters are going to bring different things to
5 the table on that as far as what's needed.

6 Current forecasts. Looking at that
7 image from the Great Lakes, currents are a big
8 issue, cross-currents and what the outflow is
9 from the locks. Those are big factors when
10 they're bringing those ships into the locks. And
11 then you have the observations that mirror those
12 on the other side. And we'll talk about each of
13 those independently.

14 So I think for some of you you may
15 have heard this story, but this is the story that
16 we have gotten from the Port of Long Beach here.
17 And ultimately, as they were -- and Captain
18 Strong will talk to you more about this shortly,
19 but as they were bringing the large crude
20 carriers in, they realized that one degree of
21 pitch ends up equating to --- for a 1,000-foot
22 long vessel, if you just do the basic math on

1 that, that's about a 10-foot change in draft as
2 that vessel oscillates through that vertical
3 motion. And you realize very quickly that given
4 a certain sea state that's going to induce that
5 sort of motion, the static draft doesn't begin to
6 nearly tell you the full equation on that.

7 So ultimately they've embarked on a
8 journey with a vendor named PROTIDE. And I'd
9 like to thank Karsten for changing his life plans
10 here to make it all the way across the ocean to
11 be with us today and to have meetings with us
12 earlier this week with the Port of Long Beach.

13 But basically PROTIDE is taking all of
14 that data and synthesizing that into a solution
15 that allows those vessels to come in and navigate
16 in a precision navigation fashion where they're
17 operating in very close proximity to whatever
18 their danger is.

19 And so, in this case what are we
20 talking about here for the Port of Long Beach?
21 Specifically what we're talking about water level
22 forecasts, wave forecasts. We've got the

1 bathymetry in there, and then we've also got wave
2 observations and water level observations. And
3 we'll see how each of those things work with each
4 other as I proceed on.

5 But this is the output that PROTIDE
6 puts out, and it's a report by vessel. The key
7 thing that we had before is as you looked at that
8 pinwheel diagram that I had, basically all those
9 data feeds are data feeds that NOAA provides and
10 that are in NOAA data tanks.

11 The one thing that we don't provide,
12 however, is something that is intrinsic to each
13 of the ships, and that's the ship's independent
14 motions. And part of the service that Karsten
15 and PROTIDE provide is that analysis of the ship
16 motion. And so, it couples that with all the
17 environmental observations and ultimately comes
18 up with a statistical probability of grounding on
19 that, and hopefully a statistically diminishingly
20 low probability of grounding.

21 And that's what each port ultimately
22 determines as far as what is an acceptable risk

1 that they're going to do. But in most cases it's
2 at the 0.018 level, I think, depending on where
3 it's at. I think there's this 0.017 percent of
4 grounding, which I think is deemed to be
5 statistically low.

6 And so, if we come into that, you can
7 see here's the 0.017 percent probability of
8 grounding in the under-keel clearances. So for
9 somebody as a surveyor who deals with
10 measurements and uncertainties in all of our
11 measurements, this is music to my ears to see
12 that.

13 That those uncertainties which we work
14 very hard in addition to just the soundings, but
15 to quantify those uncertainties with our
16 soundings and all of our scientific measurements
17 this is what you want, right? This is why we
18 have worked so hard over the last 10 years to
19 assign uncertainties with all of our
20 measurements, because when it comes into this, it
21 should make Karsten's job very easy as he pulls
22 that together to make a statistical value for our

1 mariners.

2 And so this is ultimately the money
3 graph for the port, is when can I bring that ship
4 in? And Karsten, speak out if I'm butchering
5 this too badly, but I think ultimately the white
6 space here is the time where that's at. And so,
7 you see time across the top. The vertical axes
8 are station marks along the channel coming in. I
9 believe 10 is offshore at the buoy and zero is at
10 Pier 121.

11 And so, ultimately this would be the
12 time at which it would be considered safe and you
13 would achieve that statistical probability for
14 bringing the ship in and not grounding. And so,
15 you can see that this whole area is where that
16 would be. And that's the tool that the port
17 would be using to say, okay, that's when we're
18 going to target our ship transits for that moment
19 in time.

20 As we talked about though, vessel
21 motion is a big issue, and this whole thing that
22 Karsten has put together and PROTIDE has designed

1 to do is a model. And so, those models have to
2 be validated. And so a lot of what we're working
3 on, both with Karsten and all the partners in
4 this, are validating those models. And I don't
5 want to steal too much of Julie's thunder,
6 because she'll be talking about that as well, but
7 this was some work that we did.

8 Just about two weeks ago, we sent one
9 of our survey technicians out with two GPS
10 receivers and we put a dual-frequency GPS
11 receiver on the bow of the ATC Legend just before
12 it left Valdez on its way here to Long Beach and
13 we put a GPS receiver on the stern.

14 So we had two measurements. And
15 ultimately this is the result of that. And I was
16 certainly surprised at it. Captain McCoughey,
17 who had been the captain on that ship, said, oh,
18 no, no, it definitely moves that much.

19 But if you look at, it you can see
20 here it wasn't all this much, but in some cases
21 that vessel was moving up and down peak to trough
22 by four meters. That's meters, not feet.

1 Meters.

2 So there was concern that -- certainly
3 hypothesis that, well, geez, that can't move that
4 much. And even the crew on the ship said, oh,
5 no, the weather moves around us, the ship doesn't
6 experience weather, which in hindsight is kind of
7 funny. But certainly the measurements that we
8 took bore that out. So it is a critical
9 measurement that needs to be had on that.

10 The other value that is critical to
11 this obviously, what makes the ship move up and
12 down are the waves. And so, National Weather
13 Service at Oxnard, the local forecast office, has
14 put together a model that they released just a
15 month or so ago, and that will be providing
16 valuable input to the PROTIDE model so that they
17 can do that. And so, those forecasts will be
18 helping to guide those calculations.

19 But the model is really just a quaint
20 set of calculations if it's not correct, right?
21 So the validation of that model is what's
22 critical. And this is the CDIP buoy. I don't

1 know if it's the exact CDIP buoy, but it's a
2 picture of a CDIP buoy getting deployed.

3 And so, this is the thing that
4 provides the validation for that to see is that
5 model really correct and is it providing that
6 data with a statistical certainty that we need to
7 bring a thousand-foot ship loaded with over a
8 million gallons of crude into a port? So that's
9 the other critical thing is making sure that
10 those models are working correctly.

11 So there's a very nice partnership
12 here I think between NOAA and academia and the
13 private industry to work together to solve that
14 problem, and certainly this is a shining example
15 of that in my eyes.

16 Water levels is the other thing that
17 I think you can't get around. And so, this was
18 from the PROTIDE report that came out for Long
19 Beach, and it just shows that 40 percent of the
20 water levels here in Long Beach are greater than
21 one meter. So if you don't account for that,
22 you're missing that window of opportunity to

1 actually load according to the tide.

2 And so, that's a valuable asset if
3 we're really trying to pinch out inches of draft
4 out of each transit of a vessel, because as we
5 know, every inch of draft has absolute financial
6 implications to the port and the products that
7 they're able to bring in. So I think if we talk
8 about economic resiliency in the ports, this
9 certainly is an enabler for that economic
10 vitality and resilience.

11 When you start talking about water
12 levels though, observations are not good enough,
13 because observations are telling you what's
14 happening right now. So you really need the
15 models to tell you what's going to be happening
16 in the future based on current observations and
17 based on all the other driving factors.

18 So this is a graph that Peter Stone
19 gave me for the Port of Baltimore. And you can
20 see the blue line is the astronomical
21 observations -- or I'm sorry, the astronomical
22 predictions. But you can see that before we had

1 almost a foot higher at one point based on the
2 storm that moved through. This was February of
3 this year in Baltimore. And then we had a
4 departure where the water levels actually got
5 almost three below what those predictions were
6 there in the Port of Baltimore.

7 So if you were just purely operating
8 on the predictive water levels, you would have
9 been way off in that arena. So having those
10 predictions and knowing that based on all the
11 driving conditions, particularly weather and wind
12 here in Upper Chesapeake, you would have only had
13 part of the equation.

14 Weather is also a big one in being
15 able to more effectively get our weather out
16 there to the mariners so that you can actually
17 overlay these things in your ECDIS system on
18 board or the computer system, the port management
19 system back on the beach. You can start
20 overlaying all of this data in a GIS-type fashion
21 so that you can make better, well-informed
22 decisions.

1 So getting our NOAA data in a format
2 that's easily ingestible in a machine-to-machine
3 format is really where this project seeks to take
4 us.

5 So NOAA's commitment for the Port of
6 Long Beach specifically is to create the 500-
7 meter resolution Nearshore Wave Prediction
8 System. That's currently out and in validation
9 right now. We really need a year to get a full
10 cycle, a full weather cycle for that -- to
11 validate that. And so, that's currently
12 underway.

13 We're going to operationalize a high-
14 resolution bathymetric database for the surveys
15 that were acquired by Fairweather here and keep
16 those running for the next five years. And so,
17 we've already -- as soon as we had gotten that,
18 we had a winter storm here. The Corps of
19 Engineers went out and resurveyed it and now
20 we've got new data to add to that. And so,
21 ultimately every time a new survey occurs,
22 whether it's from the port or from the Corps of

1 Engineers, we'd like to be able to add that into
2 that database, create new products and provide
3 them back out.

4 We've provided prototype high-
5 resolution bathymetry -- and I'll show you a
6 couple of examples of that here in just a second,
7 and the visualization tool to hopefully show how
8 this data, when it's properly enabled, can help
9 the mariner and shoreside support make those
10 decisions that they need to make.

11 So these are a 102, plus or minus,
12 grids that we've created. So each one of these
13 cells is a small ENC cell. So for anybody who's
14 unfamiliar with the whole ENC data format, they
15 try and keep you to a five megabyte limit. So
16 we've had to make these high-resolution cells
17 fairly small to keep them under that five
18 megabyte limit because we've got a fairly high-
19 density set of soundings in there along with a
20 high-density set of contours.

21 So anyways, we've made these and they
22 literally were rolling off the presses at the end

1 of last week just for this week's events. And so
2 we plan to provide those to the port here this
3 week, so that they can begin to use those and put
4 them in their portable pilot units.

5 This is a close-up view of just one of
6 those. This was during our test and evaluation
7 of that. You may not be able to tell, but the
8 green one on the left-hand side is a 20-meter
9 resolution sounding set. So each one of those --
10 if you look at each one of those little dots,
11 that's a sounding and those soundings, if you
12 were to measure around, the next closest one is
13 going to be 20 meters away. That was considered
14 to be a little too close, so we went back and put
15 them at 25 meters.

16 So this is ultimately the density of
17 the product that you're seeing there is a 25-
18 meter sounding spacing and half-meter contour
19 interval. And so, that's what is in each of
20 these overlays, along with the updated -- the new
21 ENC that will be released as well.

22 So let me just tempt the fates here on

1 that and see if I can actually do this
2 demonstration here. So this is a prototype that
3 we put together in the Coast Survey Development
4 Lab.

5 And ultimately the issue that we've
6 seen as we've traveled around and talked with
7 mariners is that we say, well, if you apply tides
8 and you have high-resolution bathymetry, you can
9 cut contours wherever you want that tell you if
10 you've got a 40-foot or a 60-foot draft ship,
11 where you can go. And we basically get a blank
12 look back, because I don't think they understand
13 what high resolution really means. So we're not
14 talking about 25-meter density soundings. We're
15 talking about half-meter resolution soundings.
16 So one sounding on the sea floor every half-meter
17 or every one meter.

18 So ultimately what we have here ---
19 this is one sounding every two meters, so a two-
20 meter resolution grid. And ultimately we've
21 applied tides to that.

22 So we're currently at the present time

1 -- so this taking real time water level values
2 from the NWLON Tide Station in Long Beach. And
3 if I bring it over here --- hopefully I still
4 have my Internet connection, I can also come in
5 and -- since we're in the U.S., I'll put it in
6 feet.

7 Can you type in 72 for me there? And
8 enter. See if it does that. Ah, I've lost my
9 Internet connection. Like I said, this is the
10 danger of a live presentation.

11 Okay. So ultimately I -- there we go.
12 So 72 feet, you can see red is bad, green is
13 good.

14 (Laughter.)

15 CAPT. BRENNAN: And so, you can see if
16 you were a 72-foot draft vessel coming in right
17 now, this is -- anywhere where it's red is where
18 you would not want to take that vessel. And you
19 can even see here in the channel that there are
20 some areas where you're going to be really close
21 to the seafloor.

22 So where the red -- the interface

1 between the red and the orange is pretty much
2 right at 72 feet, and the orange envelope is 72
3 feet to 73 feet, I believe. And then it goes in
4 I believe one-foot increments from there. So you
5 really have fairly low values below that.

6 And ultimately what you can do as well
7 is you can -- this tide slider here allows you to
8 go from the actual values, what you're receiving
9 right now, to the predicted values and go forward
10 in time.

11 So this is something that we did with
12 just a couple weeks of work, basically taking
13 data out of NOAA's data tanks and just
14 synthesizing it into a view like this, and it's
15 one that I hope will be valuable.

16 So in the future what we'd like to be
17 able to do is we're going to be adding in the
18 results of the wave models so that you can see
19 the wave model results right on top of that.
20 We'd like to be able to get AIS in there so that
21 you can actually see vessels and where they're at
22 in that.

1 You can also click on this and you
2 should be able to get the value of any sounding
3 at any point in the area of navigation, assuming
4 that your Internet is working. Clearly you don't
5 have -- well, you may or may not have Internet at
6 sea, that can be a challenge.

7 So this is ultimately the tool that
8 we're creating to share with mariners kind of our
9 idea on what we think the future looks like and
10 what's possible when you start synthesizing all
11 of these tools together into one thing.

12 So anyhow, let me take us back to the
13 presentation here. So the intended outcomes, as
14 I stated, was to gain experience maintaining the
15 gridded bathy database. So this is a new thing
16 for us. This is not something that we're
17 familiar with.

18 We've been dealing with gridded
19 bathymetry for 12 years or more now, so that's
20 not it. But I mean, managing this is in a rapid
21 fashion where we can add new data to it, update
22 the skin of the earth representation of the

1 seafloor and produce new products from that
2 rapidly is where we're at.

3 And so, we're hoping to learn
4 information from that and then be able to parlay
5 that to other ports using tools, like the one
6 that I just showed you, to educate mariners and
7 let them know what the realm of the possible even
8 is. As well as to provide other vendors who are
9 trying to enable their precision navigation tools
10 with NOAA data, and then to also encourage the
11 use of the S-100 standards that are currently out
12 there.

13 So for anybody who's not an IHO wonk,
14 that's the next greatest thing that's coming out
15 as far as data standards go. That should enable
16 a much richer set of data to be brought to bear
17 on the bridge of a ship. So that will include
18 gridded data, model data in a much better
19 rendering capability because it will have some
20 cartographic elements to that.

21 So what I wanted to leave you with
22 today is some questions. So thinking with the

1 end in mind, where is it that we might want to
2 go? And so, hopefully this will get you primed
3 for some of our breakout sessions. But where
4 might we go with high-resolution or high-accuracy
5 GPS, particularly in the vertical?

6 So if you have a ship that is able to
7 navigate and its GPSes that it's receiving is
8 accurate to, let's say better than 10 centimeters
9 in the vertical, what does that mean for you?

10 And particularly if we start providing data that
11 is relative -- all that gridded data -- currently
12 it's relative to mean low or low sea level, but
13 what if it were relative to the ellipsoid? So
14 now everybody -- instead of navigating on a tidal
15 datum, you're navigating on a geodetic datum. So
16 I mean, ultimately that's what we're talking
17 about if we're going to get to the level of
18 accuracy that I think that our ports are
19 demanding now, that's certainly -- to me that's
20 one of the most obvious things.

21 The other thing is we've got a lot of
22 data, as I showed, in our data tanks. So

1 ultimately how do we turn that data into
2 information, that information into knowledge, and
3 then ultimately with some experience and some use
4 of that knowledge that we can turn that into
5 wisdom for making better decisions again, and
6 that becomes a self-fulfilling loop there on how
7 we do that.

8 Ultimately how do we provide 24/7
9 support to these ports? Because they want to
10 operate 24/7. They want to bring ships in and
11 out of the harbor 24/7. So how do we press our
12 data into the service of helping that port meet
13 that need?

14 And then how do our products need to
15 change enable to support that? So will the same
16 old cartography and the same old products that we
17 create -- is that really where it's at and how do
18 we need to change those products to support that
19 navigational paradigm shift that's currently
20 underway? So that's the questions that hopefully
21 we'll have a chance to talk a little bit more
22 about later, but I think that's all I've got.

1 And with all my technical challenges, I've eaten
2 up my time and some of my colleagues', so I'll
3 let you change it from there.

4 CHAIR PERKINS: Thank you, Captain
5 Brennan.

6 (Applause.)

7 CHAIR PERKINS: So we'll do all three
8 presentations and then we'll pose our questions
9 to the Panel collectively at the end.

10 So our next presentation will be from
11 Ms. Julie Thomas. Julie is the program manager
12 and principal investigator at the Coastal Data
13 Information Program, CDIP. So Julie Thomas has
14 worked for over 38 years at the Scripps
15 Institution on Oceanography in La Jolla,
16 California. She's served as the program manager
17 and principal investigator of the CDIP Program
18 since 2001.

19 So, Julie, welcome, and we're glad to
20 have you here this morning.

21 MS. THOMAS: Thank you very much,
22 Scott, and thank you for inviting me to the HSRP.

1 And I'm also director of the Southern California
2 Ocean Observing System, so IOOS; I think most of
3 you are familiar with that program. And I'd just
4 like to say that this has just been a very
5 exciting project to work on with the Port of Long
6 Beach.

7 And let's see. I have control here.
8 Okay. Oh, where is it? Here we're going. Yes?
9 Where is the computer? Are you controlling?

10 Okay. So, I wasn't exactly sure, but
11 my first few slides are very broad. I wanted to
12 specifically talk about two programs that I am
13 involved with. And this one is the SCCOOS here,
14 which is one of the regions of IOOS. I'm sure
15 most of you know there's 11 different ocean
16 observing regions within the U.S., and we all
17 have our own observations. We are very heavy
18 advocates for sustained observations, and that's
19 really through SCCOOS what we try to maintain.

20 So we have HF Radar; we have
21 Blighters; we have shore stations where we
22 measure things; we have part of the leverage

1 programs are through the CDIP Wave Network. And
2 these are just a whole combination of different
3 observations that we have.

4 Okay. You've got it? Thank you.

5 So I just put the HF Radar up there
6 because this was such a state investment. In
7 case you don't know, in 2004 the State of
8 California put \$21 million into HF Radar within
9 the state. And that's primarily because of
10 course we have the potential for oil spills
11 offshore and people like Tom Cullen, in the back
12 who's with OSPR, are big advocates for these
13 systems, and these data do go right into the NOAA
14 NO model. We work very close with NOAA and OSPR
15 within the state.

16 And the other program I wanted to talk
17 about was mostly the Army Corps cooperative
18 agreement between the Army Corps of Engineers and
19 the State of California who funds this program
20 called CDIP, Coastal Data Information Program,
21 based at La Jolla Scripps. And this has been in
22 existence since 1975. I really want to commend

1 the Army Corps here because we have managed to
2 have sustained funding for this program since
3 1975. And we now have a network of 62 buoys
4 throughout the coastal U.S., including Alaska,
5 including the Caribbean and the South Pacific.

6 We don't do the field portion for all
7 of them because we have many partners -- for
8 instance, at University of Hawaii -- which take
9 care of the field operations, but all of the data
10 processing handling, the real time information --
11 these go from the buoy itself up to the satellite
12 Iridium to the DoD gateway because of the Army
13 Corps funding on Honolulu, back to Scripps, out
14 to National Buoy Data Center, all in about two-
15 and-a-half minutes. And they update every half
16 hour. We get that data to NDBC, then it is
17 wonderful because of course the partnership with
18 NOAA goes right out on AWIPS to the National
19 Weather Service office. It goes to CO-OPS to the
20 port system.

21 And a lot of people don't know that
22 actually it is the Army Corps that funds this

1 inter-network of buoys within our coastal U.S.
2 They get assigned a NOAA ID very quickly on at
3 NDBC. So this becomes part of the NOAA network,
4 but actually I like to just highlight the Army
5 Corps here because they are a big partner in
6 this.

7 So we're going to start drilling down
8 now to this area. And I wanted to just spend the
9 next few slides talking about kind of the
10 complexities for working within Southern
11 California. I get a lot of comments from people,
12 "Oh, the waves are benign in Southern California.
13 You don't have any problems. And what's the big
14 deal?" Et cetera. But when you look at the
15 islands offshore, when you look at some of this
16 charting that has been done through Coast Survey
17 and realize what type of bathymetry we have
18 between Catalina Island and the port, there's
19 canyons. There's a deepwater canyon there. And
20 there's an awful lot of wave refraction,
21 diffraction, a lot of processes, nearshore
22 processes here, wave processes that are going on.

1 So we put out -- the San Pedro buoy
2 actually went out -- do I have a pointer? Maybe?
3 Yes, right here. In the separation zone for the
4 northbound shipping lane is the San Pedro buoy.
5 And that one was actually deployed in year 2000,
6 once again funded by the Army Corps and the State
7 of California. And the directional spectrum on
8 the left shows predominantly where the waves are
9 coming from. So this is all the records, every
10 half hour since year 2000. That's what is
11 showing on the left here. So you can see that
12 most of them is this westerly storms or waves
13 that are coming in, but then we get the south and
14 a little bit that trickles in from these
15 different directions.

16 This is during a southern swell. This
17 was actually when the breakwater was breached,
18 and as you've heard, we lost some of the -- the
19 actual boulders were displaced at that time. And
20 that was kind of coming out of the south-
21 southeast there a little bit, but it really
22 depends on the swell as it approaches, like what

1 is going to happen to the entrance as these ships
2 are coming into the port.

3 Go ahead. So I wanted to just throw
4 this one out. These are just several shots to
5 give you the idea of this complexity for this
6 region. And I thought this one was interesting
7 for today because I believe it was July 24th,
8 2009 when the HSRP was meeting in Long Beach and
9 I was actually talking with Jacobsen Pilots at
10 the meeting and talking about the importance of
11 wave data. And during the break, someone came up
12 to me and said, "Oh, my gosh, Julie, did you
13 realize about this big storm coming in from the
14 south?" And I go, "Really?" Like I haven't even
15 heard it.

16 And I looked. Because I actually --
17 we send messages out to Jacobsen Pilots. We have
18 been doing this for quite a few years. Look at
19 what the models are saying, look at what the
20 waves are saying, and kind of give them a three-
21 day heads up if we see on our records that the
22 waves are going to be above a certain threshold

1 where they might be concerned about it bringing
2 in the ships. And I hadn't been getting the
3 messages. And I thought, oh, my gosh, I have to
4 call the lab, find out what's happening. We're
5 getting big storms. I have no message on my
6 iPhone, computer. And so I called and they said,
7 "No, actually it's working right."

8 And you can just go on to the next one
9 here because I think you can see it a bit better.
10 This is what's happening, is that these high-
11 resolution Datawell buoys, which thank you very
12 much, Rick, for showing picture of it -- they are
13 very, very accurate in measuring the wave
14 direction and wave heights. And actually, to
15 come into the port right there, it wasn't going
16 to get the full force of the storm because it was
17 blocked a little bit by San Clemente Island and
18 Catalina coming in.

19 And there was actually a surfer, a
20 bodysurfer that was killed up-coast at Redondo
21 Beach that day. Waves were big; they were
22 breaking at 20 foot at the entrance there. And

1 yet coming into the port, even though I believe
2 you had some harbor damage, they could keep the
3 traffic coming in because actually right there at
4 the port, it was not getting the larger part of
5 the wave.

6 And so, I'd just like to show this
7 because to me that really does show the
8 complexities. It's important economically to
9 keep the traffic going, right, to keep the
10 vessels coming in. You don't want to over-
11 predict; you don't want to call that there's big
12 waves and all of a sudden close all the traffic
13 to the port when, in reality, because of blocking
14 San Clemente and Catalina, maybe that channel can
15 stay open and vessels can keep coming in. So
16 this is to me kind of an example of why it's
17 important to have good wave data and good
18 forecasts, good models at this particular area.
19 We don't want to have them hit the bottom, but on
20 the other hand, you want to keep the traffic
21 going when you can.

22 Okay. So this is kind of my pull for

1 why we really need to validate models as we go
2 into this project with the Port of Long Beach and
3 under-keel clearance.

4 Go ahead. So I think you've probably
5 seen this, but they have had some close calls.
6 And, John, you can probably talk to this better
7 than I can, but from what I understand, there
8 have been instances where -- I think in this case
9 the vessel actually rolled and came very close to
10 the bottom -- closer than that 10 percent,
11 definitely. So we know that there are instances
12 where ships are in a vulnerable situation right
13 now.

14 So what we did so far with this is, as
15 Rick had said, is that -- this is -- oops. No.
16 Back. Back one. Oops. Just go back one.
17 Sorry. This is the San Pedro buoy; it's been
18 there since 2000. In September, we deployed San
19 Pedro south buoy; Captain Kip Louttit was on
20 board from the Marine Exchange. Thank you, Kip.
21 And we managed to put this buoy in here.

22 So now we have really good

1 observations, good measurements for both of those
2 slices of waves coming in from the west, from the
3 south, from the north coming up here. We can get
4 them. And as you've heard, the National Weather
5 Service is developing this ocean forecast system,
6 a high-resolution model for this area. In the
7 meantime, we're actually sending to Karsten --
8 thank you, Karsten, for coming -- to PROTIDE, the
9 CDIP model that we have run in house. We
10 actually have a model that was developed since
11 1985, a wave model that we've been using. And
12 those are examples of what you've been seeing.
13 That's actually our own CDIP model, and we're
14 actually feeding that to Karsten right now.

15 There's two data points. One here.
16 We call it our SP021; that's our spectral value,
17 and Spectral Value 020 at Location 20. So this
18 is the channel coming in here. And both of those
19 values are being fed into PROTIDE right now as a
20 temporary measure until the National Weather
21 Service is up and ready to go operational.

22 Okay. So I mentioned that we are

1 sending messages to Jacobsens right now. This is
2 an example. This is Wavewatch 3. For those of
3 you that know, that's the model, which has been
4 running out of NCEP for quite some time. And
5 like I said, this is a difficult area to actually
6 model. And they have never had the chance to
7 really validate or bring that model inshore. It
8 usually stops further off in deep water.

9 What we've done before in working with
10 NCEP is each one of our Datawell buoys -- so from
11 the map where you saw the 62 buoys -- NCEP has
12 actually put in that point at that latitude-
13 longitude of the buoy as a model point within
14 Wavewatch 3, so we can do a comparison of
15 Wavewatch 3 right at that location on all of our
16 buoys.

17 So for this particular one, when we
18 see this type of thing happening, the model is
19 predicting something, but then we see at least a
20 foot difference in what is going on. And we
21 actually do send this data -- this is what is an
22 example of what Jacobsen Pilots would get then.

1 And we just have that automated. We look for our
2 thresholds above a certain wave height and the
3 longer period waves. I think anything over 10 or
4 12 seconds is when they're interested.

5 Okay. So this is a website that we've
6 kind of thrown together just very much like Coast
7 Survey did, but it's not quite as sophisticated.
8 This is actually a display at the Marine
9 Exchange. I don't know if you saw it yesterday
10 or not, but there's a lot of stuff on here. This
11 is San Pedro buoy this side; this is San Pedro
12 south this side. This is the CDIP wave model.
13 What's happening, this model updates hourly. And
14 this I think is just really helpful; it shows the
15 spread of the direction of the wave and energy
16 that's coming in.

17 Go ahead. So this is really my last
18 slide. I just wanted to acknowledge that -- and
19 it's been mentioned before -- but this has been
20 really a nice partnership. Just looking around
21 the room with the end user, the industry
22 partners, the Marine Exchange. Tesoro is here,

1 PROTIDE, Jacobsen Pilots. I think that as really
2 working with federal agencies, both NOAA and the
3 Army Corps and the State of California, it's
4 really nice to see all of this partnership coming
5 together. And I think this is a good example of
6 that. So thank you very much.

7 (Applause.)

8 CHAIR PERKINS: Great. Thank you,
9 Julie.

10 The last speaker on this panel is
11 Captain John Strong, Vice-President of Jacobsen
12 Pilots. Since 1922, Jacobsen Pilots has been
13 keeping vessel traffic flowing and safety and
14 smoothly through the Port of Long Beach. In
15 addition, the company serves the U.S. Navy as
16 their contract pilots for the Naval Weapons
17 Station Seal Beach. Captain Strong became a
18 Jacobsen Pilot in 1982. He was appointed vice-
19 president in 1997. He is a graduate of the
20 California Maritime Academy. As chairman of the
21 Los Angeles/Long Beach Harbor Safety Committee,
22 he also serves on the Executive Steering

1 Committee for the Central California Area
2 Maritime Security Council, representing the wet
3 side of the table.

4 So, welcome.

5 CAPT. STRONG: Thank you. Well, let's
6 see, Rick did the first half of my presentation
7 and Julie did the second half --

8 (Laughter.)

9 CAPT. STRONG: -- so I'm just going to
10 stand up here. I'll give some sea stories as we
11 go.

12 (Laughter.)

13 CAPT. STRONG: You've seen this ship
14 a lot, Genmar Vision, the Stena Vision, same
15 ship. This is a great example of the size ships
16 that now can come in fully loaded into the Port
17 of Long Beach. The ship is 1,100 feet long, 230
18 feet wide and has a maximum draft of 63 feet. We
19 can actually bring ships in up to 65 feet now.
20 That's 312,000 dead weight tons of cargo that
21 this ship carries. This has been a slow
22 evolution over the years. As the dredging

1 continues, the ships get bigger. The terminals
2 are able to handle these ships. And this is the
3 challenge that's been going for us as pilots, as
4 to slowly evolve and do larger and larger ships.

5 The way it works or has worked up to
6 now -- now, I'm an old school guy. I'm kind of a
7 look out the window, gut feeling, does it feel
8 good or not, should I go? And over the years,
9 having piloted for 33 years, more and more tools
10 have become available to us. And up until --
11 well, even today that ship comes in, approaches
12 from sea, we have a weather event going on,
13 really the control we have over it now is the
14 pilot and master look at it, they kind of sense,
15 well, are we pitching one degree? I don't know.
16 What do you think? Are we pitching one degree?
17 How do you measure one degree of pitch?

18 And I became very concerned about this
19 when the whole responsibility of whether to
20 attempt a transit with the ships of this size
21 coming into the Port of Long Beach rested solely
22 on two guys out there talking amongst themselves

1 with very limited data input. I expressed my
2 concern at a Harbor Safety Committee meeting and
3 the Coast Guard's ears poked -- I remember
4 Captain Jenkins was here at the time. We had
5 just dredged, so we could take into 65 feet. We
6 were shooting for 69 feet actually, and that's
7 what we felt we could do at the time. And I
8 remember his ears perking up and said, you know
9 what, I think we'll just freeze this at 65 feet
10 for now until we can get a better handle on what
11 we're doing here and get some more information.

12 We can go to the next slide. Parallel
13 to this, we've had the rise in the size of the
14 just astronomical increase in size of container
15 ships. And that wasn't a big deal for us. We
16 never ever thought that air draft would be an
17 issue coming into the inner harbor. Then all of
18 a sudden they just kept building the ships bigger
19 and bigger. And again, the question that came to
20 the pilots is: How big a ship can you put in that
21 little hole back there in the inner harbor? And
22 again, it was one of those deals that we said,

1 "Well, I don't know, what do you think? Let's
2 try." Are we going to keep getting bigger and
3 bigger until we have an accident? And I said,
4 "We got to come up with some sort of guidelines
5 on how big is too big."

6 The air draft, the air gap on that
7 ship really started us thinking on the importance
8 of tides. Up to this point, before that ship --
9 that's the MSC Texas. Let's see, it came in
10 2004, I think it was. And up until that point
11 when we had an issue with air draft, we knew that
12 the bridge was 155 feet above the water at mean
13 high water, and as long as the ship had an air
14 draft -- if the ship even calculated the air
15 draft -- less than 155 feet, we could go. And
16 we're talking an inch less, two inches less,
17 whatever.

18 And I'll never forget one day I'm
19 driving into work -- and this was before these
20 8,000 TEUs started coming into the inner harbor -
21 - and I was coming in to check on the boys on the
22 weekend, and I'm listening to the radio and it

1 says, oh, because -- there was an El Niño event
2 in the 1990s sometime -- and said, "Geez, isn't
3 that weird?" -- because we'd been going off
4 predicted tides. The LA Tide Station has a long
5 history of being very precise on the tides in
6 this port.

7 And the radio announcer says, "Well,
8 geez, we got a two-foot higher than expected tide
9 today because of El Niño." And we had a ship
10 coming in. I'm coming down Ocean Boulevard. I
11 can see the ship approaching the bridge and I go,
12 "Oh, God." And I knew we were only within a
13 couple feet of clearance at that point. I kept
14 driving; I drove right over that bridge and
15 stopped on the other side and got out of my car
16 and watched that ship go underneath the bridge.
17 I thought if it hits, I might as well be the
18 witness to it because I'm going to be in talking
19 to the Coast Guard about it.

20 (Laughter.)

21 CAPT. STRONG: Luckily it cleared. At
22 that point that's when we said, "Okay, we got to

1 have a safety limit here for the ships coming in
2 underneath here." We went to the port. We said,
3 "We need to have some sort of way of getting some
4 real time information and not just work off the
5 predicted data." We got a direct link to the LA
6 Tide Station at the point. We started the
7 discussions about, "Oh, is there technology out
8 there that can actually measure the height from
9 the bridge down to the water?"

10 We started finding out that there was.
11 There's different types. There was radars; there
12 was lasers; there was all this stuff. And it
13 like started that discussion, started pulling
14 through the port. We were reaching out to NOAA
15 and anybody we could find to find out what was
16 out there that could help us. And so, we were
17 doing the shotgun approach on let's wait until a
18 close call and then go out and find out what's
19 out there that can help us prevent an accident
20 from happening. That process started the
21 discussion amongst us as a pilot group working
22 with the port on getting a little more -- taking

1 more advantage of the available data out there
2 and what people are assembling it for.

3 We can go to the next slide. Going
4 back to the container ships again, we started at
5 that stage. In 1996 we went out and contracted
6 with a company -- at the time it was named AIRINC
7 -- that did some of the navigational protocols
8 for the airline industry. They were formed
9 during World War II to standardize the navigation
10 procedures and everything for the airlines. We
11 hired a consultant to go out and see what was on
12 there, what off-the-shelf navigational aids or
13 instruments were out there that we could maybe
14 develop our own.

15 We found AIRINC. We started working
16 with them, and we started a discussion. We're a
17 private company with another private company in
18 saying, "This is our problem. How do we solve
19 it?" They would go out and find out what the
20 technology was out there and started developing
21 our own carry-aboard pilot unit. It's gotten
22 down to a little bit smaller, but it was pretty

1 clanky at first. All hard-wired together. We've
2 gone wireless; we've got shoreside stations and
3 sensors and all that kind of stuff. But it was
4 one company hiring one consultant and working on
5 our own trying to figure out what was out there.

6 Then working with the ports, we've
7 been educating ourselves on, well, the ports are
8 taking soundings, but how often are they taking
9 soundings? NOAA gets soundings. They upgrade
10 their charts, but how accurate are they? We had
11 no concept of the detail that was going in, so we
12 were floundering around out there.

13 So that evolved into we got the air
14 gap sensor on the bridge; it helps us with the
15 real time distance on the bridge to the water.
16 And we also have that horizontal factor that
17 Captain Brennan was talking about, where we're
18 taking wider and wider ships back in the channel.
19 Well, you have captains coming in. They look at
20 the channel. The channel is this wide. Look at
21 all that blue water. Well, the channel is shaped
22 like a V. So the deeper the ship is, the

1 narrower the channel is, right? And we have
2 ships coming back in there that are 1,150 feet
3 long, so up-path you have to stay pretty much in
4 the axis of the channel or your stern will hit
5 one side and your bow will hit the other. And we
6 have to be able to see how much channel do we
7 have underneath the water that you can't see?

8 So we started with the port taking
9 soundings and getting sounding points and putting
10 them into our own navigation units that we could
11 draw up pretty much like -- I mean, that model
12 you showed, that's our dream model. You got
13 everything. But we were limited that -- that
14 takes a lot of data and the computer to process
15 that, keeping a smooth picture of the ship moving
16 through there, we were limited to doing just
17 sections at a time as we were going through very
18 clunky, working up through that technology.

19 But that allowed us -- when the port
20 came to us and said, "How big a ship can you take
21 down this narrow channel?" And we went through
22 the process, that CNN test, like, "So, Captain

1 Strong, what were you thinking when you ran that
2 ship aground in the back channel, you know?"

3 (Laughter.)

4 CAPT. STRONG: Going through that and
5 saying at least we surveyed the channel and made
6 sure there's no -- we did find a bunch of old
7 boulders and concrete blocks and stuff that were
8 left over from the old pontoon bridge; even the
9 Spruce Goose used to be moored there. There was
10 some debris from that. Surveyed all that. Got
11 the latest soundings. Put it into our PilotMate.
12 Had a meeting with the Coast Guard. Brought them
13 in and said, "We'll try it."

14 And so we did. And we've since --
15 that was 140-foot beam back then. And just last
16 week I took a ship -- it was a one-time deal --
17 kind of went through the same process of 158 feet
18 beam. So utilizing the inner harbor so much
19 greater now than we used to, due to the
20 technology that's available to us.

21 Next slide. Now getting back to the
22 VLCCs and the ULCCs, like I started, this is -- I

1 thought I better get a BP ship or something in
2 here, Rob, just one of your customers. This is
3 an 1,100-foot ship, 190-foot beam; it's got a
4 maximum shaft of 73.9 feet -- that's 306,000 tons
5 dead weight. Well, this is a ship that wants to
6 come into Long Beach Berth 121, which is the
7 deepest tanker terminal in the lower 48 states.
8 And we're shooting -- our goal is to go to 69
9 feet, because that goes back historically on how
10 these things work. When Arco had 121 channel --
11 let's see.

12 Next slide. I'm kind of bouncing
13 around; we can go to the next slide. When Arco
14 had that terminal, their deepest ships at that
15 time were 69 feet deep. And they came to the
16 port and said, "We want to bring in our ships
17 fully loaded. How deep a channel do we need?"
18 They come to the pilot. So, how deep a channel
19 do you need to bring in a 69-foot draft ship?
20 And, well, 10 percent sounds pretty good. Let's
21 say 10 percent under-keel clearance and let's go
22 from there. And so, 69 feet or 7 feet. Say, oh,

1 that's 76 feet. That's how we came up with 76
2 feet on that channel. I mean, just a wild-ass
3 guess by the pilots on 10 percent under-keel
4 clearance. The port said yes. They started
5 dredging; we dredged it down to 76 feet.

6 In the meantime, Exxon-Valdez
7 happened. The tankers went from single-hull to
8 double-hull. The same size tanker all of a
9 sudden became a lot deeper, and now we still
10 can't get a fully loaded ship in there with a 10
11 percent under-keel clearance.

12 But once we finally got all the
13 dredging done and said, "Okay, our customers, the
14 oil companies are ready; let's bring it in at 69
15 feet." And it's all of a sudden we're saying,
16 "Oh, my God." We had to go back. Our tug escort
17 regulations, our matrix on how heavy a ship we
18 could bring in, are all based on displacement
19 tonnage for how much tug power we need -- didn't
20 even go up that high. So we had to go into the
21 process with the state and refigure the matrix on
22 escort tug strength and all that. And we got

1 that done. And that's when I had the
2 conversation thinking I know we said we could go
3 in 69 feet, but I'm older and wiser now, and I'm
4 not feeling so good about that and worried about
5 the movements of the ships and those kind of
6 things.

7 So here we are now. We can go to the
8 next slide. Everyone's seen that; that was the
9 reason.

10 We can go to the next one. Now we
11 need to figure out: How deep can we go into Long
12 Beach 121 and under what conditions? Like I
13 said, the model now is the pilot and the master
14 get out there, they look at the conditions and
15 they eyeball it and they think, "Well, I feel
16 good about it. Let's go. I don't feel good
17 about it." It only takes one person to say, "No,
18 we're not going to go. We're going to go out an
19 anchor outside." Of course, when a terminal is
20 waiting for a million gallons of oil to come to
21 it and the ship says, "Ah, never mind; we'll wait
22 for the weather to get better," that's a huge

1 expenses. And I've learned from long experience
2 that if you're going to disappoint somebody,
3 disappoint them as far in advance as you can.
4 Give them time to get used to it.

5 But how can we make a prediction on
6 whether we can go or no-go in advance and take it
7 -- don't put that responsibility on two guys
8 sitting out in the middle of the ocean trying to
9 eyeball how a ship's moving around and they're
10 five miles offshore coming in. Who knows what
11 it's going to be like when we get to the gate?

12 Julie mentioned about a ship rolling
13 and touching. That was the Arco Alaska, and that
14 was back in like '85 or something, 1985. That
15 was before the channel was dredged, where it was
16 a 59-foot channel. And that ship rolled right at
17 the breakwater entrance and it was during a -- it
18 was west swell coming in. And nobody expected to
19 roll. We all at the time -- we thought, well,
20 that's a double-bottom ship. There's a stability
21 thing in there. Maybe it rolled. It touched.
22 Didn't breach the hull or anything. But it was

1 one of those things that made everybody stand up
2 and take notice. So we got to get beyond the
3 eyeball judgment of the pilot and the master.
4 And this is a process that we're working on now.

5 Real quick, on the PROTIDE thing,
6 Karsten, you got to thank me for bringing you
7 over here, because I've been worried about these
8 deep-draft tankers. In Rotterdam, they have a
9 76-foot deep channel, very similar to Long Beach.
10 They board 15 miles out. These ships come in at
11 72, 73, 74-foot of draft. And I took a trip over
12 to Rotterdam, rode with the pilots, looked at
13 their pilot system and talked about -- I remember
14 talking to a pilot and saying, "God, how do you
15 guys figure out when you're going to go or not?"
16 And he pulled out this sheet of paper. "We got
17 this. They tell us." And I said, "Well, what
18 happens if it's wrong?" And he says, "Well, no,
19 it's not wrong. The port tells us to go and we
20 go. That takes all the responsibility off the
21 pilot."

22 Well, that's how we got introduced to

1 PROTIDE and started that conversation with him
2 and said, "Well, what do we need to develop a
3 system like this?" And all this stuff, NOAA,
4 Julie and everybody's been working in the
5 background, Army Corps of Engineers. Well, we're
6 just a little company out here on the West Coast
7 doing it by ourselves and not realizing what
8 assets are out there. And that was the beautiful
9 thing about -- NOAA jumped all over this with
10 this Harbor Safety Committee. The NOAA
11 representative -- at the time, Gerry Wheaton --
12 now Jeff Ferguson is on there, has been putting
13 us in touch with the right people to get the
14 right things down.

15 We can go to the next slide. But as
16 an example of the gaps here, this -- before I did
17 this, just last week I went on our PilotMate
18 system. I said I'm going to -- because I knew we
19 supposedly had the data of all the soundings
20 outside the breakwater. They had given them to
21 our tech guy that does our PilotMate system. And
22 I set up -- this is a 69-foot -- I put in a 69-

1 foot draft of the ship, with a 10 percent under-
2 keel clearance -- or a 65-foot with a 10 percent
3 under-keel clearance -- to show me where the
4 shallow areas were, and this is what came up.

5 We have missed all that data to the
6 east. And that's not NOAA's fault; that's our
7 fault. Somehow we didn't know the right
8 questions to ask, or I didn't communicate to my
9 tech guy the questions to ask, because that
10 communication chain had kind of broken down. And
11 it's groups like this and these kind of get
12 together that help operation guys like me that
13 don't really understand the science. I only know
14 I want the end result and know the end result I
15 need, but to help fill in those blanks. And just
16 that alone has just been huge for you guys coming
17 out here this time.

18 Okay. We can go to the next one.
19 Yeah, PROTIDE, blah, blah, blah.

20 (Laughter.)

21 CAPT. STRONG: Going to be great. But
22 the one thing with PROTIDE is that, again,

1 learning as an operations guy, it sounds easy. I
2 mean, I had my computer guy tell me, "With enough
3 time and money we can do anything." But with
4 PROTIDE we need the data to come in. And getting
5 that data is really tough, especially when you're
6 talking as a private company or something going
7 out and trying to do it yourself. And we've been
8 introduced to Julie; she's been helping us with
9 the wave models, and then with NOAA and all the
10 support that we're getting from this group here
11 and with industry.

12 See, it's all economically-driven,
13 too. Because without the Army Corps -- we first
14 came and four or five of us sat down to talk
15 about this and the first question is, "Okay,
16 well, where are we going to get the money?" We
17 got the state to come up just for the feasibility
18 study to see if it was even possible. So, okay,
19 "Well who's going to chip in to fly Karsten out
20 here to talk to us?" But we had the state chip
21 in some, the ports chipped in some, and the oil
22 companies chipped in a lot. And Rob went out and

1 knocked on a lot of doors and got a lot of
2 funding to get this thing off the ground. And
3 then with that and getting the federal side of it
4 in has just -- this thing has just taken off.
5 It's been huge.

6 Next slide. But I'll tell you what,
7 this is the next challenge. And that's a great
8 picture. I saw Julie used it, too. But this is
9 like a 14,000 TEU going into Pier J South, which
10 is right north of the opening to the Long Beach
11 breakwater. That ship right there has only three
12 feet of under-keel clearance; that's all we're
13 requiring now.

14 And this is not necessarily a long
15 period swell concern of mine; it's a southern
16 storm concern of mine, because when you turn
17 around, that ship's 158 feet wide, it's not going
18 to take much roll to touch the bottom. And it
19 hasn't happened yet, but when it does -- or if it
20 does -- it's going to be a big deal, because when
21 the Panama Canal opens -- this is just a
22 prediction -- all these ports on the East Coast

1 are trying to get more water to get these ships
2 in there, that pitch and roll thing for them,
3 it's going to be huge for all the ports, I think,
4 on the East Coast with the big container ships
5 coming in.

6 And you know what, these ships, when
7 they come in, they're very tender because they
8 don't want to be stiff. They need to be very
9 tender so that they don't flip the containers
10 off. So they have as small a GM as possible, and
11 they roll real slow and real long. So you heard
12 it here first. And that's the next stage.

13 We can go to the next slide. This is
14 the hugest thing of the deal is the partnership,
15 and we all talked about it. And inside the
16 breakwater stuff, it just gets more and more
17 complex. And I understand inside the breakwater,
18 making predictions is a Herculean task. And
19 we've already started the initial discussions
20 with it. It's going to be very expensive and to
21 get the data, but I hope after we prove the
22 PROTIDE system for us outside the breakwater and

1 we concentrate on the tanker companies helping
2 fund it and get it off the ground -- my goal as
3 the next stage is we start pulling in the
4 container ship companies and we start working
5 inside the breakwater and take care of those guys
6 in there. That's all I have. Thanks.

7 (Applause.)

8 CHAIR PERKINS: Thank you, Captain
9 Strong.

10 Who would like to go first for
11 questions for the panelists? Dr. Miller?

12 MEMBER MILLER: Joyce Miller. The
13 PORTS system, we've heard it many other places,
14 is very differently funded in different harbors
15 around the country. What are the plans for this
16 system in terms of sustainable funding for the
17 Port of Long Beach, whoever?

18 CAPT. STRONG: From a pilot's
19 perspective this is all customer-driven, because
20 we don't get any funding down here in the Port of
21 LA and Long Beach for our port system. And like
22 I think San Francisco gets some sort of funding

1 up there from the state. But the pilot's saying,
2 "If you want us to take this size of ship to this
3 berth, this is the information we need." PORTS
4 provides that information. So the Port of Long
5 Beach is more than happy to help fund the PORT
6 System. And above and beyond that, in the future
7 as they build things, they build them to the
8 PORTS standard, their surveying equipment and all
9 that kind of stuff so they can help, I believe,
10 they can help get the data to the Government as
11 well for sure.

12 MEMBER MILLER: So this new system
13 will be funded probably in the same manner that
14 the --

15 CAPT. STRONG: Well, it's a
16 partnership. We're going to go to the oil
17 companies and whatever. Or everything stops and
18 the big ships don't come in.

19 CHAIR PERKINS: Dr. Kudrna?

20 MEMBER KUDRNA: We toured the port
21 yesterday and I guess those from other parts of
22 the country, we're surprised that there's still

1 ships under anchor backlogged from the strike.
2 Obviously there are economic consequences to
3 that. Is that purely a labor issue or could some
4 technology improve the ability to clear that
5 system up?

6 CAPT. STRONG: I think it's a labor
7 issue. I don't think there's anything technology
8 could do. I think one thing though that is
9 surprising to people is you keep seeing the labor
10 issues have been resolved evidently, but there's
11 still a lot of backlog anchored out there. A lot
12 of those -- and Kip can probably address it --
13 are new arrivals, because they've been drifting
14 out at sea in the -- out of the air quality zone
15 so they can burn the dirtier fuel. And as their
16 times come up, then they come into anchor. So
17 they've been out there for a long time, a lot of
18 them.

19 CHAIR PERKINS: Yes, I'll go one.
20 Captain Brennan, would the one-meter grid
21 density, would the new high-resolution data set
22 -- and not being familiar with the movement, the

1 shoaling and the movement of the bottom in this
2 region -- at what frequency are you going to have
3 to go out and resurvey this area to have an
4 accurate data set that will support the use of
5 this new precision PROTIDE and approach?

6 CAPT. BRENNAN: Well, I think that our
7 hope is that at least beginning to monitor it at
8 that level is what it's going to take. And so,
9 certainly for the channel that's not within
10 NOAA's jurisdiction; that's a Corps of Engineers
11 -- a federally-maintained channel -- so they
12 would be doing that. But I think as we start to
13 navigate more closely to the bottom, I think that
14 it's going to bring that certainly into sharper
15 focus, or it should drive that into sharper focus
16 as to what is that resurvey frequency? So that's
17 a question that I don't think that we know right
18 now.

19 I mean, to the benefit of the Long
20 Beach and LA Ports, I think geologically there's
21 not a lot of sedimentation and dredging, at least
22 as I've been told, is not routinely needed like

1 it would be in the Gulf Coast or on some of our
2 East Coast ports, but I think that, you know,
3 that may change as things get tighter. So I'd
4 have to let Captain Strong answer some of those
5 questions.

6 CAPT. STRONG: Are we talking about
7 how accurate the soundings are?

8 CHAIR PERKINS: Not about how accurate
9 they are, but how often -- if it's the Army
10 Corps' burden to provide a timely and accurate
11 data set at a one-meter resolution in order for
12 this solution of precise navigation to work, is
13 that a feasible expectation? And I don't know if
14 we have anybody from the Army Corps here today,
15 that I guess sitting here I'm like, "How do you
16 keep an accurate enough data set temporally
17 current enough for this system to be reliable and
18 provide safe, precise navigation?"

19 And maybe this geography on the ocean
20 bottom doesn't move and sedimentation isn't the
21 concern, but looking at the -- it's compelling,
22 right, very compelling and that's citing

1 application of technology to get the ships in and
2 out at a tighter frequency. But what are we
3 going to do with this system in Charleston, where
4 we just met, where the sedimentation and the
5 shoaling -- are we going to have to resurvey
6 every day? That's the nature of the question I'm
7 trying to ask.

8 CAPT. STRONG: One of the phenomenon
9 that's happened with the advanced technology of
10 taking bottom surveys is you see every nook and
11 cranny. And every time I take a ship into the
12 dock, I'm going to change the contour of the
13 bottom just by virtue of popping 100,000
14 horsepower engine dead slow ahead for five
15 seconds. I'm going to take this pile of mud here
16 and I'm going to put it over there, and you're
17 going to be able to see it. And in the old days,
18 I mean -- I think in Houston they still do it --
19 moving a little bit of mud around is not a big
20 deal with a ship. If it's not hard, it's soft.

21 So when you start getting too detailed
22 -- I almost wish we could make the soundings more

1 coarse, plus or minus a foot or something,
2 because the way contracts and stuff are made with
3 terminals, with the port on how deep a ship, am I
4 allowed to get into your berth, and you have 18
5 inches under-keel clearance, well, if you have a
6 six-inch swing, all of a sudden you can't get
7 that ship in there anymore and it's a big hoopla
8 going on. And I think there's -- the threat is
9 not as big as the consequences of not knowing
10 that. You know, the ignorance is bliss thing?

11 But like you said, yes, if you want to
12 be that precise, you would have to survey every
13 day.

14 CHAIR PERKINS: To those in the survey
15 business, that's great news.

16 (Laughter.)

17 Gary?

18 MEMBER JEFFRESS: Well, it seems to me
19 that the pilots -- you're going out in vessels
20 every day. Why not put hydrographic
21 instrumentation on the pilot boats so that you
22 can actually change it, get the data and see the

1 change on a daily basis?

2 I'm going to ask this to Andy. Andy,
3 is there technology to do that?

4 MEMBER ARMSTRONG: I may get in
5 trouble here.

6 (Laughter.)

7 MEMBER ARMSTRONG: Certainly it's not
8 a technology issue, but it's a process issue and
9 an expertise issue and a personnel issue in terms
10 of installing and maintaining the equipment,
11 processing the data, keeping track of all the
12 corrections, getting that through the system. So
13 I say the technology exists, but the process is a
14 challenge for something like that.

15 CHAIR PERKINS: Carol?

16 MEMBER LOCKHART: Yes, I actually was
17 going to ask this the same question as you,
18 Scott, so I'm glad you asked it. I have a slight
19 follow-up to that, and that is if you get these
20 updated data sets, whether it be from the Army
21 Corps of Engineers, whether it be from yourselves
22 -- you talked about rapidly updating the database

1 and I'm wondering if you have a goal in mind for
2 what's meant by "rapidly?"

3 I know certainly when they do this at
4 Rotterdam, they go out and they survey very
5 regularly and they're updating I think almost
6 overnight those ENC's. Is that the kind of goal
7 you have in mind for precision navigation? And I
8 guess I'm asking in the context not only of Long
9 Beach, but we've been asked to consider other
10 ports that this might be of interest to for the
11 U.S. That's one of the questions we've been
12 asked, so I'm wondering if you could comment on
13 that?

14 CAPT. BRENNAN: I'm looking at the
15 admiral here because talking about dangerous
16 waters, certainly overnight would be great. I
17 mean, I think what the Port of Rotterdam does is
18 absolutely the gold standard, but they control
19 everything, and they're delightfully small.
20 Right? So I think the challenges there are very
21 well contained. They have dominion over the data
22 and the products that they create and everything.

1 So, but it does show the art of the possible
2 there. And so that's certainly the goal.

3 I was intentionally vague as far as
4 doing it rapidly and what that meant, but I mean
5 I think we would like to say -- I mean, if we
6 could get that data and prioritize it and turn it
7 around, at least initially I think in two weeks,
8 we think that that's probably doable right now, I
9 mean, assuming that that was a priority and it
10 would supplant other things in that.

11 But we don't know right now, and
12 that's the point. And that's the whole reason
13 why we're doing that is we don't know what we
14 don't know. And so we need to begin to
15 understand, okay, well, what does that take? How
16 quickly can it drop in? And so there's a whole
17 host of issues. There's data format issues. Is
18 the Army Corps actually logging and calculating
19 their uncertainty? And if they're not, well,
20 then what do you do? I mean, you know what that
21 means to your calculation of your gridded data.
22 And so if there's no uncertainty to it, well, how

1 do you prioritize it with everything else that's
2 in your database?

3 So those are the questions that we're
4 hoping to understand better as we go through this
5 process, is what does that mean? Technologically
6 it sounds easy enough, but in practice it's an
7 entirely different thing.

8 CHAIR PERKINS: Captain Rasselto?

9 MEMBER RASSELLO: Hi, my name is
10 Captain Rasselto. I'm from Carnival Cruise Line.
11 I have a question regarding the assessing report
12 in regards of the under-keel clearance. You feel
13 comfortable with 10 percent under the keel with
14 the 65-foot deep draft vessel, right?

15 CAPT. STRONG: No. No.

16 (Laughter.)

17 MEMBER RASSELLO: Well, my question is
18 we assess our under-keel safety clearance about
19 20 percent just to be say conservative due to the
20 height of our vessel to the wind effect to the
21 side list. So how this would be communicated
22 with the end user, let's say the shipping

1 industry, if a port is doable for certain draft?
2 In the planning stage, I mean. When I try to
3 plan my itinerary, they ask me can this ship go
4 to Long Beach? So I have to have a good
5 assessment based on the data you provide and
6 decide if 10 or 15 or 17 or 20 percent would be
7 enough. So I noticed that you use 10 percent.
8 Is this base on static draft or dynamic draft?

9 CAPT. STRONG: Well, that was on
10 static draft, but we're talking -- this is the
11 olden days where we didn't know anything. We
12 were guessing that that would be a good figure to
13 start from. There were some studies out there
14 that the ships would not experience conditions
15 that would allow them to pitch or roll, that
16 would exceed 10 percent. But that's when we
17 started getting more and more information. And
18 at that time the information that we got was that
19 it was very unlikely that we would get long
20 period swells in excess of 15 seconds. And it
21 was the 18-second swell that was probably going
22 to cause the problems. So then we think

1 statistically it's not an issue. But as we got
2 more and more data we started finding out that we
3 were getting those swells.

4 So, and there's also -- captain,
5 there's a big difference between -- when you talk
6 about 20 percent under-keel clearance, I guess
7 you're talking about the approach to the harbor,
8 because they certainly wouldn't get that
9 alongside the berth. But depending on where the
10 berth is and what you're going to experience
11 between the breakwater and the berth -- that's
12 like that picture I showed you of the container
13 ship. This is a gap in our process that needs to
14 be addressed, I think.

15 MEMBER RASSELLO: Yes.

16 CAPT. STRONG: And that's a tough one.

17 MEMBER RASSELLO: Yes, I think it will
18 be good if the NOAA present this as a criteria
19 when we buy a chart, right? And then the chart
20 says, okay, this is the minimum under-keel
21 clearance based on the data we have for this
22 port. So the user will already know that the

1 study has been done according the data provided
2 and not trying to guess himself and then decide
3 with the pilot when the pilot board if they can
4 go or not go, having already a baseline study of
5 -- write it down. Let's say, okay, this is the
6 minimum to accept a ship in this port.

7 CAPT. STRONG: I think the best answer
8 you're going to get though from anywhere is
9 you're going say under normal conditions these
10 are our limits, but under abnormal conditions it
11 will be greater. And so, I mean, for the long-
12 term planning that's what we always run into is
13 customers asking us, well, how big a ship can I
14 get in here, and I say, well, how often do you
15 want to come in? I can't guarantee that that
16 will be the case every day, but most of the time
17 we can get in.

18 MEMBER RASSELLO; Yes, but nowadays
19 with increasing of the ship size, we really work
20 on very limited data to play with. Not much room
21 to play with. So we accept some consolations,
22 but at least to approve a port or not I need to

1 have some standards data.

2 CHAIR PERKINS: So would real time air
3 gap capability from ports in the approaching
4 implementation of autonomous hydrographic survey
5 depth measurement -- are we getting close to
6 needing real time bottom measurement from
7 autonomous systems to complement the real time
8 air gap? Do you see that as in the future,
9 Captain Strong?

10 CAPT. STRONG: I don't think here in
11 this port. I think ports are subject to
12 shoaling, maybe, but I don't -- having the air
13 gap and that process, that's all we need. Our
14 bottom doesn't change that much. But if you know
15 the air gap, then you're going to know the tide,
16 right, kind of thing.

17 CHAIR PERKINS: Gary?

18 MEMBER JEFFRESS: This is a question
19 for Julie. Julie, one of the things the Panel's
20 been discussing several times in the past is how
21 to transfer funds from different federal agencies
22 to do cooperative projects, and particularly the

1 Corps of Engineers. But I believe you said that
2 your funding goes back to the 1980s with a
3 cooperative arrangement with the Corps. So I was
4 wondering how did you do that and what sort of
5 mechanism is in place to make that happen? And
6 where from the Corps' budget does it come from?
7 Does it come from the district level, the
8 regional level or headquarters?

9 MS. THOMAS: We've been through an
10 evolution since the 1978 when the Corps funding
11 actually -- we started with Sea Grant funding and
12 then state. Then it became the Army Corps in a
13 cooperative agreement. So we've done a few
14 things. It actually started out -- George
15 Domurat, San Francisco, Army Corps was very
16 instrument. Charlie Chestnut. People that know
17 Corps people. These were all people that founded
18 CDIP. And that was district funding.

19 But then as we started to expand,
20 particularly out of the State of California, it
21 became obvious that it was too crazy to get
22 district funding from LA, San Francisco, all the

1 different ports, or district offices. So then it
2 became centralized. At that time it was in
3 Washington, D.C. at Fort Belvoir at the Corps
4 headquarters. And then it moved to ERDC. So now
5 all of our Corps funding is actually centralized
6 in ERDC. It's under a CODS president's budget,
7 Coastal Ocean Data Services. And part of that
8 funds the Army Corps.

9 It used to be -- well, it went from
10 district funding and then it was an earmark for a
11 long time. And then when earmarks kind of went
12 out of style, we worked very hard -- well, people
13 within the Corps worked hard to move it over to
14 the president's budget. And it's actually under
15 -- it used to be in General Investigations, but
16 now it's under the O&M. That's a little bit I
17 think a sore topic with the Corps because it does
18 -- it is part of the dredging budget. And I
19 don't know. That's kind of been out of my
20 purview. But I know it is out of O&M right now
21 and it is a line item through the Corps. And
22 then we also have managed to get a little bit of

1 an add-on through Congressional support, too.

2 MEMBER JEFFRESS: When you say O&M,
3 that's the O&M from --

4 MS. THOMAS: Oh, Operations and
5 Maintenance of the Army Corps.

6 MEMBER JEFFRESS: Yes, but the
7 dredging budget?

8 MS. THOMAS: Yes.

9 MEMBER JEFFRESS: Okay.

10 MS. THOMAS: As far as I understand
11 that. By the time -- like I said, it's all
12 centralized through ERDC right now. But we've
13 also -- there is another piece to the pot,
14 because we've been masters at getting our funding
15 from different federal and state agencies. We
16 did have this cooperative agreement with the
17 State of California. So since 1985 all of the
18 Corps funds were routed through the state, and
19 that was wonderful.

20 For those of you that know what type
21 of overhead the universities of California have,
22 you can understand why we encourage that. And

1 but we also now have -- just this year we have a
2 cooperative agreement with the Army Corps
3 directly. So it's evolved over the years. It
4 kind of depends on what's happening at the time,
5 but we've been masters at trying to move money
6 back and forth.

7 We also get Navy funds. A lot of
8 these buoys that were up there are supported
9 through the NAVY, and that's MIPR'ed directly to
10 the Army Corps.

11 CHAIR PERKINS: Great. We're right at
12 our scheduled time, so we'll conclude this
13 session with a closing comment from Andy.

14 MEMBER ARMSTRONG: Yes, for Julie. So
15 it seems that institutions like Scripps and like
16 UNH where I work and others have the advantage of
17 a lot of oceanographic and marine geology science
18 and understanding. So in your case it might be
19 wave and current data, and some others it might
20 be regional coastal processes. So it seems to me
21 that there's some potential gain from interaction
22 with the charting agencies and the scientists who

1 kind of understand regionally the things that
2 might affect precise navigation in a particular
3 area. Could you comment on that?

4 MS. THOMAS: Yes, actually I get the
5 comment often how come these buoys aren't
6 directly under NOAA, and why is the Army Corps
7 interested? And I go back that the reason why
8 this program is actually at Scripps is because
9 the closer to the shoreline you get regional
10 sediment management structure. The Corps is
11 interested. They're responsible for structure
12 design along the shoreline. They're interested
13 in very -- they want to know the thresholds for
14 design. They want to know the sediment budgets.

15 And we have a really strong team,
16 academic, that dedicate their life to figuring
17 these things out. We spend a lot of time on
18 quality control with these buoys. The Navy uses
19 them for very high proficient precision
20 maneuvers. So the accuracy and the real time
21 quality control on these systems is really what
22 has kept it at Scripps. And I think that people

1 that use the system have realized the
2 academia/federal partnership works really well
3 here.

4 And to me this is kind of the coastal
5 intelligence that NOAA talks about. I didn't
6 mention that earlier, but I'm very involved with
7 a lot of the quality control efforts and I think
8 that there's this coastal intelligence that goes
9 into coastal resiliency that is very important
10 and programs that come through academia. I'm a
11 big advocate for them because we can be 24/7. We
12 can be operational. We get 99 percent, 100
13 percent reliability on these buoys with 60 of
14 them out there. So we work very hard for that.

15 I know you're out of time. I can see
16 Scott ready to go.

17 CHAIR PERKINS: Well, I completely
18 lost control of the schedule yesterday, so I'm
19 going to try to do better today.

20 (Laughter.)

21 CHAIR PERKINS: So thank you very
22 much. Applause for our panel, please?

1 (Applause.)

2 CHAIR PERKINS: We have a brief 10-
3 minute break and then we have the Southern
4 California Regional Stakeholders Panel. So,
5 thank you very much.

6 (Whereupon, the above-entitled matter
7 went off the record at 10:19 a.m. and resumed at
8 10:40 a.m.)

9 CHAIR PERKINS: All right. We'd like
10 to get back on track here and reconvene and start
11 our Southern California Stakeholder Regional
12 Panel. And Regional Nav Manager Jeff Ferguson is
13 going to do the panelist introductions for us.

14 So, Jeff, thank you for that.

15 MR. FERGUSON: Yes, so, well, I'm
16 going to tap dance for a few minutes while we
17 finalize the IT and do all the introductions now,
18 so when it's time for the next speaker we'll just
19 roll right through.

20 So I think we got a real good panel
21 today. I'm going to give a brief overview.
22 Again, I'm Jeff Ferguson. I work for Coast

1 Survey as the California Navigation Manager. I
2 have 25-plus years working with NOAA in various
3 mapping and charting positions. And I've been
4 here on the ground in California since just
5 November replacing Gerry Wheaton who had the job
6 for about a decade. So I'm still coming up to
7 speed on some of the local issues, but I'm the
8 point man out here.

9 And then next on the panel, we'll
10 listen to Mr. Tom Cullen. He's the administrator
11 for the State of California Office of Spill
12 Prevention and Response, or OSPR. And California
13 is pretty unique in that the state government
14 takes a very active role in the Harbor Safety
15 Committee framework and in maritime safety in
16 general. So it will be interesting to hear from
17 him.

18 He was appointed by Governor Jerry
19 Brown as the administrator in June 2012. He
20 directs a team of scientists and environmental
21 specialists, game wardens and support personnel
22 in protecting and preserving the 3,400 miles of

1 shoreline and almost 8,000 square miles of state
2 waters from oil and other substances.

3 Prior to his appointment, Captain
4 Cullen served in the United States Coast Guard
5 for 31 years, including serving as Deputy
6 Commander of Coast Guard Sector San Francisco,
7 where he performed a wide range of federal
8 authorities in the San Francisco Bay Region. He
9 received a bachelor of science in ocean
10 engineering from the Coast Guard Academy and a
11 master of science in industrial administration
12 from Purdue University.

13 So we're happy you can make it,
14 Captain Cullen.

15 Then we're going to have Jim
16 Haussener, Executive Director of the California
17 Marine Affairs and Navigation Conference. So we
18 spent a lot of time talking about big ships
19 coming into big ports, but I'm hoping Mr.
20 Haussener will give us a little broader
21 perspective of some of the smaller harbors and
22 other traffic that comes through state waters.

1 He has over 30 years of experience in
2 the California maritime industry where he has
3 been the harbor master of the Cities of San
4 Leandro and Vallejo, as well as assistant harbor
5 master for Pillar Point Harbor and the harbor
6 patrol officer for the City of San Mateo.
7 Currently he is executive director of the
8 California Marine Affairs and Navigation
9 Conference, or CMANC, the trade association that
10 represents the objectives of California ports,
11 harbors and marinas.

12 And then finally we have Mr.
13 Christopher Cannon, Director of Environmental
14 Management for the Port of Los Angeles, and he's
15 going to have a -- take us a little different
16 subject matter, talking about hydrography and
17 hydrodynamic models in the Port of LA and how
18 they use that in their environmental programs.

19 He is again the Director of
20 Environmental Management for the Port of Los
21 Angeles, a position he has held since October of
22 2010. He is responsible for balancing commerce

1 and growth with ecological sustainability at the
2 nation's busiest container port.

3 He also spent years as Legislative
4 Assistant for Environmental Policy on the
5 Washington, D.C. staff of U.S. Representative
6 Martin Sabo. He received a bachelor's degree in
7 international relations from Dartmouth College
8 and a law degree from the University of
9 California at Berkeley.

10 Are you ready?

11 PARTICIPANT: I think so.

12 MR. FERGUSON: Prefect timing. All
13 right. Let's see if my clicker works. There we
14 go. So I just did that, so we'll roll right
15 along.

16 So the Office of Coast Survey has
17 regional navigational managers located around the
18 country, and we're kind of the local
19 representative on the ground to work with the
20 pilots an port authorities and local stakeholders
21 to learn about what they need from NOAA.
22 Although we work for Coast Survey, we take a much

1 broader perspective and represent navigation
2 services as a whole. And basically we have the
3 NOAA logo on our business card, so if anybody
4 comes to us with questions about maritime weather
5 or anything that NOAA does, we certainly try and
6 help them.

7 And so my territory there is the State
8 of California. Like I said, I've been here since
9 November of last year.

10 Just to kind of level set us for a
11 second, I wanted to pull up the chart of LA/Long
12 Beach. I know you can't see the interior very
13 well, but I wanted to highlight a couple points
14 here. The green line, I highlighted the
15 breakwater. So the breakwater is, quote, "owned
16 and maintained by the Army Corps of Engineers."
17 So when we had the breach last year over the
18 storm, it was the Corps of Engineers who
19 responded, found the emergency funding and fixed
20 it. And of course they maintain channels and
21 take care of that. And then there's the offshore
22 anchorage which the U.S. Coast Guard defines and

1 the Marine Exchange works with the Coast Guard to
2 assign ships to those anchorages.

3 Inside the breakwater is then where
4 the port authorities come into play. And so I
5 put a red line there to give the approximate
6 division between the Port of Long Beach and the
7 Port of LA. So to the right or to the east of
8 that red line is the City of Long Beach, the port
9 of Long Beach. Jacobsen Pilots run the ships in
10 and out from there. The Port of Long Beach has a
11 survey department with a land survey team and a
12 hydrographic capacity with a ship and a boat and
13 multi-beam.

14 To the left is the City of learning
15 outcome, the Port of Long Beach. The LA pilots
16 are actually city employees that work for the
17 port. And the Port of LA also has a survey
18 department with land surveyors, hydrographers, a
19 boat with multi-beam.

20 So you have basically three different
21 groups doing periodic surveys in this area, four
22 if you count Coast Survey, which I'll talk about

1 in a second.

2 Most of the port surveyor work is very
3 small and doing specific investigations of the
4 pilots or a tenant has a problem about sand dunes
5 along the wharf and to support the construction
6 projects in the area.

7 The blue arrows I drew was to show the
8 water in flow into the port. So on the Long
9 Beach side that's the LA River. Calling it a
10 river is pretty generous. It's basically a
11 concrete storm drain and with the lack of rain we
12 get, not much flows out of it. And so they don't
13 have to worry about sediment. On the Long Beach
14 side is the Dominguez Channel, which is even
15 smaller. But again, there's not much sediment
16 flowing into the port. So as we were talking
17 earlier, when they do dredge work, it stays
18 dredged and they worry about prop wash moving
19 some things around, but they don't have to worry
20 about sediment transfer like a lot of ports do.

21 So the ports and the Corps, like I
22 said, do do hydrographic surveys. The Corps just

1 like they do everywhere, sends that data to Coast
2 Survey so we can update the charts. The ports
3 have sent us data as well that goes on our
4 charts. We still need to kind of reduce the
5 friction points on that flow, and that's
6 something I'll be working on. But we have used
7 their data, but it's something we need to
8 continue to improve. So that's the port.

9 Coast Survey was here in the fall of
10 '13 with the NOAA ship Fairweather to do a shore-
11 to-shore survey of the area. So again, the port
12 survey teams wouldn't spend any time outside the
13 breakwater, which is technically outside their
14 sphere of influence. Certainly if the pilots
15 found something in the anchorage and they needed
16 something done quickly, they could, but the
17 Fairweather kind of did the offshore and even
18 resurveyed inside the harbor.

19 The preliminary ENC with all that data
20 is in my hands now, and I've shared it with the
21 stakeholders in the area and the official ENC
22 should hit the street in the next week or two.

1 And then the raster and POD products will follow
2 a week or two after that.

3 Here's a graphic showing the AIS data
4 for Southern California. So we're here. All the
5 big traffic that leaves the port is almost
6 equally divided into thirds, where a third of it
7 heads south to the Panama Canal and points south,
8 due west heading out, or northwest through the
9 Santa Barbara Channel traffic separation scheme.
10 You can see a lot of traffic to and from Catalina
11 with all the ferries running back and forth.
12 There's some oil production platforms in the
13 Santa Barbara Channel, so you can see all the
14 traffic support vessels going to and from there.

15 One thing that happened in 2009,
16 California, being forward-thinking and the
17 environmentalists that they are, they put in the
18 low-sulfur fuel regulations before most people
19 did, and so ships, when they got within 24 miles
20 of the coast had to switch to low-sulfur fuels.
21 So one thing they saw was that the ships would
22 stay out just offshore, that 24-mile limit, until

1 the very last minute and then they could switch
2 fuels and then zoom in.

3 As of January 1st of this year it's
4 now a federal requirement out to 200 miles. So
5 now when they're 200 miles off, they have to
6 switch. So we're still waiting to see whether
7 that's going to change the traffic patterns and
8 have -- the people are on low-sulfur anyway.
9 Will they be running closer to shore? So it's
10 just something we're monitoring. We haven't seen
11 yet, but it's just something to keep an eye on.
12 We may have bigger vessels staying in closer to
13 shore now because of those regulation changes.

14 So we talked a little bit about PORTS
15 the last couple days. So this is PORTS as in the
16 Physical Oceanographic Real Time System. It's a
17 public/private kind of partnership where NOAA
18 takes the data stream and then kind of pays for
19 the data ingestion, quality control, archiving
20 and distribution to the public via the Web and
21 other mechanisms. And then on the private side
22 usually a port authority or pilot organization

1 pays for the maintenance of the actual equipment
2 on the ground to collect that data.

3 So LA has a good one. All of these
4 pins around here are weather wind gauges. So on
5 the Long Beach side Jacobsen Pilots pays to put
6 those in and maintains them and then sends the
7 data to CO-OPS for them to make it publicly
8 available. On the LA side the port for them.
9 The one tide gauge is part of NOAA's national
10 network, so NOAA pays for that gauge and
11 maintains it. There's one air gap sensor on the
12 Long Beach side which I believe the City of Long
13 Beach and the port are paying for. LA is in
14 conversations to get one on the Vincent Thomas
15 Bridge, and that should be in shortly.

16 So PORTS in LA/Long Beach works very
17 well. There are other ports in California where
18 that private partnership part they're having
19 problems with. Port Hueneme would like to have a
20 PORT System, but they saw the price tag and they
21 can't come up with the money. San Francisco is
22 kind of running on carryover funds and is

1 struggling right now how they're going to come up
2 with the money to pay for their share. So
3 there's different ports. And I'm sure people who
4 have been on the Panel awhile have heard this
5 conversation elsewhere.

6 So in LA/Long Beach it works really
7 well because the port and the pilot, everybody
8 just stepped up and did it, but there are other
9 ports in California where it's a bigger problem.

10 In LA/Long Beach the PORTS also has
11 the wave buoys that Julie talked about earlier.
12 One kind of communication problem we have with
13 the public is the San Pedro South buoy was
14 intentionally designed just to be for a special
15 project and here for one year. Now, when you go
16 to the PORTS Web site, it doesn't look any
17 different from any other sensor. So the public
18 sees it, they start using the data. The high-
19 speeds ferries to Catalina have told us that they
20 loved that buoy. They use it every day and they
21 don't know that that's going to go away in a
22 year. So we have a communication problem about

1 how to manage these special project buoys. So
2 we're looking to find ways to fund that longer.

3 So all the buoys up and down the West
4 Coast -- it's kind of a great cooperative
5 consortium of sources where we have some of
6 Julie's CDIP buoys, we have some NOAA weather
7 buoys. And most of the data goes to NOAA's Buoy
8 Data Center, NBDC. And so the public can go
9 there and see all the data, but again they don't
10 see who controls what buoy. And earlier this
11 year -- this is a status update from just March
12 of this year, in Northern California all the
13 buoys offshore were out of commission. A couple
14 of them were we think snagged by fishermen and
15 ended up on the beach.

16 But so, the sailors heading up and
17 down the coast want to call ahead and see what
18 the waves and weather is doing and they had this
19 huge blackout of information. So they come to me
20 or to other people in NOAA and say, hey, what's
21 happening with those buoys? And then we have to
22 figure out, okay, well, is that a CDIP buoy, is

1 that a USGS buoy, is that a NOAA buoy and then
2 figure out how we can get it fixed. So at one
3 level it's a great example of different agencies
4 cooperating, but when something bad happens the
5 fingers start flying and we got to figure out how
6 to communicate that better with the public.

7 Shifting gears a little bit, Dr.
8 Callender is head of NOS, is also in charge of
9 the Office of National Marine Sanctuaries. So
10 California has a pretty robust sanctuary system.
11 The big one Monterey Bay Sanctuary. And then up
12 north we have Gulf of Farallones and Cordell
13 Bank. Just a couple weeks ago NOAA announced
14 that Cordell Bank and Gulf of Farallones is going
15 to basically double in size. Congress has 45
16 legislative days to veto that, but if they don't,
17 they're going to extend all the way up to Point
18 Arena. And so California will be coastal marine
19 sanctuaries from Port Arena in Northern
20 California all the way down to Central
21 California.

22 And then down here in Southern

1 California we have the Channel Islands National
2 Marine Sanctuary. And they're pretty active in
3 working with the local maritime communities. The
4 separation fairways actually run right through
5 the sanctuary because the sanctuary boundary runs
6 pretty far offshore. So yesterday when we were
7 at the Marine Exchange, Kip talked about the
8 speed reduction, Voluntary Speed Reduction
9 Program at 20 and 40 miles. So the marine
10 sanctuary actually, through funding from the
11 Santa Barbara County Air Quality Board, extended
12 that program for ships to stay at 12 knots or
13 less all the way through the Santa Barbara
14 Channel.

15 So it's an interesting group of people
16 where you had the Air Quality Board on land
17 working with the marine sanctuary offshore who
18 wants to save the whales working with the
19 maritime industry and the ships passing through
20 there. So the funding allowed a ship, that if
21 they stayed at 12 knots through that whole
22 channel, would get a check for 2,500 bucks when

1 they hit port. So again, that funding came from
2 the air quality boards on land and we had a whole
3 bunch of companies enrolled. So it was an
4 interesting program.

5 And the National Marine Sanctuary's
6 Advisory Counsel has a Marine Shipping Working
7 Group that they just spun up. So again, it's the
8 marine sanctuary working with the shipping lines
9 and the Coast Guard and all the local interests
10 to make sure the traffic around and through the
11 sanctuary is safe for the environment.

12 And that's where I work up in Santa
13 Barbara. So that's my viewpoint from the
14 California Nav Manager. Are there any quick
15 technical questions, anything I said, or should
16 we flow into the next speaker?

17 CHAIR PERKINS: Yes, I think if we
18 flow into and then we'll take all the questions
19 at the conclusion.

20 MR. FERGUSON: Sounds good. So I'll
21 introduce Mr. Tom Cullen, the administrator for
22 State of California OSPR.

1 (Applause.)

2 CAPT. CULLEN: Well, good morning,
3 everyone. Thank you, Jeff, and welcome to
4 California.

5 So how many out there are from outside
6 the state visiting?

7 (No audible response.)

8 CAPT. CULLEN: Well, this is what a
9 drought looks like. It's deceiving. It's an
10 extreme drought. Some of you might have been
11 watching the news and saw that the governor
12 announced earlier this week a 25-percent cut, a
13 target for further water reduction usage. And it
14 really underscores the importance of what me and
15 my team try to do in Sacramento, which I'm going
16 to talk with you a little bit this morning, give
17 an overview of how we protect the state surface
18 waters, particularly when in times like this
19 they're becoming more scarce and in need of that
20 protection.

21 I want to give a couple quick call-
22 outs. Admiral, it's good to see you again.

1 Thank you for coming and visiting our two Harbor
2 Safety Committees that I went to last year here
3 at LA/Long Beach and then Port Hueneme and
4 showing the importance of those committees.

5 Great to see Kip Louttit, John Strong,
6 Laura Coverie, a lot of partners, Rob McCoughey,
7 that you heard Julie and others speak about, the
8 partnership that makes California so strong and
9 helping me achieve my goals. It's kind of
10 interesting that 32 years ago I graduated from
11 the Coast Guard Academy with a degree in ocean
12 engineering and it's only now that I'm coming
13 full circle and starting to see some of the
14 benefits of that degree in trying to understand
15 some of the things that you're working on.

16 So not only do I want to describe a
17 little bit about the Office of Spill Prevention
18 Response, or OSPR from this point forward, and
19 where we came from, but a little bit of a
20 discussion about what you heard about our
21 relationship with the five Harbor Safety
22 Committees in the state.

1 Next slide, please. So OSPR was
2 created about the same time as the Federal Oil
3 Pollution Act of 1990, OPA-90. We have something
4 similar in California called the -- we call it
5 Lempert-Keene-Seastrand. It's the Oil Pollution
6 and -- Prevention and Response Act of 1990. The
7 result of two big spills that big happened.
8 You're all familiar with the Exxon-Valdez,
9 750,000 barrels back in March of 1989. And then
10 here down in Southern California in Huntington
11 Beach the following February was the American
12 Trader spill, and that was about 10,000 barrels.

13 So similar to the federal authority,
14 the state created an entity within the Department
15 of then Fish and Game to basically provide a
16 protective umbrella, which you see in a next
17 slide, to protect the state, provide the best
18 achievable protection. And there's a couple
19 other buzzwords that are in the statute: leveraging
20 best achievable technology, providing best
21 achievable wildlife care through something that
22 we have called the Oiled Wildlife Care Network.

1 Many of you that are in the shipping industry are
2 familiar with that in your contingency plans.

3 And ultimately with our response measures
4 providing what is the net environmental benefit
5 to the protection of the habitat and species.

6 Next slide, please. A little busy
7 slide. I apologize. I hate lots of words on
8 slides, but I want to give just a sense of the
9 various things that go on underneath that
10 protective umbrella of prevention, preparedness
11 response, and then within a response, restoration
12 and recovery.

13 The big things that I would point out
14 up there among that busy list would be a
15 requirement for oil spill contingency plans
16 through plan holders, shipping companies, anybody
17 that moves, transports, stores oil of any volume
18 in the state. They also every couple of years
19 have to prove their standing through a
20 Certificate of Financial Responsibility, their
21 ability to leverage -- to deploy resources should
22 a spill happen. Also, we conduct many dozens

1 of spill exercises, anything from a national
2 preparedness exercise every three years down to
3 simple unannounced notification drills making
4 sure that people know who to call within a
5 certain time frame should a spill happen.

6 Next slide, please. So we have about
7 two dozen offices located throughout the state.
8 It's probably important to note that when we were
9 created back in 1990 we were a maritime only, so
10 a coastal tidally-influenced waters organization.
11 And so hence, we're a little bit closer to the
12 shore. We'll talk a bit about how we've expanded
13 beyond that in the recent year.

14 And then it's not really to see with
15 the color coding along the right-hand chart,
16 which I by the way pulled from a very nice
17 NOAA/University of New Hampshire product called
18 ERMA, which I'll talk a little bit about later --
19 that shows where we've developed areas
20 contingency plans, basically site protection
21 strategies, sensitive sites, what to do when a
22 certain type of product enters the water. What

1 are the priorities? How do we handle it? What's
2 important to note is that everything east of the
3 coastal region is somewhat exposed. We don't
4 have plans in place yet.

5 With the expansion statewide; again,
6 I'll give some more details here, we're going to
7 grow our staff from about 250 to 300 people made
8 up of law enforcement wardens, who are usually
9 the first responders to arrive and assess the
10 situation, environmental scientists. We have a
11 specialty -- Captain Jeff Cowan, my
12 representative to the Port Hueneme Harbor Safety
13 Committee back there is one of our oil spill
14 prevention specialists, and OSPS. And then of
15 interest to probably this group here we have a
16 very heavy GIS presence in Sacramento that
17 maintains the different layers in ERMA.

18 Next slide, please. So the left slide
19 shows that oil can spill anywhere, not just in
20 the marine region. This is a three-year period
21 of reports that were taken by the California
22 Office of Emergency Services. And any given year

1 there might be between 8,000 and 10,000 reports.
2 You can almost pick Interstate 5 going north to
3 south -- and of course there's probably a lot of
4 truck rollovers and things like that.

5 It's interesting to look at the right
6 hand slide. What you see are some of the more
7 predominant state waterways superimposed with the
8 red lines of being rail. We've heard a lot
9 recently in the news about the crude by rail, the
10 energy renaissance that's happening in this
11 country. So the very high-quality, low-sulfur
12 light crude coming out of the Bakken formation in
13 North Dakota, also the tar sands from Canada,
14 hasn't been coming into California in great
15 volume yet, unlike other parts of the country,
16 but within the next couple of years, based on
17 what we can put together through permit
18 applications for various facilities are near
19 refineries and so forth, we're expecting between
20 6 and 10 what we call a unit train, the 100-plus
21 car trains, tanker car trains rolling in the
22 state.

1 And there's about 8,000, more than
2 8,000 water crossings -- I'm sorry, about 7,000,
3 more than 7,000 crossings of rail over state
4 waters. And that's the kind of perpendicular
5 crossings. That doesn't take into account where
6 the rail is running parallel to water. And
7 oftentimes pipeline enjoys the same right of way
8 that rail does. And so there's 5,000 pipeline
9 crossings of various oil products over water. So
10 it's a big concern because we weren't positioned
11 for the previous 23 years with funding to support
12 and respond to inland spills. If we had a
13 responsible party, we will go and work with them
14 of course. But it presented a concern as oil
15 coming into California shifts from the maritime
16 arrival to other means.

17 The other thing I wanted to point out,
18 too, is this is not targeting rail. If you look
19 the volumes of oil that's spilling in the
20 interior of the state, 91 percent of it right now
21 by volume is pipeline breaks. So it's a problem.

22 Next slide, please. So we went to the

1 administration and the legislature last year and
2 kind of waved the flag and said this energy
3 renaissance is great stuff, but we're exposed and
4 we probably need to do something, restructure the
5 way that we are funded, the way that we're
6 authorized or, if you will, restricted by statute
7 to prepare, protect, prevent and respond to oil
8 spills.

9 So what happened was we, in concert
10 with the legislature, drafted Senate Bill 861,
11 which basically took the proven maritime program
12 that you saw described in the umbrella slide, and
13 just expanded it to cover all state waters.

14 Instead of charging our small six-and-a-half cent
15 per barrel or 42-gallon fee on oil arriving at
16 marine terminals, we're now assessing that at the
17 refineries. So any oil that arrives at
18 California's refineries, it will be six-and-a-
19 half cents. Or if you reduce to a \$4 a gallon of
20 gas, it's about a sixth of a penny. And that
21 tells you the volumes of oil that's coming into
22 California if we can fund a program on a sixth of

1 penny per gallon of gas.

2 We've been since June of last year
3 developing emergency regulations, which we're
4 hoping to get out here shortly, that will let new
5 perspective plan holders -- so anybody that pumps
6 water out of the ground, pumps water -- pumps
7 oil. I'm thinking produced water, which is a
8 byproduct of the hydraulic fracturing. Puts in
9 the pipeline. We have airports that are out
10 there that are storing and refueling planes.
11 They become new plan holders. And if they're
12 proximate to state surface waters, they have to
13 provide those things we talked about, a
14 contingency plan, a certificate of financial
15 responsibility and participate in drills and
16 exercises with us and other partners like the EPA
17 and Coast Guard, locals, to show that we can
18 respond during a spill.

19 Next slide, please. On the response
20 side we exercise all the time something called
21 the Incident Command System, which I'm sure many
22 of you are familiar with. It's part of the

1 National Incidence Management System managed by
2 FEMA. And so you have something called a unified
3 command. And within the unified command there's
4 traditionally three major participants. You have
5 the federal side. And so our big partner there
6 had been the Coast Guard. Now we're starting to
7 work with the EPA more closely on some of the
8 interior events.

9 The state, my office provides a state
10 on-scene coordinator. You have the responsible
11 party. They're the ones who are going to be
12 coming in and providing the resources, the
13 funding to quickly manage the response. And
14 there's something we learned from the Cosco Busan
15 spill that was of critical importance was the
16 introduction of local governments. So we have a
17 local government on-scene coordinator. Not
18 showing up there in the little triangle, but it's
19 something that we have found is a best practice
20 in a response.

21 Some of the key roles that our office
22 fills would be like the environmental unit

1 leader, wildlife section chief and something that
2 we call the SCAT Teams, the Shoreline Cleanup
3 Assessment Teams. And this is where we really
4 rely on that really nifty product called ERMA,
5 the Environmental Response Management
6 Application, which you and University of New
7 Hampshire manage for us. And it is a very useful
8 tool.

9 Next slide, please. So now we're
10 shift a little bit into -- I didn't realize there
11 were animations. I apologize for that. That's
12 what happens when you pirate somebody else's
13 slides.

14 So another busy one. I apologize.
15 But there is statutory authority for my position,
16 our office to work with the Harbor Safety
17 Committees. We're mandated to have five of them,
18 and we do, in the State of California. And then
19 there's also some pilotage responsibilities,
20 hence our particular interest in some of the
21 products like PORTS that are provided in the
22 harbor complexes.

1 Next slide, please. So we have five
2 Harbor Safety Committees running north to south:
3 up there in North Country, Humboldt Bay; then the
4 whole big San Francisco region to include
5 Stockton, Sacramento, Suissun Bay; Port Hueneme
6 north of here; Los Angeles/Long Beach; San Diego.
7 I appoint not only the chairman of the
8 committees, but also members from the various
9 industry groups, other groups. They take an oath
10 and they do annual harbor safety plans. And it's
11 just a real example of world class cooperation
12 and protection of the commerce in our ports.

13 Next slide, please. This shows you
14 the diversity of membership. Jeff, it's great to
15 have you filling those big shoes of Gerry
16 Wheaton. I don't think I attended any Harbor
17 Safety Committee that Gerry was not only in
18 attendance, but stealing the stage and really
19 providing some very valuable insight for many
20 years. And so we're thrilled to have you with
21 us.

22 At the very bottom, you might not

1 familiar with those two. That's the California
2 Coastal Commission and the Bay Conservation
3 Development Commission, two also very active
4 interested participants in the Harbor Safety
5 Committees.

6 Next slide. Just a couple of the
7 qualities of the committees. I just want to
8 point out that three of our Harbor Safety
9 Committees -- well, two Harbor Safety Committees
10 three times have won National Harbor Safety
11 Committee of the Year. John Strong in Los
12 Angeles/Long Beach once and then San Francisco
13 Bay twice.

14 And one more slide. I asked for some
15 examples of some of the great things that they're
16 doing in each one of the Harbor Safety
17 Committees, and I was so thrilled that our Panel
18 was preceded by that remarkable project right
19 here that's going on in Long Beach. Julie was so
20 kind to host me up at Scripps last month. Had a
21 chance to see the HF tool and talk a little bit
22 more about this great project that Rob McCoughey,

1 Tom Jacobsen, the rest of the team down here has
2 been putting into place. And we're hoping that
3 we're going to take that and cascade it to
4 California's other busy ports. Great example of
5 the synergy, what cooperation can do.

6 So with that, thank you so much for
7 inviting me to participate with you here today,
8 and I'm looking forward to your questions after
9 the next two panelists.

10 (Applause.)

11 MR. HAUSSENER: Okay. Now you can go
12 to sleep because there's no slide show, or you
13 have to stay awake because there's no slide show.

14 I'm Jim Haussener. I don't know if
15 anybody remembers, I was here in 2008. I'm not
16 sure if any of the Committee members are around
17 from that point. But thank you. I guess I did
18 not upset you enough at that point, or you can't
19 remember exactly what I did or didn't say.

20 I would like to comment about LA
21 County, and I think it's appropriate you're here
22 in LA County. I don't know if anybody knows that

1 the National Ocean Service road map -- that
2 actually the picture on that is Marina del Rey
3 and the beaches of Marina del Rey as you're going
4 up.

5 CMANC is a regional port group similar
6 to American Association of Port Authorities. We
7 represent all of the ports and harbors that have
8 navigation projects. So LA/Long Beach up to
9 Crescent City, Noyo, Port San Luis. So large and
10 small. California is unique because we don't
11 have a state port agency. There's nobody in the
12 governor's office or the executive branch at all
13 that has a portfolio that says "ports" on it.
14 There are discrete pieces, such as Tom that's
15 doing certain things, but nobody representing the
16 ports. And so, we go back to Washington and work
17 primarily to get more money to come to California
18 because so much of it's collected here in
19 California.

20 I do want to make a couple of
21 statistical points. About 40 percent of the
22 maritime trade by dollar goes through California;

1 the number fluctuates a little bit up and down as
2 we're doing well and doing poorly. Right now
3 we're doing poorly; everybody's heard about some
4 of our congestion problems. This creates about
5 1.6 million jobs, about \$30 billion in personal
6 income and federal tax revenues of various sorts.
7 There's 107 different federal taxes and fees on
8 the maritime industry of about 10 billion bucks a
9 year.

10 On the recreational boating side --
11 and I was asked to talk a little bit about that
12 -- there's about an \$8½ billion economic impact
13 in California alone. Over 800,000 registered
14 boats. That doesn't include the documented boats
15 such as the one I have here in California. About
16 3,000 boating industries and 70,000 folks working
17 in that.

18 Commercial fishing, which is a very
19 important component, especially for our North
20 Coast, about \$250 million worth of fish landings
21 per year.

22 I'm going to veer a little bit off of

1 some of my notes as I took on the plane as I was
2 coming down here this morning. I want to talk a
3 little bit about supply chain briefly for a
4 second. California ports are investing heavily
5 into their infrastructure inside the gate.

6 Hundreds of millions to billions of dollars per
7 year. When I was here in 2008, I told you that
8 they had a debt load of \$3.5 billion at that
9 point because of all the infrastructure they were
10 putting in. Nationwide California ports are
11 putting about \$2 billion a year into the
12 infrastructure.

13 What we've discovered is we got great
14 infrastructure. We don't have the processes or
15 the innovations in order to make the supply chain
16 work very well. Somewhat similar to the same
17 questions you've been talking earlier today about
18 what sort of innovations do we need in order to
19 make these processes work faster, smoother and
20 get them to the end product. So you're talking
21 about data. We're talking about goods movement
22 to a certain extent.

1 Costs are a driver. California, we've
2 got an excellent environmental record. The
3 SCCOOS was mentioned earlier. Some of the other
4 things we're doing. We have the highest cost per
5 container of any other place you can bring a
6 container in to North America. So what we need
7 to do in order to drive that cost per container
8 down, more containers. And so, we certainly are
9 working on that.

10 I want to let you -- some statistics
11 here again. From 2006 to 2013 container growth
12 in the United States grew by less than a half-
13 percent. Container growth in Canada grew by 25
14 percent. Container growth in Mexico, 80 percent.
15 Mexico is not part of the low-sulfur ecosystem.
16 Canada and the United States are, but not the
17 Mexicans. That may have an impact on some
18 environmental stuff as we move forward.

19 What we need in terms of supply chain
20 is partnership and collaboration to achieve the
21 high environmental standards while increasing the
22 container throughput that I mentioned a little

1 bit earlier.

2 So off that soap box; now onto my
3 survey soap box. And this is somewhat the same
4 sort of stuff I talked to you about before. And
5 I work a lot with the Corps on dredging. And Mr.
6 Hanson is one of those guys who dredge. And I
7 tell the Corps there's no point in dredging
8 because until you post the surveys, it's like you
9 didn't dredge the channel at all. And then we
10 get into how deep is the channel? Where is the
11 bottom? When I was in Vallejo the Navy was
12 paying Scripps to determine where the bottom was
13 because the bottom was actually scrubbing the
14 bottom paint off of the Ohio-class nuclear
15 submarines. And because the density was variable
16 and where actually is the bottom? We need to
17 work on that a little bit.

18 So some of the things I talked about
19 a little bit back at that point is do we need the
20 highest standard? Do we need a NOAA standard?
21 Do we need to talk a little bit about risk? The
22 earlier panel talked a little bit about risk.

1 Should we be taking a look at some of the risk
2 factors that go into that? Do we need to get
3 down to a hundredth of tenth of an inch when we
4 have an error factor of six inches, or do we
5 round to the nearest foot? Are we making this
6 thing so complex that our costs are going up so
7 the amount of surveys we can do across the entire
8 United States are going down? Is a confidence
9 factor of 95 percent better than a confidence
10 factor of zero?

11 I will say, since 2008 to today, the
12 number of high-priority places in California that
13 need to be surveyed has dropped down to I think
14 just off of Port San Luis, looking at the latest
15 on your Web site. Back then it included Port
16 Hueneme, San Francisco Bay and I think a little
17 bit off Huntington Beach down here. So there is
18 progress being made in California, but I think we
19 need collectively to take a look and see exactly
20 what do we need to do in order to deal with the
21 risk as we move forward?

22 The other -- and I'll just mention --

1 I'm going to mention a little bit later
2 crowdsourced data. One of the things is I think
3 NOAA can work on the QA/QC stuff, and let's start
4 taking a look and seeing if we can't get more
5 crowdsourced data out there and available to
6 folks. And I'll talk about that as we move
7 forward.

8 So I want to encourage NOAA to develop
9 standards so that data sets are comparable and
10 compatible. You heard that just a little bit
11 before the break. We don't believe that all data
12 has to be the highest standard; it's more
13 important to make certain that the appropriate
14 QA/QC is working right. Jeff talked a little bit
15 about the friction between the port surveys going
16 over to NOAA. And I recall it used to be that
17 the LA stuff in particular went directly over to
18 NOAA and there wasn't any problems. And it got
19 almost integrated directly at that point into the
20 NOAA system.

21 So we encourage a stronger
22 determination about bang for the buck. Just as

1 channels are not dredged annually, perhaps data
2 integration provided by other private or federal
3 partners may be better, which could then allow us
4 to have increased investment in things like
5 ports, IOOS, or even updating in the Coast Pilot,
6 which I love to read as I go up and down the
7 coast and say, "Oh, that bluff is that, or that
8 freeway bridge is there."

9 Switching hats. I'm a recreational
10 boater; I've been doing it in California since
11 the '60s. Last time I was here I told you that I
12 own every chart from Alaska down to Mexico and
13 left them all at home and used a boating Yellow
14 Page book in order to go from San Francisco down
15 to San Diego. So I'm not sure I'm the right guy.
16 I basically tell people, "When you go south, keep
17 the coast on your left; when you go north, keep
18 the coast on your right."

19 (Laughter.)

20 MR. HAUSSENER: Because I actually
21 predate LORAN. So people are complaining about
22 the lost of LORAN and I go, "Wow, I remember back

1 when we didn't have LORAN to start with."

2 As we move forward, I want to
3 compliment a little bit a couple of things that
4 are happening. Your upcoming Chart Tile Service
5 and the Offline Tile Service 5.0 sounds like a
6 great thing. Looking forward to it coming out.
7 Hopefully you folks are apprised what's happening
8 there. I understand there was a presentation at
9 the Miami Boat Show. And I missed that, but
10 certainly want to make sure that happens and
11 moves forward.

12 One of the things we talked a little
13 bit about is Internet connectivity. Getting
14 faster speed so you can get those charts
15 downloaded to your iPad certainly works. Doesn't
16 do you any good to discover all of a sudden
17 you're out of cell phone range and you no longer
18 have that connectivity for those charts.

19 I do want to give a shout out at the
20 same time to the pocket charts. I don't know if
21 everybody's got one of those; I carry them in my
22 sea bag for San Francisco Bay because I go

1 sailing on a lot of other people's boats. I
2 don't know whether they got charts or what they
3 got, but those pocket charts are great. I also
4 own a personal water craft. They're in that as
5 well. So please keep that sort of stuff going.

6 The PDF print on your own is nice, but
7 then you get a half a dozen 8½ by 11 inches of
8 paper that you're trying to squeeze into
9 something.

10 I understand you're working on tide
11 and current projections for a given
12 latitude/longitude rather than a reference point.
13 And certainly we'd like to see that move forward
14 and get that data out to people so we can use it,
15 so we don't have to go, "Well, I'm here at the
16 San Leandro Marina and do I need to use the data
17 point of Robert's Landing, which is two or three
18 miles south? Can I just say I'm here at the
19 marina and give it the lat/lon and there I go
20 forward?"

21 Julie talked about high-frequency
22 radar; I'm a big believer in it. I have a

1 trawler. I don't go very fast going uphill.
2 Coming back down the coast I make another knot or
3 two coming down. So as an example, yesterday I
4 was taking a look at it and off of Port San Luis,
5 which is just below Morro Bay, past Point
6 Conception, you're heading north, life is good,
7 there is half-knot current, surface current going
8 directly south. So if I'm only doing five or six
9 knots going north, it's nice to know that's going
10 there and I can work my way and plan and
11 integrate to go around that. So I certainly want
12 to include that.

13 I talked a little bit about the data
14 repository and the crowdsourcing stuff; I think
15 that's something, again from a recreational
16 boater, we'd like to see NOAA do.

17 The Coastal Buoy Network, Jeff talked
18 a little bit about it; Julie talked a little bit
19 about it. It's getting a lot of focus because a
20 lot of the buoys went out. Well, the buoys are
21 important. I'll sit down there in Santa Barbara
22 waiting to go around Point Conception to the

1 point where the harbor master throws you out
2 because you've exceeded your 14 days while you're
3 waiting. So then you got to go down coast to
4 Ventura, which makes it a longer trip to go back
5 north because you're waiting for that point where
6 the sea and swell and period all work out.
7 Nothing like a 14-foot sea in an eight-second
8 period. You don't go.

9 So that's real crucial to going up and
10 down the California coast, primarily because we
11 don't have an intercostal waterway. We don't
12 have harbors of refuge very close together. If
13 you think about it, Crescent City, Humboldt Bay,
14 Noyo, Bodega Bay, that's all north of San
15 Francisco. That's it in a 400-mile stretch of
16 the coast. And you can't even get into some of
17 those. Humboldt Bay, which is a 45-foot channel,
18 it breaks. And it filled up with 10 feet of
19 sediment in a one-week period about a month ago
20 because of a storm. So we've got some issues.

21 So the Coastal Buoy Network is
22 important. One of the things we want to make

1 sure is that we don't lose focus of that again.
2 Get them all fixed again. Problem solved. Go
3 away. But we want to make sure that somebody is
4 paying attention and we keep it all working
5 together.

6 One of the other things, NOAA was part
7 of a listening session with the Coast Guard and
8 the Corps on electronic stuff. And one of the
9 things I suggested was a dashboard. It would be
10 really nice having high-frequency radar, some of
11 the wind stuff out of Weather Service, some of
12 the buoy data that I can put all onto my iPad so
13 I've got the tools that I want and the tools I
14 need and pick and select depending on where you
15 are. If I'm racing a sailboat, I got certain
16 things I want to see. If I'm cruising in my
17 trawler, I got a few other things I want to take
18 a look at. Need to work on that a little bit.

19 Although not part of your purview,
20 certainly let your folks over at the National
21 Weather Service start working this way as well.
22 We're going from a static to dynamic and

1 certainly want to make sure that they keep up
2 with that. And I'm willing to bet as we move
3 down the road that at some point in that
4 dashboard we're going to integrate the weather
5 stuff. And you heard this earlier about
6 integrating the National Weather Service wind
7 stuff directly onto the charts with the AIS and
8 put it all together. Might make it a little bit
9 too blurry and you'll have to pull certain things
10 out so that you lose sight of what's important to
11 you in that critical area. But being able to
12 combine all that, from a boater perspective, is a
13 great idea.

14 One of the things not in here, and I'm
15 a little concerned about -- my father and I own a
16 boat and we have a professional captain. I think
17 he spends too much of his time with his head in
18 the laptop and not enough time with his head out
19 the window. And I see that in reading
20 Professional Mariner or other things that's
21 becoming a concern. And that worries me a little
22 bit and I think that's one of the things that we

1 in the profession ought to be worried about. How
2 do we work this? And I've heard from some pilots
3 as well about how they used to do it guessing by
4 golly and now everybody's technical and we all
5 got our little iPad, iPhone, whatever and
6 spending too much time here, not enough time
7 looking out the window.

8 Switching topics. Coastal
9 communities. We need a basic framework from NOAA
10 on both your resilience and your intelligence.
11 Preparedness is definitely the watch word going
12 on. The State of California is providing grants
13 to local communities right now. Different things
14 are: assess the vulnerability of beaches to sea
15 level rise and plan for their protection; assess
16 vulnerability of shoreline to expected effects of
17 climate change and identify adaptation
18 strategies; conduct a cost-benefit analysis of
19 strategies for adopting to sea level rise and
20 help the city develop plans for improved
21 resiliency. Those are sentences out of four
22 different grants that got approved back in

1 November. NOAA should be a partner in all four
2 of those, and we need to make sure you are.

3 It's real easy for some person to come
4 along, and there are consultants that will do
5 that, and they'll say, "Oh, that's below grade.
6 That's going to be below sea level." Well,
7 except that's not necessarily what's going to
8 happen because there are some levies or a
9 railroad or something that's not going to allow
10 that area to get inundated. And we need to be
11 intelligent about how we're making those
12 decisions so the communities who have limited
13 dollars, limited resources can invest
14 appropriately to protect and adapt their
15 communities. And hopefully want to make sure
16 you're part of that.

17 VICE-CHAIR HANSON: Jim, on that
18 thought, how much money is the state putting into
19 this?

20 MR. HAUSSENER: This last grant was --
21 the State Coastal Conservancy is \$1.6 million.
22 The Coastal Commission has done 2 million.

1 Coastal Conservancy the previous year I think did
2 another million, million-and-a-half. And the
3 grants run anywhere from -- I think LA County got
4 \$70,000. The Nature Research -- National
5 Research, whatever -- the Nature Conservancy got
6 150,000. So we're seeing more and more of it.

7 The other thing that's been mandated
8 is for all those who are tideland trust partners,
9 which is all the ports and harbors, and some
10 other areas, we have to provide a report to the
11 State Land Commission by 2019 on how we're going
12 to adapt to sea level rise. So again, one of the
13 things, I was talking to an agency person who was
14 trying to push us along and make us do that
15 faster, is I said, "We don't even know what's the
16 outcome of the grants and the studies you're
17 doing now to learn what are the best practices
18 and where we should be putting your time." As
19 well as out State Coastal Commission, the Coastal
20 Zone Management Firm, they came out with some
21 guidelines for sea level rise. All sorts of
22 comments. I think they got over 800 comments.

1 We haven't seen the draft guidelines come back.

2 And so, you're telling us we need to
3 develop plans. You got guidelines that are
4 behind the curtain and we don't know exactly how
5 some of the short-term plans are being developed.
6 And we need to work that one through so we can
7 say, "Hey, here are some great ideas, guys. Go
8 forth and see if this applies to your community."

9 CHAIR PERKINS: John, can I interrupt
10 for just a second?

11 MR. HAUSSENER: Yes, sir.

12 CHAIR PERKINS: Dr. Callender is on a
13 schedule and has to depart, so I just wanted to
14 take a minute to ask if you have any remarks
15 you'd like to make before you have to leave.

16 DR. CALLENDER: I really didn't want
17 to interrupt you. Sorry about that.

18 CHAIR PERKINS: That's all right.

19 DR. CALLENDER: So, no, I apologize
20 that I have to leave; I have an appointment at
21 3:00 in Santa Barbara, and I'm a little bit
22 concerned about driving through LA to get there.

1 But I do want to thank the Panel, frankly, for
2 the engagement so far. I'm seeing a lot of
3 progress in terms of what we're doing and how
4 we're doing it. I'm really looking forward to
5 the report. And I'm not kidding about calling
6 Gerd on Saturday to bother him and see how it
7 came out at the end of the meeting. So I want to
8 just thank you for all of your efforts and your
9 engagement. Sorry about the interruption.

10 MR. HAUSSENER: That's all right.

11 Thank you, sir. Have a good drive. Good luck.

12 Later today you're going to have
13 panels on coastal resilience, coastal
14 intelligent, different rooms. Hope that doesn't
15 mean you work for different masters. And it's
16 got to be combined here at some point as we move
17 forward.

18 National Response Teams. This is
19 important to California. We do get hit with
20 tsunamis. We've had a couple of them in the last
21 decade. The last one was site-specific and only
22 damaged -- actually "damage" is a polite word --

1 wiped out Crescent City and significant damage to
2 Santa Cruz. When it was all said and done,
3 because it was just those two harbors, we didn't
4 have a lot of public damage that was done, and it
5 took almost 30 days to assess there was enough
6 damage to get FEMA to come in.

7 But if we have, similar to the Chilean
8 tsunami, statewide damage, which we do have based
9 upon the current, the direction of the currents
10 moving -- and Julie showed you a little bit of
11 what happens in terms of those shadows. If the
12 storm comes the wrong way, the breakwater at Long
13 Beach gets wiped out. Some comes a different
14 way, the breakwater at Redondo Beach gets wiped
15 out. We've experienced both of those in the last
16 20 years.

17 We could have a tsunami that does
18 significant damage to every coastal harbor in
19 California. Your Team 6 isn't going to be able
20 to get out there and do the job. You need to
21 work with some partners and develop QA/QC: the
22 Corps, fishing groups, dredging contractors, so

1 they can get out and get those channels open
2 again. Because in some of those communities,
3 that may be the only way to get stuff in and out.
4 Humboldt Bay and the North Coast, all their fuel
5 comes in by barge. They have about 11 days-type
6 deal. So that gets wiped out and we wait those
7 11 days because you're going to say, well, San
8 Francisco Bay is more important than Humboldt
9 Bay. Yes, however, they're not going to be able
10 to get any fuel in. What does that community do?

11 So need to figure out how to take more
12 people working so that you're the professional
13 first responders, but you've got a volunteer
14 backup group that's already trained. It's
15 somewhat like the oil spill and birds. You have
16 to have your HAZWOPER certificate before you can
17 go and clean a bird, and there are hundreds,
18 thousands of folks in California who've gone to
19 the training program. So they got a certificate
20 so when they're called up, they're ready.

21 About 10 years ago, you worked on the
22 Coastal Storms Program for Southern California to

1 improve prediction of, preparation for and
2 recovery from coastal storms. About a five-year
3 effort. Lots of great things. I called around
4 to some coastal managers and said, "Hey, what do
5 you think about this?" "Oh, not sure. I'm not
6 sure I ever heard of that." So it gets to one of
7 the things of you might have done great work, but
8 unless somebody is taking it to the folks today,
9 that stuff may not be relevant to people and
10 people may not be aware of it. So need to work
11 on that a little bit as to how to make sure that
12 the targeted audience stays moving ahead.

13 Now a soap box. Would not be Jim
14 Haussener without complaining about the National
15 Marine Sanctuary Program.

16 (Laughter.)

17 MR. HAUSSENER: My organization is
18 actually on record being opposed to any new
19 sanctuaries or any expanded sanctuaries because
20 we've got a variety of issues with them.

21 A personal one. I own a kayak; I go
22 to my local lake to throw the kayak in the water.

1 I got to pay a launch fee, \$4 inspection fee. If
2 the inspector is not there, I can't put my kayak
3 in the water, looking for Coagula mussels or
4 whatever in my kayak that's dry as it goes from
5 my garage to the lake back to my house.

6 I own a trawler in San Francisco Bay;
7 I can't get out of San Francisco Bay into the
8 ocean without going through a National Marine
9 Sanctuary. National Marine Sanctuaries have the
10 right to oversee vessels and restrict vessels and
11 prevent vessels from going through sanctuaries.
12 That's codified in law; they enforce it against
13 personal watercraft currently. Court case is
14 upheld that NOAA does have that authority. So I
15 can see the day -- and I'm paranoid, I'll admit
16 that -- where in order to leave San Francisco
17 Bay, I'll have to pull my boat of the water, have
18 it inspected and certified and all that that I'm
19 not carrying any whole growth, no copper bottom
20 paint, no anti-fouling or fouling materials in
21 the sea chest, etcetera. So that's part of it.

22 Sediment management is an important

1 part of California. The Monterey Sanctuary in
2 its designation document says no dredging, no
3 dredge disposal and that sort of stuff. If you
4 want to take dredge material dredged out of the
5 ocean's sand, put it on a beach just below the
6 Half Moon Bay breakwater, in order to protect the
7 shoreline there, which is eroding away and the
8 highway is eroding way, you can't do it because
9 the sanctuary has a document that says, "Can't be
10 done." Even if the sanctuary manager wants to do
11 it, he or she is not allowed to do it based on
12 their designation document. So we need to work
13 on that one a little bit.

14 Fisheries. The sanctuary folks every
15 so often want to indirectly or directly take over
16 fisheries from the National Marine Fishery
17 Service. And that has some of my coastal
18 communities very upset.

19 The other, Jeff had that neat little
20 slide up there, and you saw how the sanctuaries
21 are expanding north. There is actually a
22 proposal that NOAA shot down that will probably

1 come back to put a sanctuary Central Coast South.
2 Well, how much sanctuary do we need along
3 California? Is the entire State of California
4 that great of a resource? Do we need to have
5 those extra regulations and that sort of stuff?

6 I know that's not necessarily in your
7 purview, but it's one of those things that I need
8 to throw out there from time to time. Thank you
9 very much for your time.

10 (Applause.)

11 MR. CANNON: Good morning. I guess
12 it's still morning. Good morning. Thank you for
13 inviting Port of Los Angeles here and we're
14 excited actually to come and talk to you today.
15 We always talk about hydrographic data when it
16 comes to navigation and safety, but I want to
17 give a little different spin on it today and give
18 you a sense of how we use hydrographic data in
19 the environmental world.

20 But first, just a little bit of an
21 update. You heard Jim talk about congestion, and
22 I guess others have referred to it. We're

1 digging out, and those of you, even if you're not
2 here from California, you've sure read about all
3 the terrible congestion problems that we've had
4 here. And I'm happy to say that it's actually --
5 we're digging ourselves out a lot faster than we
6 thought. We had at one time almost 30 ships at
7 anchor between the Ports of Los Angeles and Long
8 Beach -- actually got up to closer to 40 at one
9 point -- waiting outside of the breakwater to
10 come in and unload at the height of the labor
11 negotiations. This Monday there were two.

12 So we've been able to dig ourselves
13 out. There's less than five now I think today.
14 And while we've got another 20 that are on their
15 way, they were slow steaming because there was a
16 whole bunch of anchored ships. And so, there
17 were others on their way that just kind of slowed
18 down. And so now they've kind of sped back up
19 and are coming at the normal rate. But the point
20 is: We're actually making very good progress and
21 pleased to say that the process of digging
22 ourselves out of the terrible backlog of

1 congestion is going well.

2 And that leads me to one other thing.

3 This has led to increased focus on something that

4 has already been a very high priority for us, and

5 that's supply chain and goods movement

6 efficiency. And I think Mike Christensen was

7 here this morning and he's doing that very thing

8 now with the Port of Long Beach. And there are

9 several of us from the Port of Los Angeles who

10 are equally interested in that. And the basic

11 idea is if you can move the goods faster and more

12 efficiently, you help the cargo owners. And you

13 also, from my perspective, reduce the

14 environmental impacts. So all of it works out

15 well.

16 So, let's see. I want to make sure I

17 work this right. I just push this? Good.

18 Okay. So hydrographic data is

19 something that all of us who have any experience

20 with marine science are familiar with. It's

21 typically involved with safety and navigation,

22 bathymetry and certainly understanding what's

1 going on near the ports and so forth for purposes
2 of understanding how to move in and out. And
3 this has been particularly important for us to
4 follow over the years, and certainly is important
5 for our port.

6 But the environmental uses are
7 becoming more and more important. Particularly
8 water and sediment quality regulations are
9 driving this, but also just environmental
10 planning. What hydrographic data does is,
11 essentially for the environmental world, it
12 allows us to plan for sustainable management of
13 coastal zones. Essentially, it allows us to
14 create a marine and hydrographic data conceptual
15 plan.

16 We can incorporate marine-related
17 topographical features, shallow water features
18 and habitat, key marine vegetation, fresh water
19 outlets and outfalls, and even coastal flood
20 plains. And this allows us to keep track of
21 things like pollution and various other kinds of
22 things that are introduced into the marine

1 environment. And all of this -- using tides,
2 currents and all sorts of things -- are extremely
3 important to us, and that sort of conceptual
4 model is very valuable for us to manage the
5 coastal zone.

6 The other thing and the thing I want
7 to talk about today is something called TMDLs.
8 And it stands for total maximum daily load. The
9 regulations essentially -- to put it into simple
10 terms -- it's the maximum amount of a contaminant
11 that the water column can take before you exceed
12 water quality standards. So that's a TMDL. And
13 so, they rate it for the water. And then also
14 there's a TMDL for the sediment that relates to
15 what is put into the water.

16 And so, for us this is particularly
17 important because at the Port of Los Angeles and
18 the Port of Long Beach, as you know, the ports
19 have been around for over 100 years. And so, we
20 end up having a great deal of legacy
21 contamination in the sediments, going back
22 literally over 100 years. Interesting little bit

1 of interesting tidbit: In the 1920s the Port of
2 Los Angeles was the largest exporter of oil in
3 the world, if you can imagine that. And so, it
4 gives you an idea. And then of course there was
5 a lot of ship building that occurred, World I and
6 especially World War II, and then industrial
7 areas that were developed in the area here in
8 Southern California since then.

9 Two big things ended up being major
10 contaminants that ended up in the sediments. One
11 is DDT, which as you know is something that was
12 used for -- to -- thank you. Pesticide. And
13 then the other is PCBs, which was part of cooling
14 in industrial equipment. It was on ships and all
15 sorts of equipment that is used in the industrial
16 area. So these two things end up being present
17 in our soils.

18 And as a result of the presence of DDT
19 and PCBs, we have this TMDL, which has been given
20 to us, which is an extremely low standard that
21 the Agency set. They basically just took
22 screening levels and said, "Well, you know what,

1 if you exceed the screening level, you got to get
2 rid of it all." And our response was, "Well,
3 wait a minute, it's not really impacting
4 anything." And they said, "Too bad. You got to
5 get rid of it all."

6 Well, the solution would be to
7 essentially dredge the entire part of Los Angeles
8 and Long Beach Harbor literally down to bedrock.
9 We're talking about a billion dollars or more to
10 do this. So obviously not something we could do.
11 So we have a good relationship with the agencies,
12 and we were able to convince them to let us work
13 with them to build a model to try and understand
14 better how all the sediments and marine life
15 interact and the potential impact it can have on
16 water quality.

17 So this is where we began to use
18 hydrographic data. What we did was looked at all
19 of the different land forms; we looked at the
20 bathymetry; we looked at the inflow of particular
21 channels. The Dominguez Channel was mentioned
22 earlier; that's the one that unfortunately is the

1 source of a lot of the DDT and PCBs that are just
2 kind of washed down from industrial areas in the
3 southern part of Los Angeles, as well as other
4 areas, the Palos Verde Shelf, which is outside of
5 the port, but also is a place where there was an
6 awful lot of contamination that's present. We
7 have of course our own channel in berth-deepening
8 activities. There are shallow water habitats
9 that we've had to construct for purposes of
10 developing mitigation credits, and we even have a
11 sediment storage site, where we've had to store
12 sediments.

13 And so, all of these things were built
14 in to our model. And it was very interesting.
15 The model -- and here's kind of way to look at
16 it. There at the bottom is kind of -- it's hard
17 to understand, but what that is is a 3-D model.
18 This is the Long Beach. This is LA, the blue in
19 this model here, which extends past the
20 breakwater. Each of these cells is an
21 independent cell. There are five of them going
22 down to the ocean floor. And it's five cells

1 even if it's -- whether it's 20 feet deep or 80
2 feet deep, there's still five cells. So the
3 cells are a different size. But each cell is
4 designed to operate independently.

5 And it includes water quality data,
6 everything from currents, erosion, shear stress.
7 We look at the bottom bed consolidation; we look
8 at the movement of the marine life through each
9 of the cells, as well as currents. And the idea
10 is to figure out if and how sediments move
11 through the harbor and also the extent to which
12 these sediments -- the contaminated sediments --
13 impact and bioaccumulate in marine life, and in
14 particular fish.

15 And one of the interesting things is
16 not just the sediment impact to the fish in the
17 benthic community, which is of course in the
18 sediments, but actually there is a little bit of
19 contamination in the water. It's not a high
20 amount of contamination, but it's the DDT and
21 PCBs. And so, the fish of course intake an awful
22 lot of water as part of their existence. And so,

1 one of the things that we're studying is how that
2 affects their tissues and if in fact that is
3 coming from our area, or of course whether the
4 fish -- they obviously don't hang out just in the
5 harbor. They go out and move along into the
6 ocean, and so tracking their directions. We've
7 actually tagged some of the fish and we track
8 where they move in an effort to understand this.
9 But this hydrodynamic model has helped us, and
10 it's the data that we talk about here that's
11 particularly important, the hydrographic data.

12 So it's a 3-D model. And as I said,
13 I wanted to share with you how this essentially
14 conceptual model at the Port of Los Angeles is
15 used to help us work with the regulators. And
16 it's something that has not been done by any of
17 the regulators. And so they're quite interested
18 in this model as well. And it's something that
19 they now want us to help them use as they make
20 decisions about TMDLs and water quality. There
21 is a reopener that's built into the regulation
22 that occurs in 2016, which allows us to go back

1 and based on the results of our hydrodynamic
2 modeling and testing to adjust the TMDL
3 regulations.

4 But it's super cool stuff. All of our
5 people are really fascinated by it. And the
6 regulators themselves are excited to work with us
7 on this stuff. And so, it's kind of cutting edge
8 stuff. One of the nice things about working in
9 the Environmental Management Division, or being
10 the director, as I am, is we do an awful lot of
11 cutting edge stuff at the Port of Los
12 Angeles/Long Beach. And this is an example of
13 something that's never been done, so it's really
14 very interesting.

15 So just to kind of summarize the ideas
16 here, hydrodynamic and sediment transport
17 modeling is going to be as good as the data that
18 we input. And so, the kinds of science and the
19 work that this group talks about, and the people
20 who are participating -- that you do is critical
21 and we support it. And we also make great use of
22 it. Obviously the better the model, the better

1 prediction of sediment transport, which for us is
2 critical and could help us avoid nearly a billion
3 dollars in costs and regulators. And it's also
4 quite frankly allowed us to develop a great
5 ongoing relationship with our regulators because
6 of doing something that really hasn't ever been
7 done here at the port.

8 So with that, I'd like to say thank
9 you. And if you have any comments or questions,
10 I'll be happy to take them.

11 CHAIR PERKINS: Great. Thank you, Mr.
12 Cannon.

13 (Applause.)

14 CHAIR PERKINS: Well, that was a lot
15 of information, so I'm sure the Panel has
16 questions. But, Mr. Cannon, where are you
17 getting your benthic data from?

18 MR. CANNON: We do a lot of sampling.
19 We actually sample the sediments and analyze
20 them, so we've got a team that does that. So
21 that's where the benthic data is coming from;
22 it's sampling and analysis.

1 CHAIR PERKINS: Great. Thank you.
2 Dr. Maune?

3 MEMBER MAUNE: Mr. Cannon, you
4 mentioned mitigation credits. Can you give us
5 some clarification of what you're referring to
6 there?

7 MR. CANNON: Sure. Whenever you
8 impact marine habitat as a port -- in other
9 words, if you remove it from the ocean -- you
10 have to pay it back. And so, it's either one to
11 one, or half to one, or one-and-a-half to one,
12 depending upon the value of the habitat.

13 I'll give you an example that's real
14 easy. You've seen pictures of the Port of Los
15 Angeles. In fact, if you could go back to my
16 presentation, I can point to it. Pier 400 is a
17 manmade island; it was built in the 1990s. It
18 was the largest public works project in the
19 United States. Go to the last slide. There.
20 It's in the back. It's here. That's Pier 400;
21 that's completely manmade. It didn't exist. And
22 so by adding Pier 400, we took away all of the

1 marine habitat that existed in its place. And in
2 order to do that, you have to pay it back. And
3 it's an acre for acre, either one acre or half an
4 acre or one-and-a-half acres.

5 And so we had to create new marine
6 habitat in other locations, enhanced marine
7 habitat. This was done under the auspices of the
8 State Fish and Game, which is now Fish and
9 Wildlife, as well as the National Marine
10 Fisheries and other agencies that had oversight.
11 And so, it's a very important thing. We continue
12 to do it. We're going to do this area over here
13 is now going to start to be filled in. And so,
14 we're taking away habitat there. And so once you
15 take away that water -- and of course the
16 agencies define "habitat" as any water regardless
17 of the quality of it. And once you take away
18 habitat, you have to replace it. And so, that's
19 what the concept of a marine credit is.

20 CHAIR PERKINS: Jim, you brought up
21 crowdsourcing, and this Panel has spoken to
22 crowdsourcing going all the way back to when the

1 Panel met up in Anchorage, Alaska, and we used
2 the phrase "a frontier mapping strategy that
3 utilized crowdsourcing," or that "could look at
4 crowdsourcing." So do you have an example of how
5 crowdsourcing has been used effectively that you
6 can share with us?

7 MR. HAUSSENER: Yes, one of the -- I'm
8 not sure if it's Raymarine. One of the big
9 fathometer companies actually is now putting that
10 together for their customers. So they tie in the
11 chart plotter, the fathometer, the GPS all into
12 one unit, and the data goes back to their
13 headquarters, which then they use to update their
14 own charts back to their same people. And I
15 can't remember which company it is; I think it's
16 Raymarine. One of the boat shows I've been at I
17 looked at it. It's very interesting in my mind
18 because frankly the boaters are moving back and
19 forth through a lot of areas and you can pick up
20 an anomaly that way, but you cover much more if
21 you take a look and you saw the AIS with all the
22 high-speed ferries, as an example.

1 Could you then put that in there and
2 pick up some of their routes? San Francisco Bay,
3 we have the bar pilots going in and out of the
4 bar every day multiple times. Can you pick it up
5 off of them and that way you get to know that
6 you're getting more and more of the channel. You
7 don't have to have your own vessel go out to the
8 triple beam, take the time to get the results,
9 analyze and post it.

10 So, yes, the individual chart plotter
11 companies are doing it themselves and including
12 that into their program.

13 CHAIR PERKINS: Susan?

14 MEMBER SHINGLEDECKER: Jim, I just
15 wanted to thank you for providing such a great
16 recreational boater perspective; I love
17 passionate recreational boaters.

18 I just wanted to kind of reemphasize
19 the point he made about the importance of the
20 buoy network on the West Coast for recreational
21 boaters. We see this with the absence and the
22 wide spread between those ports of safe refuge

1 along the West Coast. We see it with our beacon
2 rental program in terms of there just really
3 aren't that many places to tuck in. And so I
4 thought that was a great point you made about
5 how, especially on the West Coast, boaters really
6 rely on that buoy data when they're making their
7 decisions because there just isn't as much room
8 for error as there might be in other parts of the
9 country. So thank you for that.

10 VICE-CHAIR HANSON: I have a question
11 for several of the panelists. First off, Chris,
12 thanks for that presentation. And also the
13 mitigation stuff is not new; it's actually
14 LA/Long Beach has been a leader in doing that for
15 many, many years. We go back to the original
16 deepening in 1980; we actually had a shallow
17 water habitat as part of that construction as
18 well, followed by the Batiquitos Lagoon work also
19 that really was a primer for all the expansion at
20 the Port of LA/Long Beach. So that's good stuff.

21 MR. CANNON: You no doubt worked with
22 Ralph Appy, I suspect.

1 VICE-CHAIR HANSON: Yes.

2 MR. CANNON: My predecessor.

3 VICE-CHAIR HANSON: Even before that.

4 CHAIR PERKINS: He's really old.

5 VICE-CHAIR HANSON: Yes.

6 (Laughter.)

7 VICE-CHAIR HANSON: So but I want to
8 ask the other two panelists a question, and it
9 has more to do with -- we talked yesterday about
10 outreach, and NOAA talked more about what we do,
11 how we do it, and trying to build support, of
12 course, but also bringing in where we need to go
13 for the future.

14 One of the things we focused on
15 yesterday is at the state level. We do a lot of
16 outreach at the federal level, a lot of
17 partnerships with other agencies, but engaging at
18 the states where the local users are, where
19 there's economic benefit, jobs and all that's
20 part of it, the challenge has been getting the
21 governors to engage in coastal issues through
22 their budget.

1 Can you talk a little bit about say
2 California's budget for coastal issues and maybe
3 the long-term outlook as well? And I think it
4 would probably be best to start with Jim because
5 he's going to be the least political. I know,
6 Captain Cullen, you'll be the insightful, but
7 let's see what you guys have to say about that,
8 please.

9 MR. HAUSSENER: Well, let me back up
10 to the first part where you talked about
11 outreach. And Jeff has got the unenviable job of
12 following Gerry Wheaton. If there were three
13 people gathered along the coast of California,
14 one of them was probably Gerry. So I don't know
15 how he's going to do that.

16 But it's going to take more than what
17 they're doing to get to the people. There's 35
18 million of us here in California. The folks that
19 go to the Harbor Safety Committee meetings from
20 the individual ports are probably the wharfinger.
21 The wharfinger guys don't necessarily communicate
22 with the environmental folks, don't necessarily

1 communicate with the engineering people. The
2 ports have pretty big organizations and
3 stovepipe, and so need to do more than Harbor
4 Safety Committee stuff.

5 Becky Smyth is a person who I enjoy
6 working with; she's one of your resource folks
7 out here based in Oakland. She does a great
8 outreach with the scientists and with the various
9 agency folks, but again not much with the rank
10 and file, the folks who are along the waterfront
11 using the waterfront. So I don't know how you're
12 going to get around that in order to expand the
13 world that you communicate with.

14 To the other part, the State of
15 California and its maritime budget sucks, I guess
16 is the simplest word. For years -- decades --
17 you know, back in 1987 the Water Resources Act
18 said the local ports had to cost-share those
19 federal projects. In California the ports
20 themselves have picked up that cost-share.

21 We've gotten legislation introduced
22 into the legislature. Actually had Congressman

1 Lowenthal -- he carried some stuff for us back in
2 the '90s in order to get the state to pick up
3 one-half of the local cost-share. State governor
4 vetoed one and blue-penciled -- which means he
5 allowed the other bill to go through, but he
6 penciled all the money out of it to move forward.

7 It was not up until the Hamilton
8 Wetland Restoration Project which took dredge
9 material from the Port of Oakland and placed it
10 over the old Army Air Station so that the local
11 residents didn't have to worry about an airport
12 being built right next to them -- to create
13 wetlands that the state actually pumped in money
14 through the Coastal Conservancy, who was a local
15 sponsor for that piece of creating those
16 wetlands. And they then argue that, well, that's
17 our investment into the port system in
18 California.

19 One of the things that -- and don't
20 necessarily want to beat up on Tom. Tom has
21 growing responsibilities and a limited budget.
22 And one of the things he's looking at is why am I

1 the guy who's being looked at with the deep
2 pockets to pay for the maintenance supports?

3 Similarly, I'm a recreational boater
4 and have had lots of ski boats, along with a Jet
5 Ski. My gasoline tax is collected by the state
6 and is supposed to come back to boating.

7 Unfortunately, the state's figured out a way to
8 take that gas tax to the tune of about 35 million
9 bucks a year and catch it before it gets to
10 boaters at all and disappears in the general
11 fund. And so it is a concern as to how do we get
12 folks to work on that?

13 The West Coast governors out here have
14 an Ocean Program. They haven't necessarily
15 funded it. I've chaired their Sediment Task
16 Force. They decided that sediment was not sexy
17 enough compared to marine debris, tsunami stuff
18 and data. So they eliminated the Sediment Task
19 Force.

20 When it comes time for implementing
21 the Regional Sediment Management Plans that Julie
22 talked about that the Corps does with the local

1 sponsors, we've now got a half a dozen of these
2 plans that are on the shelf and no money coming
3 from the state to put it together.

4 The current governor certainly
5 understands waterfronts. The mayor of Oakland
6 lives on Jack London Square. Used to take his
7 dog down on a real regular basis. The previous
8 governor, he didn't discover we had ports in
9 California until he went to China and the Chinese
10 beat up on him as to why we weren't doing enough
11 in the port community.

12 So we have seen stuff. And Chris may
13 talk a little bit about it in terms of some bond
14 money for a little bit of goods movement overall,
15 as well as for clean trucks. Due to the
16 regulations we've imposed on the truckers, we
17 have the cleanest trucks in the nation. We have
18 guys who own trucking businesses here that have
19 opened up trucking businesses on the East Coast
20 and moved their trucks, their 2007 trucks from
21 California to Virginia because they can't operate
22 them here in California anymore, but certainly

1 can operate them on the East Coast.

2 And as a result of that, we've seen
3 air pollution around the ports -- and again,
4 Chris can talk briefly -- 80 percent in terms of
5 particulate matter, in terms of SOx and other
6 pollutants from the port community due to the
7 regulations, due to the ports kicking in money
8 and due to the state through the bonds providing
9 some money.

10 Tom?

11 CAPT. CULLEN: I'm so glad to be
12 sitting next to you, Jim, because --

13 (Laughter.)

14 CAPT. CULLEN: -- you don't have to
15 sugarcoat anything.

16 Wow. We've been so incredibly busy
17 with my office this past year as we have to, I
18 admit, turn our focus a little bit toward the
19 inland, as you saw with some of my slides. The
20 big gaps, the vulnerabilities that we have.

21 That said, I haven't seen anything at
22 all, certainly within my department of Fish and

1 Wildlife, of any of a reduction of an emphasis on
2 the coast. We have, as I mentioned, BCDC
3 California Coastal Commission, which I think
4 would be better entities to address your question
5 about coastal issues.

6 We have a separate fund for cost
7 damages recovered from spills. Well, you know
8 about Cosco-Busan, Dubai Star, other big events.
9 We put that money back into restoration, wetlands
10 projects.

11 One of the things that's going to be
12 a priority for me, for other state agencies in
13 the couple of years to come is going to be the
14 tremendous abandoned and derelict vessel threat
15 that we have, perhaps tens of thousands of these
16 environmental time bombs, if you will, because we
17 don't know what's on them, whether it's any type
18 of an oil product or a heavy metal and batteries
19 or something like that. And we're going to need
20 some emphasis, some help in the legislature and
21 the administration and across a broad spectrum of
22 agency jurisdictions to try to look at that.

1 So I know I'm being a little bit,
2 somewhat evasive, and it's really more because I
3 just don't know the broader perspective of what
4 is being done at the state level and within my
5 Oil Protection Program.

6 CHAIR PERKINS: Great. Thank you.
7 We're at 12:05, so we're a little bit into our
8 lunch hour. So please join me in thanking our
9 panelists.

10 (Applause.)

11 CHAIR PERKINS: So we have 55 minutes
12 on the schedule here for a lunch break, an
13 administrative session for the panelists, and
14 then we'll have a presentation from the Emerging
15 Arctic Working Group followed by a presentation
16 from the IOCM and the National Coastal Mapping
17 Strategy. And then that will lead us into our
18 breakout sessions this afternoon.

19 So thank you again.

20 (Whereupon, the above-entitled matter
21 went off the record at 12:06 p.m. to resume at
22 1:00 p.m. this same day.)

1 Can you hear me?

2 CHAIR PERKINS: I think we hear you.
3 Okay. Great. On the line with us virtually is
4 Mr. David Kennedy. He was the assistant
5 administrator of NOAA's National Ocean Service.

6 And in that role, he has spoken with
7 the HSRP many times before. So, David, welcome
8 back and thank you for joining us.

9 MR. KENNEDY: Can you hear me okay?

10 RADM GLANG: It sounds like you're
11 calling from the bottom of a glacier.

12 MR. KENNEDY: Can you hear me at all?

13 MS. CHAPPELL: Dave, we can hear you,
14 but you're like in a can. Just a minute while we
15 try and work it out here.

16 Can you see your slides?

17 MR. KENNEDY: Yes, I can.

18 MS. CHAPPELL: Okay. Hang on a second
19 while we --

20 (Pause.)

21 MS. CHAPPELL: Can you say something
22 again, Dave?

1 MR. KENNEDY: Testing one, two, three,
2 four, five.

3 Did that work?

4 MS. CHAPPELL: No, it still -- it
5 sounds worse. Are you on a Polycom, or are you
6 on the phone? Sorry, I didn't get any of that.

7 MR. KENNEDY: Can you hear me?

8 MS. CHAPPELL: Yeah, we can hear you,
9 Dave. Still kind of muddy. Can you hang up and
10 call back, please?

11 (Pause.)

12 CHAIR PERKINS: Ashley, do we want to
13 take presentations out of order while we work
14 through the audio?

15 MS. CHAPPELL: Lawson --

16 MEMBER BRIGHAM: Sure.

17 MS. CHAPPELL: -- do you want to
18 start?

19 CHAIR PERKINS: Okay. Standing by
20 while we try to resolve audio here. So, those of
21 you that are online, our apologies, but we are
22 doing our best here to try and provide both audio

1 and visual.

2 (Pause.)

3 MR. KENNEDY: All right. Sorry for
4 all the confusion and delay here.

5 So, I'm assuming Ashley introduced me,
6 David Kennedy, I've got a title slide there, for
7 the administrator Kathy Sullivan and talk about
8 what's going on in the Arctic.

9 I started about May of last year
10 working on Arctic issues before I retired, but
11 I'm now back in a position just working on the
12 Arctic.

13 And in the last year there's been a
14 tremendous amount of activity around the Arctic.
15 And that activity doesn't even begin to address
16 the fact that the Arctic is warming faster than
17 anyplace else in the world right now.

18 There is sea ice loss and many, many
19 dramatic changes that are creating kind of a
20 whole new environment there that is setting off a
21 number of discussions, debates, executive orders,
22 Arctic councils and you name it.

1 I'll talk about some of those at the
2 end of this presentation, but NOAA has been
3 active and involved in the Arctic for a long time
4 and we have significant investments and we have
5 had.

6 We've had a National Strategy, a NOAA
7 Arctic strategy for some time, but as the
8 National Strategy began to be developed just as I
9 was coming onboard last year, NOAA developed an
10 implementation plan.

11 So, I'm going to very quickly -- and
12 I know we're already behind time. So, I'm going
13 to go through these very quickly, but what I want
14 to show here; one, is the breadth and depth of
15 the involvement of NOAA, but; two, how we and
16 what we are doing within NOAA matches up with the
17 National Strategy.

18 So, next slide if you're not there.
19 So, what you see on this next slide is basically
20 the National Strategy on the left hand side.

21 There's three lines of effort, as
22 they're called, from security to stewardship to

1 international.

2 And what we have done is taken the
3 NOAA strategy and aligned our goals and
4 objectives with that strategy.

5 So, basically you'll see then for each
6 of the three lines of effort where NOAA and its
7 goals are aligned.

8 So, as you'll also see here,
9 stewardship is primarily of the three national
10 lines of effort where the majority of NOAA's work
11 is.

12 Some of the categorization that we've
13 done here is a little bit random and you can put
14 some of what we do where we have stewardship in
15 security or international and vice versa. So,
16 we've done the best we can.

17 Next slide, please. So, as we have
18 put together our strategy and tried to align it,
19 we've done a couple of different cuts at looking
20 at how NOAA is invested.

21 So, in this first slide you'll see on
22 the outer ring again the lines of effort, the

1 National Strategy. And then kind of by major
2 category where that effort falls within the lines
3 of effort.

4 And, again, you see that the majority
5 of our effort is really in stewardship and
6 management, in part, because of the definition of
7 the Arctic.

8 The Arctic, the formal Arctic
9 definition actually is a line that runs through
10 the Aleutian Islands and then north.

11 So, when you think of the Arctic,
12 quite often you think of the Beaufort and Chukchi
13 Seas, but in this case the Bering Sea is
14 included. And NOAA for a long time has had a
15 significant investment in fishery and Bering Sea
16 fisheries.

17 Those are huge fisheries and National
18 Marine Fisheries Service has been there doing
19 fish surveys and a variety of other things for a
20 long time. So, that skewed some of these numbers
21 a little bit.

22 Next slide, please. So, we've taken

1 another cut in this next slide by geography of
2 where our investments lie. And it gets a little
3 bit more balanced, but, again, you still see that
4 the Bering Sea and the large marine ecosystems of
5 the Bering Sea are where a lot of our investment
6 is as I was speaking to before. Lesser amounts
7 in then the other divisions of the Arctic.

8 Next slide, please. So, just quickly
9 we really covered this in the first slide. And
10 in the interest of time and maybe to allow you
11 questions, I'm going to go through these next
12 ones very quickly. But, again, it kind of
13 reinforces the National Strategy and then where
14 NOAA falls underneath.

15 Under security there is a term that's
16 used a lot right now called "the domain
17 awareness." A significant amount of interest
18 within security of domain awareness.

19 The Arctic is a big place. We're not
20 well structured. We don't have infrastructure.
21 We don't have maybe as much monitoring and
22 intelligence ability as we would like and one of

1 the things that NOAA has been doing is kind of
2 saying that we are part of the environmental
3 domain awareness.

4 So, we're the backbone of that, a lot
5 of the environmental data that is used for some
6 of that domain awareness discussion.

7 Next slide. Again, I'm not going to
8 spend any time here. I've already talked about
9 the fact that stewardship is where an awful lot
10 of our activity lies.

11 And you can see under pursue
12 responsible region stewardship a variety of
13 things. We kind of give you a better flavor of
14 the investments that we're making under
15 stewardship.

16 Next slide, please. And then under
17 international, it's amazing the number of issues
18 that we have in the Arctic here that are picked
19 up and have been issues probably longer than they
20 have for us in other Arctic nations.

21 And we're involved and you see the
22 blend of acronyms here. Everything imaginable.

1 Both national and international and
2 intergovernmental organization seems to have some
3 role or responsibility in the Arctic.

4 One of the interesting side effects
5 that we're beginning to discuss and talk about a
6 lot more is that the Arctic is kind of something
7 that's put up on the shelf by much of the lower
8 48 as an issue that they don't really need to be
9 too interested in.

10 But what we are doing more and more is
11 seeing that a good deal of the change in the
12 Arctic has a potential to have significant
13 effects in the lower 48 in a variety of different
14 ways.

15 And so, there's a big move afoot to
16 try and get the lower 48 more engaged, interested
17 and aware of how significant the Arctic and its
18 issues are to the rest of the nation.

19 Next slide. One of the things that we
20 did -- that I was asked to do by Dr. Sullivan
21 when I came on is we have \$125 million investment
22 in the Arctic right now. And that covers a lot

1 of territory. We have six goals. All sorts of
2 different objectives underneath that.

3 And what Dr. Sullivan wanted was for
4 us to take a suite of things within our strategic
5 plan and try and come up with a couple or three
6 areas that we might highlight and really pursue
7 because they met a variety of criteria.

8 So, we put a workshop together which
9 we held in January in Seattle. And basically
10 what we did was say, okay, what are the main
11 drivers in the Arctic right now?

12 And so, when you see the identified
13 focused themes at the top of the next slide --
14 did I ask you to go there? If not, this is the
15 one that says NOAA Arctic Team Retreat, January
16 2015.

17 You'll see that we identified three
18 what we felt were significant drivers for change
19 in the Arctic and issues that were really kind of
20 national, international issues.

21 And what we did was say within those
22 three significant drivers, what is it that NOAA

1 does that probably is mainstream to either
2 helping advise, provide information or provide
3 help with decisions on each of the three; energy,
4 transportation and climate.

5 And we actually then over a two, two-
6 and-a-half-day workshop took everything that was
7 in our strategic plan and came up with three
8 areas that we have gotten back down to Dr.
9 Sullivan and said, with everything we do, here's
10 the three things that we're going to kind of
11 highlight. Here's the three things that we're
12 going to look at from potentially budget
13 initiative. And three things that, Dr. Sullivan,
14 as you talk about Arctic, we'd like to make sure
15 that you stress that are really important issues
16 that NOAA is stepping out on.

17 And so, you see improve weather and
18 sea ice forecasting. Again, that gets into that
19 environmental domain awareness arena, but kind of
20 a backbone baseline for so many things that go on
21 in the Arctic in certainly decisions that are
22 made.

1 The improve understanding of climate
2 impacts on biological resources, that kind of
3 draws in a good deal of immense work.

4 As most of you or some of you know, as
5 the climate changes, the ice leaves, the
6 temperatures warm. We're seeing migration of
7 species. We're looking at habitats and
8 ecosystems that we did not understand and have
9 not studied nearly as well as we wanted to before
10 and now they're in a state of flux and change.

11 And so, how, as the climate changes,
12 are we to keep up with understanding those
13 changes as they relate to all the biological
14 ecosystems from marine mammals to you name it.
15 And so, a major issue.

16 And it, too, affects so many decisions
17 whether it's energy exploration, shipping, you
18 name it.

19 And then finally navigation services.
20 You folks there, probably this is the one you
21 want to key in on. But in all of the meetings
22 that I go to about major issues in the Arctic,

1 there's always a discussion about how shipping is
2 going to continue to increase, how it's going to
3 become a significant economic driver and it's
4 also going to become a significant threat for a
5 variety of reasons, but always at the center of
6 those discussions is many parts of the Arctic
7 haven't been charted since the early days.

8 As we have more and more ship traffic,
9 we've got to do something to better understand,
10 keep ships from running aground or into each
11 other and have reliable routes that we can use to
12 get through the Bering Straits and up into the
13 Arctic.

14 So, those are the three areas we've
15 highlighted. There's a whole series of subtext
16 under each of those, but that's kind of where we
17 now are saying of everything that we do, these
18 are the two or three things we really want to
19 make sure that we highlight and focus on.

20 Next slide, please. So, finally I
21 mentioned that there is all sorts of new interest
22 in the Arctic. And since I have come on board we

1 have a National Strategy, we have a National
2 Implementation Plan, we have an Executive Order,
3 we have an Executive Arctic Team, we have Arctic
4 Council Chairmanship with a whole suite of
5 priorities that the United States has moved
6 forward as I take over the chairmanship.

7 And as you look at this sheet, this is
8 just to show you some of the day-to-day things
9 that we're involved with here and that we reach
10 out to the rest of NOAA to help engage and play
11 in a variety of committees, reports, data calls.

12 But what I have seen in the time that
13 I've been here is the interest just is
14 exponentially growing on the Arctic and
15 everything about it.

16 NOAA is a center line player and what
17 we're trying to do right now is make sure that we
18 stay right in the middle of all the play and to
19 the world make known that NOAA needs to be at the
20 table and that we bring an awful lot that's of
21 value to figuring out what the Arctic is all
22 about.

1 With that, I'll stop. And I don't
2 know, Ashley, if you have any idea of questions
3 or thoughts on that, but that's it for me and
4 thank you for your time. Sorry we got off to
5 such a slow start.

6 CHAIR PERKINS: I would say while we
7 have the line working and audio, let's utilize
8 that to our advantage and put our questions to
9 David while we have him.

10 Dr. Maune.

11 MEMBER MAUNE: Sir, you mentioned
12 improve understanding of climate impacts on
13 biological resources.

14 Are you talking offshore, or the land
15 areas?

16 MR. KENNEDY: It's similar in both,
17 but really this is an offshore focus. This is
18 the coastal and ocean focus.

19 MEMBER MAUNE: Okay.

20 MS. CHAPPELL: Any other questions for
21 Dave?

22 (No audible response.)

1 MS. CHAPPELL: All right, Dave. Thank
2 you so much. I think if you don't mind staying
3 on the line, we'll have you on there in case of
4 follow-up questions later.

5 Is that all right?

6 MR. KENNEDY: Okay. Fine.

7 MS. CHAPPELL: Thank you.

8 CHAIR PERKINS: Thank you, Mr.
9 Kennedy.

10 Lawson.

11 MEMBER BRIGHAM: Lawson Brigham,
12 University of Alaska, Fairbanks. Not emeritus
13 just yet. So, still hanging in there.

14 (Laughter.)

15 MEMBER BRIGHAM: I'm chair of the HSRP
16 Emerging Arctic Priorities Working Group. We've
17 been around for a couple years dealing with some
18 practical issues of employment of Coast Guard
19 vessels and emerging assets in the United States.

20 I have a presentation and some slides.
21 I would mention, though, that you may get the
22 wrong impression. And I'll bang on my soapbox

1 since I'm a member here. I can present you an
2 overview.

3 The United States is the largest
4 Arctic research and Antarctic research budget of
5 any country perhaps by ten.

6 United States operates nuclear
7 icebreakers in the Arctic Ocean, has domain and
8 control, I would say, of the Arctic Ocean.

9 The United States has a Presidential
10 Commission. The United States has large
11 fisheries well managed, well surveyed. I could
12 go on in a long list.

13 You hear all the time that the United
14 States is a piker in the Arctic. In fact, we
15 probably are the most advanced Arctic nation.

16 We have the most advanced military for
17 cold regions fighting, both bases in Alaska. We
18 have missiles in the ground and there's a long
19 list of things you don't hear about.

20 What is lacking in all of this,
21 development of the Alaska coastline and the
22 natural resources of Alaska and the

1 infrastructure to support that.

2 That's what all this hue and cry is
3 about. Where is the money from the federal
4 government, from my perspective, to support that?

5 Money from the federal government is
6 on all of these other things that make the United
7 States, I would argue, the leading Arctic
8 country. Not Russia, not Norway or whatever.
9 So, that's my perspective as a member of this
10 panel to tell you that there are different
11 perspectives here.

12 The emerging Arctic you see in the
13 pictures, I think Captain Rassello would be
14 interested in the ship on the lower right, is the
15 only non-icebreaking ship in the images there.

16 All these are world-class ships in
17 Russia, Russian nuclear icebreaker, Canadian
18 icebreaking Fednav ship, but the interloper in
19 the polar regions is the cruise ships both north
20 and south.

21 And how the international or global
22 maritime enterprise handles that and IMO handles

1 that and many of these ships of course carry
2 American passengers and how the Coast Guard
3 handles that, the safety network or the lack of
4 safety network.

5 Next slide. But I want to go back to
6 this National Strategy that David talked about.
7 And since I participated in some input into this,
8 this line of effort which speaks to Arctic
9 stewardship did address and singled out the only
10 infrastructure issue that's addressed in the
11 National Strategy and is called charting the
12 Arctic. So, to my mind for our group and our
13 argument, it is the highest priority.

14 I see ice forecasts, all kinds of
15 stuff that I enjoy and important investments, but
16 this, to me, is NOAA's highest priority because
17 it relates to the highest priority in the
18 National Strategy, my sense.

19 And when we run our workshop and
20 working group, maybe we'll come to this
21 conclusion. And so, you can see what it talks
22 about. Charting.

1 The reason it's there, the Coast Guard
2 officer who is at the National Security Council
3 that wrote this document for the president, lots
4 of input from agencies, lots of input from other
5 stakeholders, I was one of the stakeholders, and
6 they asked us what the infrastructure missing
7 was.

8 We all said, all of us mariners said
9 hydrography and charting first order. Highest
10 order of issue. For safety, network and
11 whatever, that's the highest order thing.

12 Don't need icebreakers. Don't need
13 survey ships -- well, we need survey ships to do
14 the surveying, but there are lots of
15 infrastructure that's needed, but primary is
16 charting America's Arctic.

17 Next slide. And so, in January 2014
18 this implementation plan was developed
19 interagency. A look, again, headed by the
20 National Security Council and the folks in the
21 White House, but they -- who's got the lead in
22 all of these themes and all of these important

1 lines of importance?

2 And so, of course you have the lead in
3 NOAA, but supporting a whole range of
4 organizations, but I thought what is interesting
5 are all the bullets that are teased out.

6 And like the one complete acquisition
7 of U.S. Arctic -- let me go back.

8 The National Strategy wasn't precise
9 enough. Didn't need to be, but this is the
10 implementation plan. So, what do we need?

11 We certainly need a lot of elevation
12 data and geoid model development. And we need
13 water level gauge and we need all of this stuff
14 besides the charting to -- and then what was very
15 interesting in it, the implementation plan teased
16 out these percentage, asked for what are these
17 percentage increases and what's to be charted and
18 what's the potential of deep draft port? How
19 much do we need to survey to these, whatever
20 these ports might be? So, anyway, I think
21 there's more precision in the implementation
22 plan.

1 Next slide. And then this is my
2 cartoon, but over many years of working on these
3 issues it's very interesting at the beginning of
4 the 21st century that the whole of the Arctic has
5 been traversed by surface ships in the
6 summertime.

7 The map would have no traversing of
8 the Arctic Ocean in the wintertime. A few ships
9 to Svalbard and Greenland. A few ships into the
10 western part of the northern sea route in the
11 Russian Arctic, but we see lots of different
12 sectors, lots of exploration.

13 The exploration is really related to
14 the adjudication of the claims beyond 200
15 nautical miles in the Arctic Ocean by the Arctic
16 coastal states, Arctic Ocean coastal states.

17 So, there have been actually a lot of
18 ships in the Arctic Ocean doing all sorts of
19 activities. Cruise ships in the summer, et
20 cetera.

21 Next slide. I did mention at lunch
22 this IMO Polar Code. The International Maritime

1 Organization in London has for now more than two
2 decades, approaching a quarter of a century,
3 developed a mandatory polar code to be rolled out
4 to the world in May to be mandatory by 1 January
5 2017.

6 So, the United States being an Arctic
7 country and polar interest and a maritime state
8 will be implementing through the Coast Guard,
9 Code of Federal Regulations, a Polar Code for the
10 U.S. maritime Arctic.

11 United States is one of the few
12 countries that doesn't have any special Arctic-
13 specific rules and regulations for its Arctic.
14 We will have with this international mandatory
15 polar code.

16 The next slide. This is the area of
17 the application of the code. And in the Bering
18 Sea, the southern -- the northern area or
19 southern area of the Polar Code application is 60
20 north. So, that's been maintained since the
21 evolution of the code.

22 And then you can see there's a zigzag

1 pattern across the North Atlantic to take into
2 account the North Atlantic drift and the Gulf
3 Stream and the warming of that part of the world.
4 And so, it isn't as easy as applying the Polar
5 Code to the Antarctic which is 60 south all the
6 way around the continent.

7 Next slide. This Polar Code will even
8 impact -- although it doesn't apply to government
9 ships, in the longer haul government vessels will
10 have to comply or be advised to comply with the
11 Polar code in the future.

12 SOLAS is the Safety of Life at Sea
13 convention. STCW is the Standards of Training,
14 Certification and Watchkeeping conventions and
15 the IMO, all agreed to by the United States and
16 the other maritime states.

17 We're amending SOLAS and STCW and IMO,
18 improving the structural standards of ships
19 operating in polar regions, more safety gear
20 apply to polar regions. Training and expertise
21 in the pilot house is probably the number one --
22 the human dimensions are the number one issue.

1 All ships sailing in the polar
2 regions, both north and south, will be required
3 to have a polar ship certificate issued by the
4 coastal state or, in fact, the classification
5 society.

6 And each ship, individual ship, ship
7 special will be required to have a polar waters
8 operational manual.

9 Next. On the environmental side,
10 MARPOL, the Maritime Pollution convention, will -
11 - we are amending in the IMO Polar Code these
12 annexes, zero discharge of oil, that makes some
13 sense, noxious liquids, sewage and garbage, but
14 not all issues in the environment are covered
15 like black carbon, the ballast water issues are
16 handled in another convention.

17 But nonetheless this polar code is a
18 seminal new regime for the Arctic which is
19 applied. And so, the IMO is not necessarily
20 ahead of the game, but at least keeping up with
21 the flow of the traffic.

22 Next. I've handed out to you all a

1 couple copies of a recent report that gives an
2 Alaskan perspective on the new maritime Arctic.

3 In the very recent beginning of the
4 year, we had an international workshop with
5 Norwegians and Russian involvement in Anchorage.
6 And then the sections of the report about sea ice
7 and whatever, I'll show you a couple findings in
8 a second here.

9 Next slide. Sorry for all the words,
10 but what we found in this couple-year study is
11 that its natural resource development is the
12 primary driver of marine transportation not only
13 in Alaska, but throughout the whole of the
14 Arctic.

15 This is consistent with the Arctic
16 Council's Arctic Marine Shipping Assessment, this
17 AMSA.

18 The shipping routes in the Arctic as
19 we heard in New York, the great presentation by
20 the silk maritime highway we heard about, the
21 Arctic routes are supplemental to whatever routes
22 we have today. They are unlikely, highly

1 unlikely to revolutionize global trade.

2 The whole application of the Arctic is
3 taking natural resources out of the Arctic to
4 global markets however the commodities go in the
5 next decades ahead.

6 So, all the shipping, bulk carriers,
7 LNG carriers, oil tankers, that's what we see,
8 which in many respects might be more higher risk
9 vessels than the container ships, but we're not
10 going to retool and rejig the container vessels.

11 As Steve Carmel always told us, that's
12 not his business in the Arctic, but there are
13 great opportunities. And the great opportunities
14 are for economic development of the Arctic and
15 taking the resources to the world.

16 There is a relationship of the
17 National Strategy to the AMSA and the
18 recommendations. I've told you about the IMO
19 Polar Code.

20 And I mentioned earlier today that
21 minimum extent of sea ice -- the maximum extent
22 of sea ice in the winter in the Bering Sea hasn't

1 really changed for five decades.

2 The next slide. But the minimum in
3 the summertime is reaching out into the central
4 Arctic Ocean. So, it's likely that there will be
5 longer seasons of navigation in the autumn and in
6 the fall, but not in the spring.

7 Highly seasonable marine traffic, and
8 I'll show you a slide here in a second, but
9 really it's offshore hydrocarbon development that
10 is the driver of the United States maritime
11 Arctic in the future, marine operations.

12 There are plausible looks at this
13 development. Could be a hundred support vessels,
14 eight platforms in the Chukchi Sea if they find
15 oil by 2025. And so, that's the traffic we're
16 talking about. And of course the final point is
17 hugely important.

18 Next slide. That's the traffic for
19 the United States maritime Arctic in 2013. It's
20 identical for the last decade and a half back.
21 And even for 2014 and 2015.

22 No traffic in the United States

1 maritime Arctic. No traffic in the Russian
2 Arctic. No traffic in the Canadian Arctic.
3 There's no traffic in this part of the world in
4 the wintertime.

5 Next slide. But in the summer, in
6 this case June, late May, June through November,
7 all kinds of traffic. Tankers into -- cargo
8 ships into the Red Dog Mine, which is on the
9 coast of the Chukchi Sea.

10 You can see most of the traffic on the
11 United States side is tugs and barges, towing and
12 supporting coastal communities, but that traffic
13 will also be with offshore development,
14 supporting the offshore oil and gas industry.

15 On the Russian side, though, we see
16 along the northern sea route on the left,
17 tankers, cargo ships, larger vessels which are
18 using the northern sea route in the summertime as
19 a supplemental trade route.

20 Next slide. A couple more findings.
21 Arctic port, number of studies looked at, we
22 looked at them in our working group, point all to

1 Nome as the real port of opportunity, but no port
2 should be built in Alaska, I would say, a member
3 of the study groups, unless it's tied to Arctic
4 natural resource development and the development
5 of Arctic -- Alaska's offshore and onshore
6 resources to export out of whatever this port is
7 to global markets.

8 The port is not the Port of Newark or
9 the Port of LA or Long Beach or I hear people
10 speculating about having a container port in
11 Adak. I mean, that's the relationship for the
12 port and the development whether it be
13 public/private partnerships, international
14 investment is related to shipping Alaska's Arctic
15 natural resources to global markets in this
16 century.

17 Seasonal increase along the northern
18 sea route and the Russian Arctic clearly will
19 happen in the decade ahead, but there are no
20 indicators that the northwest passage has any
21 viability as a global trade route in the decades
22 ahead.

1 What has viability is, again, the
2 carriage of natural resources in the Canadian
3 Arctic out of that area of the world to global
4 markets.

5 And then finally, the infrastructure
6 needs, as I have mentioned many times, are huge
7 in the United States maritime Arctic. Observing
8 networks, domain awareness, enhancement,
9 deepwater port, lack of SAR and environmental
10 response, coastal icebreaking capability and
11 maybe some defined Arctic corridors,
12 transportation corridors which relate to our
13 hydrographic needs.

14 One more slide and I'll finish. This
15 report which I've, I think, briefed several times
16 at the HSRP, is still a seminal report of the
17 Arctic Council.

18 And the Arctic Council and the Arctic
19 states are still working down the 17 major
20 recommendations from this report.

21 And of course the United States
22 approved this -- agreed to this report,

1 negotiated consensus recommendations. And so, we
2 have a baseline international report which the
3 United States has been using for -- one more
4 slide -- to speak to these issues; maritime
5 infrastructure, safety issues at IMO, and then
6 the general issues of protecting people in the
7 place, which are a full range of issues. And
8 I'll end there. Thank you.

9 MS. CHAPPELL: Lawson, do you want to
10 take questions now?

11 MR. BRIGHAM: Sure. Yeah, I mean,
12 we'll use a lot of this information for our
13 working group discussions and try to answer these
14 very specific questions that the admiral has
15 passed to us.

16 CHAIR PERKINS: Great. Thank you,
17 Lawson.

18 (Pause.)

19 MS. CHAPPELL: Admiral Glang.

20 RADM GLANG: It's working. I can
21 operate the clicker. All right. Good afternoon.
22 I'm Gerd Glang, Director for the Office of Coast

1 Survey.

2 This presentation I think, Dave,
3 you've seen in an earlier version. It was
4 presented at the U.S. Hydrographic conference
5 last month at National Harbor by our team of
6 authors, which was a combination from NOAA Office
7 of Coast Survey, as well as the Canadian
8 Hydrographic Service.

9 So, this paper is about coming up with
10 a risk-based methodology to assess the adequacy
11 of our charts in the Arctic region.

12 A little bit of background. Under the
13 International Hydrographic Organization we have
14 regional bodies. The newest of those is the
15 Arctic Regional Hydrographic Commission.

16 The ARHC, as I'll call them, consists
17 of the five primary Arctic nations; Russia, U.S.,
18 Canada, Denmark and Norway. We have two observer
19 members; Iceland and Finland.

20 And so, part of our strategy of
21 getting the ARHC to -- keep in mind this is an
22 international collaboration of -- having the ARHC

1 and our collaboration of the five nations be
2 productive was to engage the Arctic Council
3 recognizing that the last two years Canada has
4 chaired the Arctic Council, that in the coming
5 year the U.S. will take on the chair of the
6 Arctic Council.

7 We want the Arctic Council to
8 recognize the IHO as the competent body for all
9 issues that have to do with hydrography and
10 charting and safe navigation of the Arctic.

11 So, we've worked through especially
12 here in the U.S. our connections with PAME, which
13 is a standing working group under the Arctic
14 Council. PAME is the Protection of the Arctic
15 Marine Environment.

16 As Kennedy mentioned earlier, for the
17 purpose of our study we also used the U.S. Arctic
18 Research and Policy Act boundaries which extends
19 down to the Aleutians. And so, you can see it's
20 kind of a modified circle there.

21 And so, the question is, isn't the
22 Arctic already charted? So, most of us here are

1 aware that, okay, so maybe if you look on the
2 left in the small scale, we do seem to have
3 plenty of charts for most navigational
4 circumstances. The problem is they're very small
5 scale. So, they cover a very large area.

6 And on the right, though, you can see
7 a much reduced set of large scale or charts that
8 only focus in on a very small area. And those
9 are sort of in the coastal and harbor scale
10 charts.

11 So, not a whole lot in the large scale
12 portfolio, but the second question isn't
13 necessarily how well or how many charts there are
14 or how much chart coverage do we have. It's
15 really what's inside the chart, the information
16 that counts. And that's what we're trying to get
17 at in this study.

18 So, this methodology -- and, again,
19 keep in mind this was a collaboration of
20 primarily the four members of the ARHC.

21 We're not able to get a lot of input
22 from Russia, and that's something we continue to

1 work on, but it's basically a five-step process.
2 So, first we're going to look at -- this is the
3 word chart. It's easier than the next chart.

4 So, we want to look at what's our
5 confidence of our present hydrographic holdings?
6 We're going to separate the ocean into general
7 bands of depth. And we'll factor in something --
8 some general notion about complexity. Then we'll
9 do a little GIS analysis to develop where we have
10 concerns, and then we also brought in historic
11 traffic patterns. That's the beauty of having
12 AIS data and doing this kind of analysis in the
13 GIS.

14 And then we'll do some statistics and
15 I'll show you how that's guiding through the
16 United States our decisions on where we're going
17 to survey.

18 So, here's the eye chart. This is the
19 -- you know, we've got engineers doing this
20 stuff. So, here's a beautiful flow chart they're
21 very proud of.

22 There's a companion paper to this

1 presentation that walks you through this, but let
2 me start with the base data that we assumed was
3 available.

4 You'll see that around the U.S. and
5 Canada and Greenland and Norway this white cross-
6 hatched area, and that represents in a GIS space
7 the hydrographic data holding, but then you'll
8 also see underneath it a base layer of a gridded
9 model of the seafloor.

10 And that data comes to us from the
11 GBCO effort, which is the General Bathymetric
12 Chart of the Oceans. Specifically their effort
13 for the International Bathymetric Chart of the
14 Arctic Ocean.

15 So, that's a generalized bathymetry
16 model which is of tremendous value in the science
17 community, but what we're using it here for is to
18 provide us a little bit more information about
19 what the depths of the water are, the bathymetry
20 in places where maybe we don't have hydrographic
21 data.

22 One of the shortcomings of the

1 bathymetric data set is it's not going to get you
2 right up to the shoreline. That wasn't its
3 intent. So, there is a bit of ambiguity in the
4 nearshore regions, but we do have in many places
5 hydrographic data.

6 So just a little bit note about how we
7 define our confidence in our hydrographic data
8 and the short story is this has to do with the
9 technology. If it was older data acquired with
10 single-beam technology or there's also a
11 positioning equipment factor in here, then we're
12 going to just put it into a different -- a lower
13 category of confidence. If it's a modern,
14 multibeam sonar kind of a survey with GPS
15 control, we'll categorize it as higher
16 confidence.

17 And then on the far right there's a
18 category you don't see in the lower 48, which is
19 unassessed.

20 So, here's the geospatial display of
21 how that confidence of hydrographic data looks
22 for the U.S. So we've zoomed in. There's a

1 green postage stamp towards the left you'll see
2 next to the Diomedes, and that's the product of
3 recent surveys by NOAA.

4 And then if you follow the gray
5 embayment center right, that's Kotzebue Sound,
6 and you'll see a big green swath in there. And
7 that's the NOAA ship Fairweather survey data from
8 2012.

9 So we looked at the confidence or the
10 age of our data and we binned it into four
11 categories: high, medium, low and unassessed.

12 So I want you to take note of in
13 particular the gray area around Kotzebue Sound.
14 And you can also look at the Bering Straits there
15 where that green postage stamp is and the
16 Diomedes and Point Barrow because we're going to
17 -- as we walk through this analysis, you'll see
18 how this evolves.

19 PARTICIPANT: Can you point to
20 Kotzebue, please?

21 RADM GLANG: Oh, sure.

22 PARTICIPANT: For those of us without

1 geography.

2 RADM GLANG: In here.

3 PARTICIPANT: Great. Thank you.

4 RADM GLANG: So, that's that green
5 piece where the approach is to Kotzebue. There's
6 the Diomedes. I tried to verbalize this because
7 I don't have a remote pointer.

8 MEMBER ATKINSON: Excuse me. Is Nome
9 on there?

10 RADM GLANG: Nome is -- is it still on
11 here, or is it below here? Down here, Lawson,
12 right? Nome.

13 MEMBER BRIGHAM: Right in there.

14 RADM GLANG: Right in there. It's
15 been a few years since I've been there.

16 MEMBER BRIGHAM: Southern tip of the
17 peninsula.

18 RADM GLANG: All right. So the second
19 step is --- if you'll recall that cross-hatched
20 area were the areas of our --- of each member
21 state's hydrographic data holdings and these also
22 --- the boundaries of which corresponded to our

1 respective member state's territorial regions.

2 We tried to stay out of the
3 ambiguities of coastal state --- of member state
4 boundaries, but we just did a real simple check.
5 Where do we think the seafloor is simple? And
6 it's a very generalized -- I'm using air quotes -
7 -- description, and where is it more complex?

8 And so our hydrographers from each of
9 the member states sort of did a quick, well,
10 it's, you know, based on the geology and what we
11 know from our surveys in these areas, we're going
12 to call this place complex. And based on what we
13 know -- for instance, of Bering Strait, we'll
14 just classify that as simple seafloor. So, very,
15 very simple. Didn't want to make it too
16 complicated initially.

17 So here we have taken the depth and
18 the seafloor complexity and just separated it
19 into three color bands very simply, and you can
20 see the criteria that we used for the U.S. I
21 think some of the other countries did not use the
22 20 meter margin. I think they went straight to

1 the 50 meter margin. They were more
2 conservative.

3 So then you intersect your confidence
4 in your hydrographic data with those three depth
5 bands and we generate five areas of concern or
6 five levels of concern.

7 So I ask you to remember Kotzebue
8 Sound, which was unassessed, but it's also
9 shallow. And therefore, in this scheme comes up
10 as an area of highest concern.

11 And then we've got areas over here in
12 Bering Strait where it's somewhat deeper. Even
13 though the data is older or we have less
14 confidence in it, we have less concern because it
15 is slightly deeper based on the 20, 50, 100 meter
16 banding.

17 So that's just a real simple
18 intersection you can do in a GIS query. Shown
19 thusly -- we had a mathematician do this. So you
20 can see how the intersection of confidence with
21 depths gives us this color code, and then you
22 generate these -- start generating these complex

1 matrix tables of colors. So green is good. Red
2 is not so good.

3 So, the next step is to actually -- I
4 think I'm going the right way here -- actually
5 incorporate some vessel traffic. So, this is
6 Step 4. And, again, what we're looking for is to
7 inform us where do we need to survey next? What
8 should our priorities be?

9 And the AIS data we used was for the
10 year -- mid-2012 to 2013, I think. It's like one
11 year's worth of data, but what's interesting to
12 note is you see these tracklines going down into
13 these unassessed areas. This wouldn't otherwise
14 have appeared as a priority for us to survey.

15 Lots of traffic up through the Bering
16 Strait with, you know, sort of mixed confidence
17 in there, but we -- you can go one step further
18 now and stencil it out and say, what is the
19 confidence of the survey data where these vessels
20 have actually navigated. And now, we can start
21 seeing that the actual percentage areas for low
22 and none for where they're traveling starts to

1 become more of a concern.

2 Here's the polar view looking down.
3 So you can kind of see the aggregate of all the
4 four member states for whom we had -- we chose to
5 use their data, and here's with the tracklines
6 sort of stenciled out.

7 And then we start doing some analyses
8 and looking at Arctic-wide metrics. I'm not
9 going to go into the numbers a whole lot, but
10 you'll see Arctic-wide 80 percent of the area we
11 would regard as either medium to unassessed
12 confidence.

13 And then if you -- so, 20 percent is
14 probably okay, but really maybe it's better to
15 look at where are these vessels actually
16 operating, where their tracklines are?

17 Well, it looks like 23 percent of the
18 vessel tracklines for that period are actually
19 operating in areas where we have medium to
20 unassessed confidence levels in the chart data.
21 77 percent seems to be we have higher confidence.

22 So we're making some assumptions here,

1 but the first is that where we do have data,
2 hydrographic offices seem to have been informed
3 by where the vessels are going. The second is
4 that vessels are not navigating where their
5 confidence is higher in bathymetry. I think
6 those are a bit optimistic, those conclusions.

7 So let's focus in on just the United
8 States, kind of zip through this.

9 So it would appear that about 80
10 percent of the vessel traffic in that AIS data
11 batch was operating in areas where we had high to
12 low confidence. Only 20 percent was occurring in
13 areas that were of medium to low and unassessed
14 confidence.

15 So there are more statistics in here.
16 I don't have a lot of time. Like I said, there
17 is a paper, high confidence analysis. So, we can
18 use as the target where we want to survey based
19 on vessel traffic, how the area is used.

20 And so here you see for 2015 this is
21 how we developed our survey priorities, and if
22 you look at our survey plan were we to actually

1 get our full survey season underway, you'd see we
2 have Priority Number 1 is Kotzebue Sound. I
3 think Number 2 is Point Hope, and Number 3 was
4 Port Clarence. Just for this year, that has to
5 do with the availability of the ships.

6 And in our survey plan, you'll
7 actually see that we're going to have both the
8 Rainier and the Fairweather operate here in
9 Kotzebue Sound. We have a contractor that's
10 going to do some work up here off of Cape Prince
11 of Wales. And then the Rainier, if they have
12 time, will be operating at Point Hope. And the
13 Fairweather is assigned Port Clarence.

14 Yes, sir, Lawson.

15 MEMBER BRIGHAM: Yes, you can see Nome
16 is right to south of the word Legend, all those
17 blue lines into that point.

18 RADM GLANG: Oh, there it is.

19 MEMBER BRIGHAM: And that whole area
20 is surrounded by red.

21 RADM GLANG: So --

22 MEMBER BRIGHAM: So, I'm just saying

1 low -- that is the place where we might have a
2 deport -- a port in the future. And so, that
3 might get attention in the decade ahead.

4 RADM GLANG: Yes, I don't have a zoom
5 in. Actually, I had them go back and look at
6 this when it was announced that Nome was a port
7 of interest. And we have two surveys for the
8 approaches -- the immediate approaches to Nome
9 that are from 2005 and 2006.

10 So, we're not at a -- it's not
11 unassessed or unsurveyed, just that this scale of
12 what we're looking at, it's not going to show up.

13 MEMBER BRIGHAM: Could I mention one
14 more thing?

15 RADM GLANG: Sure.

16 MEMBER BRIGHAM: That surveyed in
17 2012, that box there.

18 RADM GLANG: Yes.

19 MEMBER BRIGHAM: That's the Red Dog
20 Mine complex where international vessels come
21 into offshore and load zinc and take it to global
22 markets.

1 And so all the blue lines from the
2 Bering Strait into that box there, surveyed in
3 2012, across that part of Kotzebue Sound is all -
4 -- looks gray to me and not red, so that the
5 transit areas of all the international ships are
6 crossing areas of what I interpret as somewhat
7 lower confidence even though it's not a -- it's a
8 simple seabed continental shelf.

9 RADM GLANG: So let's talk about the
10 one other piece --- yes, there we go. The
11 transit corridor.

12 So this is the transit corridor that's
13 under -- through the Federal Register notice
14 process, that Coast Guard has published for
15 public comment. Those are the words I was
16 looking for.

17 And we have worked with the Coast
18 Guard generating graphical images for them to
19 communicate, but what we've -- what we're doing
20 now is teaming with the Coast Guard and we've
21 planned out -- to start addressing the adequacy
22 of the charts in this transit corridor, is we've

1 developed this network of tracklines.

2 So that the vessels, the Rainier, the
3 Fairweather and the Coast Guard Cutter Healy as
4 they transit to and from their operating grounds
5 up north, are assigned these lines so that they
6 can acquire bathymetry along their trackline.
7 All the vessels have the systems to do this.

8 We're relaxing our standards here.
9 It's trackline bathymetry. It's not hydrographic
10 surveying, but we've done this before. It's
11 better than reconnaissance. It's not quite fully
12 controlled hydrography, but we think that will be
13 really valuable for helping us assess the
14 adequacy of the charts.

15 And as Lawson mentioned, we do regard
16 this as simple in the sort of bottom topography
17 sense. But if we find something, we certainly
18 have the ability to swing back and further
19 develop it, but this will be a way to get a quick
20 assessment in the shortest amount of time on that
21 route.

22 And I should emphasize that this is

1 sort of a -- one of our developing Integrated
2 Ocean Coastal Mapping success stories. So we're
3 really pleased. The key there is good
4 communications. Good partnerships, and we have a
5 longstanding relationship with the Coast Guard up
6 there.

7 So just a couple of caveats. I'll let
8 you read those. AIS is just for one year and --
9 right, so we're looking at past navigation
10 trends.

11 So if there's a new area of interest
12 or a new place where resource extraction takes
13 place -- and Canada, as an example, is looking
14 ahead for where that might happen. Then your
15 requirements are going to change.

16 But the beauty is we've put this all
17 into a GIS, so we can make it as complicated as
18 we want. We can add more bands of depths and
19 bands of complexities. We can put in resurvey
20 requirements for places where we know there's
21 active shoaling and sedimentation going on. So
22 having it all started in a GIS allows us to go

1 back and repeat the methodology.

2 And I think that's it. That concludes
3 this part of the --

4 MEMBER BRIGHAM: I should say that the
5 Alaska Marine Exchange --- like we saw with the
6 Marine Exchange is about -- I'm on the board. So
7 I know quite a bit about it.

8 It's a hundred transponders that are
9 spread around the coast from St. Lawrence Island
10 all the way up to Barrow and around the whole of
11 Alaska, even the panhandle. And so, we have AIS
12 receivers there.

13 Have very, very good maritime domain
14 awareness at least for commercial ships and ships
15 that are required by AIAA motor carry AIS. So
16 it's good traffic coverage. Not lots of ships
17 like here in LA, but enough.

18 RADM GLANG: Dr. Miller.

19 MEMBER MILLER: Just a quick question.
20 What's the traffic into Kotzebue Sound? I mean,
21 what's there?

22 MEMBER BRIGHAM: Well, a couple

1 tankers to support the community --

2 MEMBER MILLER: Okay.

3 MEMBER BRIGHAM: -- in the summertime.

4 MEMBER MILLER: Okay.

5 MEMBER BRIGHAM: It's not large

6 traffic.

7 MEMBER MILLER: All right.

8 MEMBER BRIGHAM: But larger ships.

9 CHAIR PERKINS: So the trackline
10 surveys that are being collected, what would it
11 take to get trackline data on more of those
12 vessels that we're tracking the AIS on? How do
13 we formulate a cooperative trackline survey
14 collection program from all of those vehicles in
15 transit?

16 RADM GLANG: The short answer is
17 resources. You know, we're leveraging the
18 systems that exist on the Rainier and
19 Fairweather, obviously with an experienced body
20 of survey technicians and hydrographers who can
21 operate those systems and pay attention to
22 collecting the data through any standard.

1 On the Healy, there is -- it's a much
2 smaller body of expertise, but they're willing to
3 collect the data. The other thing is the systems
4 are multibeam systems. So they actually cover a
5 wider swath.

6 So, there are -- if you could ask
7 other vessels of opportunity to log the data,
8 what would be involved? It's really building the
9 relationships, doing some systems checkout,
10 finding somebody who's willing to do this.

11 So maybe, Ashley, you want to take a
12 crack at this because I know we're sort of
13 gradually getting there, but we've got a long way
14 to go. You can't just pick up the phone and say
15 to the Kirby tug that's going up to Nome, hey,
16 turn on your echosound, or log the data. It's
17 just not that easy. It's the back-end piece.

18 MS. CHAPPELL: So this kind of picks
19 up on the crowdsourcing discussion you had
20 earlier, and we do have some things in the hopper
21 that we're looking forward to developing further.

22 Like we're using the Arctic as our

1 demonstration project for a trackline selection
2 tool. An online way for potential partners to
3 tell us about themselves and tell us where
4 they're going. Perhaps indicate, you know, their
5 route and what their capacity is for survey
6 whether it's -- you know, whatever it is, single
7 beam, that sort of thing. That hasn't been
8 developed yet. It's still in the idea stage, but
9 it will be worked on this summer.

10 The idea is as we build our trusted
11 partner relationships, we are finding out about
12 people/companies that are interested in doing
13 this with us and then sort of determining what
14 level of support they would need in order to
15 share that information with us.

16 CHAIR PERKINS: Admiral Barbor.

17 MEMBER BARBOR: Yes, are those
18 tracklines ellipsoidal referenced, or water level
19 referenced?

20 RADM GLANG: For the trackline plan
21 that I showed for the Bering Straits, that's just
22 regular waterline reference. It's just straight-

1 up, old school, you know, bathymetric tracklines.

2 CHAIR PERKINS: Okay. We have a
3 question from an online participant.

4 DR. MAYER: Hello. This is Larry up
5 in New Hampshire, and I think this has been a
6 wonderful study. I think it will be very helpful
7 in determining the highest priority survey areas.

8 What I have been concerned about,
9 particularly in the Arctic --- and it's something
10 that Admiral Glang mentioned at the very last end
11 of it are the temporal changes.

12 I think about our visits to Barrow
13 annually and watching the coastline absolutely
14 change, including the roads, wondering what's
15 happening offshore. And I wonder how we try to
16 capture those temporal changes.

17 And I am concerned that we -- by just
18 calling the seafloors simple, we may be ignoring
19 some areas that may actually be simple one time,
20 but not so simple the next.

21 RADM GLANG: Hi, Larry. It's Gerd.

22 So one idea I had is I've asked as the

1 two ships go work Kotzebue Sound, that they go do
2 reconnaissance work -- do some reconnaissance
3 lines back over the work they did in 2012. So, I
4 -- and then I've also asked them to do the same
5 thing when they get to Nome. There's some
6 imports planned in Nome where we had the 2006
7 survey.

8 So places where we have modern
9 coverage, where we can speak to the -- you know,
10 to what went into that survey more better where
11 we have the full bottom coverage.

12 If we as a practice start doing some
13 target lines of opportunity over that, just to
14 kind of assess the change, I think -- and I was
15 whispering to Andy earlier this morning, you
16 know, we also need to start looking at some of
17 these coastal processes and where this stuff is
18 going to help sort of cue us to where change is
19 happening more rapidly than in other places.

20 And where that change is happening, we
21 -- and it may also be affecting navigation.

22 DR. MAYER: Yes, I think that's

1 absolutely right. And I think we can start
2 putting into the model some effort to predict
3 where the change may be the greatest. It also
4 may be a place for satellite-derived bathymetry
5 once we have a good basis to look for changes.

6 RADM GLANG: So, I didn't even get
7 into Shachak's work up there. And I think I
8 talked about that in Charleston to this group,
9 but we did use satellite-derived bathymetry for
10 some analysis.

11 And Shachak wrote that great paper
12 that highlighted the shoal off of Barrow, which
13 by looking at a series of images and using the
14 pseudo-bathymetry, we actually showed it was
15 probably a real shoal.

16 And in fact, that's one of the reasons
17 that Point Hope survey was assigned was to go do
18 some recon over that shoal and kind of confirm
19 what we saw in the satellite-derived bathymetry,
20 but lots more room for doing more of that, for
21 sure.

22 DR. MAYER: Okay. Thanks.

1 MEMBER BRIGHAM: Lawson Brigham again.
2 This is why we should roll the Sikuliaq into this
3 whole process, a new polar research vessel of the
4 United States for UNOLS, has multibeam. Is the
5 most advanced Arctic research vessel on the
6 planet.

7 We need to roll that in -- that system
8 and UNOLS ship into this program. It shouldn't
9 be parochially used by the nation's science
10 community. It's a more national asset, I would
11 argue.

12 And so -- it has multibeams. So I
13 think that would be one working group issue to
14 help you, Ashley, maybe on this issue.

15 MS. CHAPPELL: I think I'd like Andy
16 to comment.

17 CHAIR PERKINS: This is about the
18 relationship with the Sikuliaq.

19 MEMBER ARMSTRONG: Yes, Andy
20 Armstrong. We -- at UNH we've been involved in
21 helping the Sikuliaq get the -- their multibeam
22 system commissioned and set up. And so, we do

1 have some interaction with them.

2 And I think that certainly one of the
3 things we want to pursue is keeping that
4 relationship going so that we can continue to get
5 good data from those good systems that are on
6 board.

7 RADM GLANG: Can I go back to the
8 crowdsource question?

9 CHAIR PERKINS: Yes.

10 RADM GLANG: So, this is Gerd Glang
11 from Coast Survey again. I'd like to go back to
12 the crowdsource question to make it clear where I
13 see Coast Survey's priorities are in enabling
14 crowdsourced or volunteered observed data.

15 So we've looked at this from different
16 directions sort of at -- earlier Jim Haussener
17 mentioned Reymarine. There are other system
18 providers out there who have created a closed
19 ecosystem for their users, their customers who
20 buy their equipment, to log their own data and
21 then improve their own charts. And you can go
22 out and find any number of vendors that do that.

1 Rather than us picking out a single
2 vendor, what we're trying to do is approach the
3 vendors in a broader sense and build those
4 relationships.

5 On the back-end where we are investing
6 time and effort -- and this is NOAA writ large,
7 is developing through the IHO a global
8 crowdsourced bathymetric database. And I think
9 I've mentioned this in Charleston, but we're
10 getting ready to enter Year 2 of that project and
11 they are basically building out the database --
12 the back-end if you will, to catch and manage
13 crowdsourced bathymetry, volunteered observations
14 for the whole globe.

15 At the front end, the IHO is working
16 on a pilot project with the Professional Yachting
17 Association to actually enable sort of the rules
18 of behavior -- the cookbook, if you will, of how
19 do you log the data, what kind of metadata do you
20 put into it.

21 And the next step here will be through
22 a body of the IHO to consider forming a working

1 group to actually bring in members of the
2 industry who do this kind of work, there's
3 different vendors out there, and try and build
4 some international standards on what crowdsourced
5 bathymetry might look like so that we can get it
6 into the archive, kind of put it into this big
7 data bucket. And I really think we got to have a
8 place to put all this kind of crowdsourced data,
9 because every member state needs to decide how
10 they want to use this data for their own.

11 For NOAA, for Coast Survey, we see
12 volunteered data, crowdsourced bathymetry serving
13 initially two purposes. And the first will be
14 there's probably value in that data -- in fact,
15 we know there is, in helping us inform and assess
16 the adequacy of our charts.

17 The second path is if you know enough
18 about the crowdsourced data, if you have a
19 network of trusted partners --- sort of trusted
20 volunteers who are providing data. That over
21 time, using concepts of some of the online games
22 where you accumulate points and can be assigned

1 confidence to your data and you get a lot of data
2 for the same place you can use statistics, you
3 may actually be able to take that volunteer data
4 and choose to put it directly onto the chart.

5 But that really needs to be up to the
6 individual hydrographic office because there may
7 be geographies where you really don't need that
8 information, that volunteered data. There may be
9 other geographies where you have nothing else and
10 really this is better than nothing. And so, you
11 might consider putting it directly to the chart,
12 but that all has to be discovered as we go.

13 And so I think our initial focus is
14 really on this priority of building the database
15 to at least collect the data and manage it and
16 steward it in an organized fashion.

17 So that's Coast Survey's position on
18 where we're going with crowdsourced bathymetry.

19 CHAIR PERKINS: Thank you for that
20 update. That's been a topic of reoccurring
21 interest. So that's very encouraging.

22 VICE CHAIR HANSON: I just have a few

1 questions on all the presentations.

2 First off --- and I'll go ahead and
3 ask these questions, and you guys can respond how
4 you feel, but there's other countries involved in
5 the overall program that you mentioned and I
6 notice their data seems to be all green -- mostly
7 green.

8 Do their surveys get done by a NOAA-
9 type government agency, or are they done by third
10 party? And I assume we assume that the standards
11 are NOAA standards. So are you comparing apples
12 and apples?

13 Two, it was great to see plans for
14 this year. Is there any plan scheduling done for
15 subsequent years to get the rest of the data that
16 we'd like to get?

17 And then third, I notice you have a
18 contract group working this year and I'm curious
19 how the production of the contracting survey
20 group you use compares to the production, i.e.,
21 lines run and cost compared to the NOAA vessels.

22 MS. CHAPPELL: That's a lot.

1 RADM GLANG: Okay. Thanks, Bill.

2 (Laughter.)

3 RADM GLANG: So, I think the first
4 question had to do with your --

5 VICE CHAIR HANSON: It's almost that
6 time.

7 RADM GLANG: We've got a ways to go
8 too.

9 So you were looking at one of the
10 charts and you noticed a lot of green in the
11 other countries.

12 VICE CHAIR HANSON: Yes, like their
13 surveys were all perfect.

14 RADM GLANG: So I think what you were
15 looking at was --- those were places where it was
16 deep, and therefore in this scheme where you're
17 using both depth and recency of data, if it's a
18 deeper area based on the IBCAO, the bathymetric
19 data, you have less concerns. So slightly higher
20 confidence. So, I think that was the green you
21 were seeing.

22 VICE CHAIR HANSON: Okay. And then

1 the evaluation of high confidence versus low
2 confidence, was that done by each country or by -
3 -- were you guys --

4 RADM GLANG: We let each country
5 choose how they want to do that.

6 So I think for the U.S. we use this
7 CATZOC code, which is a number that's actually
8 encoded into the electronic navigation chart. So
9 we've managed to populate all our ENCs with that
10 CATZOC code.

11 The other countries are not quite
12 there yet. They're still developing their ENCs -
13 - I'm losing track of the question I was
14 answering. Oh, the CATZOC.

15 So the other countries you saw in that
16 table way up in Slide 8 -- go back to Slide 8.
17 You can see the U.S. and Canada we used CATZOC.
18 Norway and Denmark used their equipment type
19 because they haven't fully populated that CATZOC
20 value in their electronic nautical charts,
21 navigational charts.

22 Okay. So your second question had to

1 do with our contractors?

2 VICE CHAIR HANSON: I was going to
3 save that for last.

4 RADM GLANG: Save that one for last.

5 VICE CHAIR HANSON: The second one was
6 really what's planned for 2016-2017.

7 RADM GLANG: So, the 2015 plan becomes
8 the 2016 plan.

9 VICE CHAIR HANSON: Okay.

10 RADM GLANG: Unless we actually get
11 things done this year. Yes, so they are looking
12 ahead. We certainly have other places planned.

13 Those survey areas we assign are much
14 larger than we anticipate them knocking out in
15 one year. So there are other areas we've got
16 assigned or are planned as we move ahead.

17 Using this methodology we have not yet
18 developed a new five-year plan, though. We've
19 got enough to keep us busy for three years.

20 VICE CHAIR HANSON: That's what I was
21 wondering is how this need impacts the other
22 needs you have.

1 RADM GLANG: So we can identify the
2 survey priorities. It's how much of that survey
3 --- or that area that you need to survey in a
4 particular year. That becomes the balancing act
5 between resources, right?

6 I can say I need to do the approaches
7 to Kotzebue and Kotzebue Sound, but how much of
8 that I get done in a particular year becomes a
9 fine balancing act of how many days at sea I get
10 assigned and how many contract dollars I want to
11 invest in surveying in the Arctic versus
12 someplace else.

13 VICE CHAIR HANSON: And so, that plays
14 too, then to the urgency and the need for the
15 data. And that kind of plays into our outreach,
16 you know.

17 If this has got to get done because
18 we've got a deadline, then that certainly impacts
19 our outreach message as opposed to, well, we'll
20 get to it when we get to it.

21 RADM GLANG: So, a good segue then ---
22 and we should probably wrap this session up. I

1 don't mean to cut you off, Bill.

2 VICE CHAIR HANSON: No that's okay.

3 RADM GLANG: So, in that tasking for
4 the Emerging Arctic Priorities Group, one of the
5 things I'm asking the panel on is for their views
6 on what kind of criteria should we consider for
7 how much I get done in a particular season in the
8 Arctic.

9 So I'm looking for input. How
10 important is the Arctic? So, you've heard
11 Kennedy say that it's a priority that if we look
12 at our base funds, there are monies being spent
13 in the Arctic, but we know there's not new money
14 coming to this. And so how much do we light our
15 hair on fire for this work in the Arctic?

16 CHAIR PERKINS: We have an online
17 question. And I know we've run over on this
18 session, but, you know, we've had so little
19 online input I want to allow a little additional
20 time to try and entertain it.

21 So the question comes from Timothy
22 Smith, and is anyone able to speak about managing

1 the lack of data in bathymetry on the river
2 systems that tug and barge folks use in support
3 of western Alaska, and what are the methods to
4 address the dynamic nature of the river systems
5 and how can it be approached from a charting
6 perspective?

7 Now the river systems may or may not
8 be the domain of this group. So I'm looking at
9 the panelists for an answer.

10 RADM GLANG: So I think if it's the
11 Timothy Smith I'm thinking of, he's actually our
12 navigation manager.

13 And just recently this question came
14 up from a tug operator. And the same operator --
15 the name of the company escapes me, also came to
16 our Anchorage HSRP meeting, if you will recall,
17 and they were making a pretty strong case --
18 making their point very strongly that we're not
19 paying attention to charting those rivers which
20 are extremely -- can be extremely tidal and would
21 definitely have very varying bathymetry.

22 So in the grand scheme of priorities,

1 that's one of the reasons we have these questions
2 going to the working group.

3 So there are different places in the
4 Arctic and in western Alaska that are important
5 for different reasons. How do we decide which is
6 more important?

7 And then I would just also offer that
8 technically those rivers would be a real
9 challenge, because you do need to establish water
10 levels.

11 I don't know if you want to talk to
12 that, Peter.

13 MR. STONE: Yes, I believe it was five
14 or six years ago we did the -- you guys did the
15 river up to Bethel, Alaska. And that was a very
16 challenging area to do tides in.

17 Part of the problem is, is that the
18 tide range is high and there's extensive
19 mudflats. So it was very challenging and kind of
20 gets back into using -- we can't use our
21 traditional water level gauges in those areas.
22 We have to get more expertise in using things

1 like bottom-mounted pressure gauges and the GPS-
2 type buoys in those areas.

3 CHAIR PERKINS: Lawson.

4 MEMBER BRIGHAM: Lawson Brigham. Yes,
5 this speaks to resiliency of communities economic
6 well-being, survivability of these communities.

7 So what's the priority compared to
8 Americans on the beach in communities, coastal
9 communities and offshore development?

10 CHAIR PERKINS: Great. And, Mr.
11 Smith, thank you for the question. My apology
12 for not recognizing your name. Alaska seems like
13 a long, long time ago after a few full days here
14 in this room.

15 MS. HOUSE: He also said Admiral Glang
16 is correct in relaying -- throwing out the
17 question for discussion. Vitus Marine was
18 original inquiry.

19 CHAIR PERKINS: All right. I think we
20 should end this session and try to get our --
21 onto the next session and our stakeholder panel
22 discussion.

1 We'll recess for no more than five
2 minutes, please. Thank you.

3 (Whereupon, the above-entitled matter
4 went off the record at 2:20 p.m. and resumed at
5 2:30 p.m.)

6 CHAIR PERKINS: All right. We'll try
7 to get reconvened and begin with our next session
8 on coastal resilience.

9 MS. CHAPPELL: Okay. So I just
10 thought -- this is Ashley Chappell, Integrated
11 Ocean and Coastal Mapping. I'm just going to
12 provide a little bit of context for this session,
13 this section of the agenda.

14 We have a focus on coastal resilience
15 and the idea is that this is -- it's not
16 something that this group has talked about a
17 whole lot, I think. And so, it will be a series
18 of presentations that will then lead into the
19 breakout session so that that breakout session on
20 resilience has a little more fodder for
21 discussion.

22 So, the order we're going to go will

1 be -- Audra Luscher is going to present first on
2 coastal resilience writ large, and then I will
3 present on where we are on some integrated ocean
4 and coastal mapping developments that relate to
5 coastal resilience, as well as intelligence, but
6 we'll have a resilience focus.

7 And then Mike Aslaksen will follow me
8 to give an update on where his program is with
9 some operational developments and advances and
10 their relationship to the resilience effort.

11 So if you think about this session not
12 as strictly an IOCM session, but more a coastal
13 resilience session, I think it will help the
14 breakouts later.

15 Let me introduce Audra Luscher. She
16 is recently, dare I say, co-opted by CO-OPS. She
17 was with the Office of Coastal Management, which
18 was formerly the Coastal Services Center, if you
19 need all the history on all the acronyms and
20 names. And she will start us off.

21 So, thank you, Audra, for being here.
22 Enjoy.

1 MS. LUSCHER-AISSAOUI: Thank you so
2 much for having me here. Again, Audra Luscher
3 with CO-OPS. I want to start with kind of
4 putting some context around how we got to the
5 term resilience in the whole frame of risk
6 management.

7 I joined in as a coastal manger
8 through North Carolina and Maryland coastal
9 programs. So I was working on the ground with a
10 lot of communities before I joined NOAA.

11 So I was one of those people that
12 were looking at the navigation portfolio and
13 wondering how can I use this to plan for sea
14 level rise. So I've been in that very specific
15 situation.

16 And so I think we're at the place
17 where now funding streams are opening up for this
18 kind of work. And what I want to try to
19 articulate today and talk about is the connection
20 between foundational information and what it
21 means to apply to coastal intelligence versus
22 coastal resilience.

1 And what I would like to show is it
2 really isn't that much different. And I want to
3 kind of explain what that means before we get
4 into our breakouts.

5 So I'd like to talk a little bit more
6 about that definition that Russell Callender
7 brought up and talk about what has happened with
8 the trends in coastal resilience, and then make
9 those connections between resilience and coastal
10 intelligence.

11 And then finally I just want to kind
12 of tee up a couple opportunities I think that I'd
13 like to kind of put out there for you guys to
14 think about where I see there's a lot of
15 opportunity to grow under the portfolio and
16 advocate for new resources and a new story around
17 foundational information.

18 So we've heard that resilience is, you
19 know, has the whole spectrum of planning,
20 preparing, the long-term planning perspective.
21 It's about responding to events as well. It
22 really is the whole entire spectrum of disaster

1 management. This is really a feedback loop.
2 This is really, when you think before the storm,
3 all the way during a storm and then back around.
4 It really is a feedback loop.

5 However, what changed was the whole
6 issue with climate change came into the picture
7 of risk management. And for politicians who
8 don't necessarily like to work around that
9 subject matter, resilience has provided a really
10 great framework to continue to talk about
11 changing conditions, future conditions, without
12 necessarily having to specifically tie it to that
13 concept of climate change.

14 So when you have things that happen
15 after a storm, that as a hazards manager, when I
16 first came into this, was the ultimate
17 opportunity to start again, to have that window
18 of opportunity. A lot of times we are pushing up
19 against walls when it's not in those what I
20 consider windows of opportunities.

21 Not that I wish storms to happen, but
22 events do happen and I think you need to be

1 prepared in those windows to be able to advocate
2 to make, not just putting the community back to
3 what it was, but how do you take that step
4 forward in changing the dynamic to make it more
5 resilient for each storm? So, it's this constant
6 loop of making these adaptations through this
7 cycle.

8 And, you know, we rely on that
9 National Academies' science definition, but I
10 think there's a number of ways -- FEMA defines it
11 in a much different context. And actually in the
12 last few years what happened with Katrina and
13 then what we went through with Sandy, we have a
14 new disaster recovery framework that was rolled
15 out in Sandy.

16 So things like ecosystems are able to
17 come into the picture in recovery now that wasn't
18 provided in storms past. And so these are some
19 of the things that are allowing us to kind of put
20 that resilience context into the picture of
21 management today, compared to what I would
22 consider risk management ten years ago.

1 So resilience is dynamic. Your
2 community can change its resiliency through
3 policies, through initiatives, through all sorts
4 of ways and it doesn't have to be a static
5 condition.

6 And just as we can make it more
7 resilient, things can also happen to make it less
8 resilient. If we take away infrastructure that
9 absorbs water during storm events, we are
10 fundamentally taking away our ability to deal
11 with some of the water load that happens in our
12 communities.

13 So when we make choices, we have to
14 understand that we're changing that spectra and
15 that dynamic of our resiliency. Now, with that
16 being in mind, how do we know how resilient we
17 are? We're really at that fundamental stage
18 where we don't know how to track resilience in a
19 community, in a port, based on fundamental
20 indicators.

21 So where we really are with the trends
22 around resilience is how do you set up consistent

1 and fundamental ways to assess where we are in
2 that spectrum to know if we are more socially
3 vulnerable, ecologically vulnerable? Do we have
4 enough funding that allows us to get through a
5 storm if we have, you know, enough of those
6 resources? So you're looking at it through those
7 perspectives. So, indicators are becoming a
8 very, very big part of the management framework
9 within coastal resilience.

10 I pretty much said a lot of this. So
11 let's talk about the importance of coastal
12 intelligence in the concept of resilience. You
13 know, communities really rely on authoritative
14 and reliable information. They rely on it just
15 like a navigation relies on authoritative
16 information, things that you can have actionable
17 information.

18 What I would say is different is the
19 time frames in which we make those decisions.
20 Most of the navigation-focused activities are
21 realtime. That same data and that same
22 information is applied, but we have to look at it

1 in different time horizons. So things for future
2 planning may be on a spectrum of ten to 25 years.
3 Same data used in different time horizons.

4 And so when you're looking at sea
5 level, this is what I would consider the crux of
6 the future change when it comes to what we're
7 dealing with under resilience.

8 Too much water or too little water is
9 really the fundamental issue that we're going to
10 have to address. Whether it be the drought issue
11 we heard about today, or whether it's too much
12 water during storms, or stormwater infrastructure
13 can't take away water in enough time and so our
14 infrastructure floods.

15 So you're really dealing with how that
16 change in sea level is interacting with the water
17 levels. And so on those different time horizons
18 we have really been looking at sea level from a
19 very long-term perspective. What is sea level
20 rise going to be in 2100?

21 I would say a lot of managers can't
22 make realtime decisions -- I mean more

1 authoritative decisions on something that's in
2 such a long-term time horizon.

3 So things that we've done is changed
4 our analysis with sea level -- instead of looking
5 at long-term means, and changing how we look at
6 it through every tidal cycle, every high tide.
7 And what we've seen is that sea level has
8 fundamentally changed how high our tide is rising
9 near our communities every day.

10 So you're getting this phenomena --
11 more understanding about what we call nuisance
12 flooding, recurrent flooding. This has
13 significant impacts on how commerce can go
14 because the roads can get affected on a daily
15 basis, your port infrastructure may be flooding
16 on a more regular basis. All of these things are
17 actually happening on a day-to-day basis instead
18 of this very, very long-term horizon.

19 So I think it's really important is to
20 know that we have a lot of ability to use the
21 infrastructure we're already collecting from a
22 navigation perspective to put it in the context

1 of resilience and to make that authoritative and
2 I would say decision support for this type of end
3 user.

4 So from my perspective, I don't think
5 they're competitive at all. I think that coastal
6 resilience isn't -- you can't be resilient unless
7 you're intelligent. If you're not informed and
8 you're not intelligent about your situations, you
9 can't adapt and become more resilient.

10 And so really coastal resilience is
11 about sitting on the shoulders of coastal
12 intelligence. It's just using that same
13 information in different time horizons and
14 different spectrums along this feedback loop of
15 disaster and putting in future conditions in
16 order to inform a new end user.

17 So, I feel like when all these new
18 funding streams are kind of hitting right now, we
19 have a really great new story to tell.

20 This is really still the story about
21 coastal intelligence and we have to weave these
22 stories together so that they don't seem

1 competitive, but we also have to think about, as
2 people who deal with navigation, what does that
3 mean for us as we step into the game of
4 resilience?

5 We've talked a lot about resilience
6 grants. I do not think that those do not include
7 the navigation community.

8 If anything, I think that ports should
9 be stepping up just as much as communities should
10 be to be going for these grants and looking at
11 the future condition picture. So, from my
12 perspective I think resilience funding has a
13 place to support this overall navigation group
14 and the marine transportation system as a whole.

15 So, I just wanted to talk a little bit
16 about, here's a product. When it comes to
17 resilience products, I feel like they're really
18 just a second order product of what was usually,
19 you know, what you may use in navigation is one
20 data point or a data stream and some static
21 plots.

22 In a resilience perspective, these

1 things need to be put on a landscape scale.

2 Visualization becomes more important.

3 But I'll also say is this is a
4 visualization for lake level. Lake level going
5 up, lake level going down. It's a companion to
6 the sea level rise viewer.

7 What you'll notice is that those white
8 areas are data gaps. When you start putting
9 navigational -- navigation information into
10 resilience products, it fundamentally highlights
11 those gaps very clearly.

12 And when you get an end user really
13 relying on this kind of information, what you
14 have is a new group advocating for the same
15 information because they're relying on that and
16 they need those gaps filled.

17 So, most of this topobathy that was
18 used to make this viewer came from navigation and
19 hydrologic service products, but they were
20 applied to this resilience context.

21 And so, I say again there's a real
22 story to advocate for more resources for this

1 foundational information to support coastal
2 resilience.

3 I also think that this is a great
4 opportunity to bring more partners into this
5 picture, because we may not be the only ones that
6 can service those nearshore areas.

7 I think IOOS has a lot of new
8 methodologies. There are a lot of technologies
9 that can adapt to make partnerships to fill these
10 gaps collectively. So, I think again resilience
11 brings in an ability to kind of leverage and
12 create new opportunities under the navigation
13 portfolio.

14 So, I say, you know, we probably --
15 this might fundamentally go against what people
16 think, but really if we didn't put another piece
17 of infrastructure in, another tide gauge, we
18 could still service resilience in a very strong
19 way just by kind of adapting the procedures that
20 we currently have at looking at our current data.

21 So, right now we have a whole host of
22 information in our ports, that's the ports with

1 the trademark. You have current data. You have
2 water level data. All these are taken on the
3 realtime perspective.

4 In some respects, they're kind of
5 being left on the cutting room floor for the
6 long-term perspective. Some of these ports have
7 been around for 19 port systems, have been around
8 for 19 years.

9 That's 19 years of long-term data.
10 That's 19 years that we could be using current
11 information pre- and post-tsunami events just by
12 changing the way we're surveying that data in
13 different cycles.

14 Instead of going for six-minute data
15 look in doing tides and currents, we could be
16 doing 15-second data in order to pick up that
17 signal after a tsunami event.

18 So, we really do have large
19 infrastructure investments that if we change the
20 way we analyze it, we could serve that community
21 in a much better way.

22 I also think we have a lot of

1 investments in our reference frame. We have
2 information that's telling us where we are.

3 You heard Juliana talk about, you
4 know, what they are doing to upgrade that
5 reference frame and provide, you know, our
6 positioning information.

7 But when you combine the cores with
8 the water level, you're looking at land changes.
9 You're looking at that reference system and using
10 it to look and measure that change.

11 It's incredibly important because
12 actually when we withdraw oil and we withdraw
13 water, we change that subsidence rate. And
14 that's a management decision.

15 We can very easily change that
16 decision in order to make us less susceptible to
17 coastal flooding, because we can pump water back
18 into our aquifers, we can do a whole host of
19 other things that may happen.

20 And people have started to do that,
21 because their subsidence rates are going so
22 quickly, are sinking so quickly.

1 And so, they've either decided not to
2 withdraw from their aquifers anymore, or they do
3 different management activities.

4 So, again, that reference frame is
5 actually very important in tracking coastal
6 change on land.

7 So, I think we've heard from already
8 a number of people that talked about, you know,
9 observations are critical to validate models in
10 mapping.

11 And I don't belabor this point,
12 because I think we've heard that a couple times,
13 but if we don't have the specific information
14 feeding into things that are putting information
15 into a broader geospatial scale and we're not
16 verifying that with observations, you know, we're
17 really discrediting the accuracy of those models
18 and being able to predict change.

19 And so, I think it's really important
20 that we're continuing to do this process. So,
21 observations and foundational information are
22 incredibly important for geospatial applications

1 as well.

2 You may have a specific -- this is an
3 NWLON. We're starting to look at change and
4 track it through alert spectrums when it hits a
5 certain threshold so you can start monitoring
6 that change on a daily basis, but you also need
7 to know how that lays out on the land so they can
8 visualize that.

9 And that's another part of using the
10 observations to depict and visualize change and
11 validate models and mapping products.

12 And finally I would say the last
13 opportunity is, again, I told you I think ports
14 and navigation communities can advocate for
15 resilience grants.

16 And I don't think you -- we have to go
17 too far away from the coast to start working in
18 our port systems to look at different ways that
19 they could become more resilient.

20 Specifically, I think that we don't
21 really have -- we have a lot of products that get
22 ships in and out on time, but we really haven't

1 looked at the intermodal transportation issues
2 that happen with rail and trucking lines.

3 When you have a disaster, that is the
4 number one thing that really keeps ports offline
5 for a long time is not so much of what's
6 happening in the port; it's what's happening with
7 the infrastructure outside the port.

8 So, this relationship of really
9 building products that are outlooks for water
10 level that help these industries understand what
11 the change is, understand how to make contingency
12 planning, will ultimately make the people and the
13 places in ports be able to become more resilient
14 in these perspectives.

15 So, I think things like seasonal
16 outlooks, things that we're talking about how
17 water levels will change and flood roads not even
18 during storm events, we're talking about this
19 nuisance flood issue because how sea level is
20 changing and, you know, people need to know that
21 in a time frame that management decisions can be
22 made in the perspective of a few months or weeks.

1 So, I just wanted to say this is
2 another opportunity where, you know, I think we
3 could get more engaged in pushing the whole look
4 through an outlook perspective.

5 So, I will leave it at that and I look
6 forward to the breakout, and I thank you for your
7 time.

8 (Applause.)

9 MS. LUSCHER-AISSAOUI: I didn't know
10 if we want to do questions now.

11 (No questions.)

12 MS. LUSCHER-AISSAOUI: Okay. Thank
13 you.

14 MS. CHAPPELL: All right. So, as I
15 said, I'm going to talk with you about where we
16 are on one of our integrated ocean and coastal
17 mapping commitments or one of our projects, and
18 then Mike will wrap up in a bit.

19 If you jump to the -- actually, I have
20 a slide changer up here. I'm glad to follow
21 Audra, actually, because then I don't have to
22 tell the whole story of resilience as I told

1 Audra earlier.

2 What I'm going to be talking with you
3 about is the interagency commitment on a national
4 coastal mapping strategy.

5 And one of the major reasons behind it
6 and one of the things that all of the different
7 agencies can get around is this concept of
8 resilience.

9 And so, this slide just is to
10 illustrate that, you know, we are seeing
11 increased frequency/intensity of storms, impacts
12 to our coast, sea level rise, increased
13 commercial traffic, larger ships.

14 Of course we always talk about those
15 sorts of things. And so, it's just a quick slide
16 to kind of summarize all of that and highlight
17 the areas where we need information, coastal
18 intelligence information for coastal resilience.

19 And resilience is in all of these
20 different facets that NOAA in particular is
21 focused on; safe and environmentally sound
22 navigation, being a weather-ready nation,

1 community livability, coastal community
2 resilience and resilience to hazards across the
3 board whether it's for communities or economies.

4 And when you look at all of these
5 things, I don't know what happened to my slide
6 here, but basically the message in this slide is
7 that all of these different -- seemingly
8 different activities really have one underlying
9 piece, which is the need for ocean and coastal
10 mapping data.

11 That's the bullet there that you can't
12 read. It's the most important one on the slide
13 that says they all need ocean and coastal mapping
14 data.

15 Just for those of you that are not
16 familiar with how IOCM is structured, first in
17 NOAA, we have 21 NOAA programs that we consider
18 part of our integrated ocean and coastal mapping
19 team. And we get together to talk about data
20 acquisition, data stewardship and maximum use and
21 reuse of data.

22 At the interagency level, we have very

1 much the same thing with the agencies that you
2 see here in the list. This was an interagency
3 effort that actually started, I think, in 2009 at
4 least -- actually, predated 2009, because that's
5 our Ocean and Coastal Mapping Integration Act
6 resulting initially from the National Academy of
7 Sciences study Geospatial Framework for the
8 Coastal Zone. So, we've been at this for a
9 while.

10 We co-chair the IWG-OCM, the
11 Interagency Working Group on Ocean and Coastal
12 Mapping, with USGS and Army Corps. So, NOAA,
13 Army Corps, USGS are the leads of it. And we are
14 charged with facilitating the coordination of
15 ocean and coastal mapping activities to avoid
16 duplication.

17 This was in 2009. As I said, we were
18 doing this before 2009, but then it got codified
19 in the Ocean and Coastal Mapping Integration Act.

20 And one of the things that act said to
21 do was develop an annually updated National Ocean
22 and Coastal Mapping plan. Well, that's easier

1 said than done.

2 Later with the National Ocean Policy,
3 that same charge came to us again in the form of
4 the Ocean Policy Implementation Plan. Kind of
5 called out in more specific detail by saying
6 develop an interagency plan for topographic and
7 bathymetric LIDAR particularly for -- this was in
8 the climate resilience component of the plan and
9 then repeated under the observations, mapping and
10 infrastructure piece of the plan. Kind of the
11 same task.

12 So, you know, a little bit of
13 redundancy in the plan, but it's kind of like a
14 smack in the head like let's get on with it.
15 We've told you three times to develop an
16 annually updated mapping plan.

17 And our interagency team of course has
18 been working on this the whole time, struggling
19 with it. How do we do it?

20 We started with an inventory. We
21 wanted to take an inventory of data. We
22 developed an inventory pilot. That became

1 somewhat obsolete in that, as we were developing
2 it, lots of data portals were sort of
3 proliferating on the landscape and kind of
4 overtook the need for a specific inventory,
5 because there are ways you can find that data.

6 Formerly named NGDC was getting really
7 good at having bathymetric data and elevation
8 data found.

9 So, as we took steps to get to this
10 National Ocean and Coastal Mapping plan, we were
11 making progress, but we still didn't have the
12 plan in hand.

13 So, we got to the point where trying
14 to develop a plan for LIDAR data, for bathymetric
15 data, for the digital imagery that's acquired,
16 for the hyperspectral data that Army Corps
17 collects, you know, there were so many moving
18 pieces in this effort we decided, all right,
19 let's go with something that's really working
20 well and let's focus this first iteration of the
21 plan on elevation data, in particular, LIDAR,
22 topographic and bathymetric LIDAR.

1 And so, we've got this mapping
2 strategy and work for coastal LIDAR. And we
3 decided we would merge it with an effort I'll
4 talk about in a minute called the 3D elevation
5 program mapping effort, which I believe Larry
6 Sugarbaker, I think, talked to the HSRP, didn't
7 he, in, I think, 2013 about what the 3DEP effort
8 is?

9 It's an idea, a plan to map the United
10 States, terrestrial United States completely with
11 high-quality LIDAR data in eight to ten years, I
12 think, in order to have really good elevation
13 data for the nation.

14 So, this 3DEP effort is going on.
15 We're doing our plan and we decided to -- so, we
16 focused initially on coastal LIDAR and we kept
17 sort of bumping into 3DEP, you know. 3DEP is
18 terrestrial topo, topographic LIDAR.

19 It didn't really make sense to develop
20 our plan kind of in a vacuum with the 3DEP
21 effort. So, we've tried to bring those together
22 with a concept called 3D Nation.

1 3D Nation -- sorry, I have to go to
2 these different slides to illustrate. 3D Nation
3 is the idea that we would have high-quality
4 elevation data for the entire nation from our
5 mountains to our deepest seas. So, it's blending
6 the whole effort together.

7 And our interagency working group on
8 ocean and coastal mapping is focused on that
9 coastal zone piece. So, we're looking for a
10 modern, accurate elevation foundation. It's a
11 very high-priority data need.

12 As you can see here in this slide
13 which illustrates the return on investment, the
14 National Elevation Enhancement Assessment did of
15 the benefits of --

16 (Comment off mic.)

17 MS. CHAPPELL: Oh, that's right. I'm
18 sorry. I could ask you to come up and talk about
19 it, but this return on investment, you know, it
20 certainly shows across the nation where the
21 benefit of LIDAR would be, but note the coasts,
22 you know. All of the coasts are in the dark

1 green.

2 So, we have the -- our coastal mapping
3 strategy focused initially on topographic and
4 bathymetric LIDAR.

5 I do want to note that when we get to
6 Version 2, because we will get to Version 2, we
7 will be looking at other types of acquisition.
8 In particular, offshore acoustic aerial
9 photography and that sort of thing, but what I'm
10 going to talk about now is strictly LIDAR.

11 Okay. So, we're building -- in this
12 plan we're building on existing partnerships.
13 We're building on the 3DEP partnership that I
14 already mentioned, but more importantly we're
15 building on the Joint Airborne LIDAR Bathymetry
16 Technical Center of Expertise partnership, which
17 Mike Aslaksen is an important component of.

18 That's Army Corps, led by Army Corps
19 with NOAA and USGS and NAVO. The JALBTCX
20 partnership has made great advances in
21 coordinating on LIDAR acquisition.

22 So, this plan tried to take that, the

1 3DEP effort -- we're really trying to sort of
2 leverage all of the things that are going on in
3 this environment and put them together in an
4 effort to acquire data in this coastal zone,
5 which is just -- I liked Audra's illustration
6 with that lake level viewer showing those data
7 gaps, you know, because that is the zone that
8 we're working on.

9 So, the plan, it's still in work, but
10 it has five components. The first is kind of our
11 stretch goal. It's really an aspirational
12 effort, an aspirational goal that gives an
13 umbrella that all of the agencies can get behind.
14 Sort of I would call it like a supra mission, you
15 know, a mission above all of our individual
16 mission goals, which is kind of hard to get
17 everyone to get behind, but I'm working on it.

18 So, that is -- we take the 3DEP idea
19 of mapping the United States in eight years. But
20 when it comes to the codes, we recognize that,
21 you know, mapping the U.S. shoreline completely
22 and accurately and comprehensively in eight

1 years, we have to come back and do that again.

2 So, we need to actually be on a cycle.

3 That's where we've gone a little bit
4 farther than 3DEP, because 3DEP just says let's
5 do it once and then, you know, we'll think about
6 the next page later, but we're already thinking
7 ahead to these areas are going to come up again
8 and again.

9 Some of them will have to be done
10 sooner because of hazardous events. Some just
11 have to be built in to be mapped more frequently.
12 Some can wait a while, but that concept of map,
13 repeat, you know, rinse, repeat, recycle, that
14 sort of thing is built into our strategy.

15 The second element of it that I'll
16 talk about a little bit more is that every year
17 we need to coordinate on mapping data
18 acquisition.

19 The third is working toward common
20 standards. And I emphasize standards, plural,
21 because there will never be one size that fits
22 all. And I had to realize that.

1 Fourth is a whole life cycle approach
2 to data meaning, you know, acquiring the data
3 isn't any good if it actually doesn't get out,
4 isn't made available. So, that whole sense of
5 stewardship.

6 And then the fifth component which is
7 another element where the JALBTCX partnership has
8 been really great and other activities like the
9 Joint Hydrographic Center, this R&D idea, you
10 know, constant refresh of tools and technologies.

11 So, Component 1 I do need to emphasize
12 that this is aspirational. It is very much
13 something that we could do given a commitment to
14 the concept of 3D Nation, you know, that accurate
15 mapping data set, coastal mapping data set for
16 the nation.

17 Sufficient resources, I should
18 probably put asterisks around that, highlight,
19 exclamation points.

20 And a continued effort at coordinating
21 the acquisition strategy among not just the
22 federal, but also our state partners, our private

1 sector partners, academia, you know, the whole
2 suite of entities that are out there mapping, as
3 Audra also said.

4 So, the Component 1 in our strategy
5 actually builds on what the Army Corps is already
6 doing. And that is that for their sand resource
7 mapping they are getting around the contiguous
8 U.S. and Hawaii on a roughly five-year cycle.

9 The mapping that they do, the
10 topographic and bathymetric mapping that they do
11 is great. It isn't the total answer, it isn't
12 perfect, but they have a cycle and it means that
13 we can -- when we think about our aspirational
14 strategy, we can leverage what already exists and
15 build on this to get to the concept of cycling
16 around the United States in eight years and then
17 coming back and doing it again.

18 So, you can see IS would be an initial
19 survey. This is all a nominal schedule, but
20 initial survey and then resurvey.

21 Everything in the -- below Alaska
22 really maps to what the Army Corps is doing now,

1 their schedule. And then Alaska is factored in,
2 because actually the Army Corps doesn't have any
3 work up there, but NOAA and USGS, for example,
4 do. So, Alaska is sort of laid on over the top,
5 but this whole eight-year concept is there.

6 Component 2, this is not aspirational.
7 This is actually something we are doing now and
8 we can do better. This is where we coordinate
9 annually on data acquisition. We show each other
10 what our preliminary plans are, not just federal
11 agencies.

12 Again, this is working with the states
13 and our private sector partners, local, regional,
14 that sort of thing, but getting together at least
15 once a year conscientiously, and then over the
16 course of the year using perhaps some GIS-based
17 tools that we have to coordinate on mapping data
18 acquisition.

19 We have had one sort of test summit.
20 We had it at the end of the JALBTCX workshop last
21 summer and we will be doing it again this summer.

22 We will be inviting anybody who cares

1 to participate. We'll have that invitation
2 extended to anyone who wants to come.

3 And using SeaSketch, which I think
4 I've demoed to you all before and I'm happy to do
5 it again today, using the SeaSketch tool we will
6 be sharing plans about mapping all with an effort
7 to of course eliminate redundant mapping efforts,
8 streamline what we're doing and just be really
9 smart about where we're spending federal and
10 state dollars on mapping.

11 This is if you haven't seen it, and
12 some of you may have not, especially our new
13 members, SeaSketch mapping tool was something
14 that we built -- we didn't build it. Something
15 that we employed with the Sandy Recovery effort.

16 It was kind of a perfect storm, if you
17 will. When we got the Sandy supplemental money,
18 we had recently heard some briefings by Will
19 McClintock of UC Santa Barbara who had developed
20 this SeaSketch tool to demonstrate how marine
21 planning might happen.

22 His tool used the Channel Islands

1 National Marine Sanctuary Planning Effort as an
2 example and that's what he demoed to us, but we,
3 as agency partners, had always said, you know,
4 it's really hard to coordinate on mapping data
5 acquisition if you can't see well, see easily
6 where each other are working.

7 I know I for one have trouble when we
8 sit around the table and just throw out
9 geographic names, you know. I'm a visual person.
10 I have to see it. I have to see where things are
11 overlapping and where they might just be close to
12 each other, that adjacency element.

13 So, with SeaSketch it just kind of
14 came on the scene at just the right time. It's
15 really easy. We threw our data into it. We used
16 it for Sandy.

17 We could see where -- not only where
18 the initial sort of big three agencies were going
19 to map: Army Corps, USGS and NOAA, but we could
20 also ask our stakeholders, like the states, where
21 they needed data, what were their priorities for
22 mapping.

1 And you can do it very quickly. This
2 is kind of -- the idea behind this tool is not
3 beauty. It's quick and dirty. Just get it in
4 there and then let's refine our ideas once it's
5 in there. So, I think it worked really well for
6 that.

7 And you're probably tired of seeing
8 this example, everybody, but it's a really good
9 illustration of how SeaSketch worked and how it
10 can work in the future.

11 If you'll look, it's a little hard to
12 see, but this -- these are some blue coastal
13 counties. And up in New Jersey there at Cape
14 May, you see some peach ones. And those are USGS
15 topo-LIDAR mapping plans.

16 In the red, that's Mike Aslaksen's
17 remote sensing division topobathy acquisition
18 plans. And we can see, you know, just by looking
19 at it, perhaps even by talking about it, but
20 certainly visually on the map that there is a lot
21 of overlap.

22 And in this particular area, Cape May

1 and the New Jersey coast, we really want to
2 understand why both agencies needed to map or
3 could not coordinate on mapping and, you know,
4 this helped us have the discussion around what
5 was going on.

6 I will say that I always want to be
7 sure and say that sometimes it makes perfect
8 sense for two agencies to map in the same area.
9 And that's okay as long as you know why.

10 And we just wanted to know why and as
11 it happened over the course of the discussion,
12 Mike was able to say that he could cover USGS's
13 area of interest here in New Jersey.

14 And so, he did that and they were able
15 to take their funds, Sandy recovery money, and
16 move them farther north and acquire another
17 county somewhere else with topo LIDAR that also
18 needed doing, but had fallen off the list.

19 And then on the Delaware coast there,
20 USGS, I think, was pretty thrilled that they
21 didn't have to fly tide-coordinated data or even
22 entertain the notion, because Mike was acquiring

1 it.

2 So, you know, that was a savings
3 there, too. Maybe not a huge savings, but
4 certainly a success story with SeaSketch.

5 Then, later, Army Corps which is
6 really, I think, in the -- I think of all the
7 agencies, Army Corps has been the hardest hit by
8 the travel caps. I don't know. They really have
9 had a hard time going anywhere.

10 And when they plan their LIDAR
11 acquisitions as they go around the coast, they
12 like to get out into the districts and talk to
13 their districts and the district partners like
14 USGS, NOAA, other agencies, and they could not
15 get out to the West Coast as they planned their
16 West Coast projects.

17 So, they used the SeaSketch tool
18 through webinars to interact with their districts
19 and their partners and were able to add some
20 mapping efforts, additional areas to their West
21 Coast projects using the tool.

22 And the really exciting thing about it

1 is that both the 3DEP program, again topo LIDAR,
2 terrestrial LIDAR nationwide and the IWG-OCM,
3 coastal nearshore and offshore, have agreed to
4 use the SeaSketch mapping tool to do national
5 mapping coordinations. So, everything will be in
6 here. The 3DEP broad area announcement work, the
7 IWG-OCM plans, it will all be in here.

8 And this is a really good
9 demonstration for what we want to see at the
10 geoplatform, geoplatform.gov, which is where this
11 kind of tool should be and they are working to
12 get it for us. It's just taking a few years.

13 So, SeaSketch is a temporary
14 demonstration of the functionality we want to
15 have, but it's working out really well. And,
16 again, I'd be happy to show you the actual tool
17 later.

18 So, just very quickly moving on, on
19 the strategy, common standards. LIDAR quality
20 levels, we're using the same approach that the
21 3DEP effort has used for topo LIDAR. This is not
22 a final QL chart. We're doing some work to

1 improve what each of the categories is saying and
2 -- but this gives you an idea. We'll have the
3 same sort of quality level balance that the 3DEP
4 effort has.

5 Data management procedures, you know,
6 this is just that whole life cycle approach.
7 Every -- all the agencies will commit to doing
8 this as they really must, but it's very, very
9 conscious.

10 And then fifth is that target of
11 research and development. And we have some ideas
12 in the hopper for near-term projects, and then
13 some that go out farther just recognizing that
14 it's smart to leverage each other's capabilities
15 in work that is ongoing.

16 So, five elements to the strategy. As
17 I said, it's not quite complete. The idea is to
18 put it out for public comment and fortunately or
19 unfortunately, the closer you get to a final
20 draft maybe the more attention people are paying
21 it, which is a good thing, but we're -- so,
22 that's why we still have a little bit of work to

1 do on quality levels and the concept of the
2 eight-year strategy as people are really looking
3 at it.

4 But we're getting there and I think as
5 we get this plan together, we can say we're
6 getting a step closer to that idea of a 3D Nation
7 that you, I think, will be hearing more about as
8 we go forward.

9 I do want to say, again, we're not
10 stopping with LIDAR. When we get to Coastal
11 Mapping Strategy Version 2.0, we're going to --
12 we'll move to the offshore and acoustic
13 technologies and other technologies and hope to
14 emulate successes like what happened out here in
15 California with the California Seafloor Mapping
16 Project.

17 Those are the kinds of partnership
18 efforts we really want to build on. And it's
19 been alluded to over the past couple of days,
20 but, you know, that partnership came about with
21 the State of California and Fugro and NOAA, Army
22 Corps, USGS played a big part.

1 And it's really something that we try
2 -- we're trying to copy in other areas. South
3 Carolina, for example, with some of the wind
4 energy work in the State of South Carolina. Long
5 Island Sound. So, these kind of collaborative
6 partnership efforts where all the different
7 partners are getting what they need and
8 contributing pieces and parts to manage the
9 whole.

10 And I think, yes, I'm going to go into
11 Mike's presentation here. So, I'll end really
12 there on the Coastal Mapping Strategy.

13 (Applause.)

14 MR. ASLAKSEN: Thanks, Ash, and
15 thanks, Audra, for teeing me up. Let's see here.

16 There we go. So, my goal here is to
17 give you an update in the operations within
18 coastal mapping at NOAA.

19 Really, you know, just to brief you
20 where we are in technology and some complementary
21 technologies we're using.

22 An update on where the Sandy

1 supplemental is and delivery of that data. I
2 mean, that's a big deal. It's 2800 square miles
3 of topobathy LIDAR data and imagery and
4 shoreline. About 20 terabytes of data and was
5 about a \$10 million investment by Congress to get
6 this work done. And then I'll wrap up with some
7 of our plans both from '14, '15 and '16.

8 This slide just illustrates the IOCM
9 products produced at NGS. You know, we try to
10 map the ones used many times.

11 These data streams of course first and
12 foremost is the shoreline for charting
13 production. Orthomosaic imagery, that's our
14 baseline technology. photogrammetry is still the
15 measure in a lot of cases of how we're ensuring
16 that we're meeting the quality for charting
17 standards which then often feeds many other
18 applications.

19 And then some of the derived products
20 there we have, you know, LIDAR Point Cloud and
21 elevation data, merged topobathy, DEM data set,
22 intensity from the LIDARs.

1 And then you can actually colorize
2 those point clouds using the imagery for further
3 applications.

4 So, probably should have done this
5 from the bottom to the top and reversed it, but
6 the takeaway here is the complementary remote
7 sensing technology we're using to derive how we
8 and where and when we fly topobathy LIDAR.

9 Being an optical system, we need to
10 know where the water clarity is, when and in what
11 time of year.

12 And so, one of the opportunities we
13 had with Sandy supplemental was to work with our
14 partners at the National Centers for Coastal
15 Ocean Science within NOS who have a harmful algal
16 bloom program, which one of the things they throw
17 out is actually water clarity.

18 So, we partnered with them to look at
19 the operations during Sandy to provide satellite-
20 derived water clarity products. And then also to
21 look long-term to build climatology of data going
22 back to CWIFs and Lotus some 20 and 30 years

1 back.

2 Dr. Rick Stumpf is our partner in
3 that. Very well known in the industry and
4 academia for his work. This is -- the goal here
5 is actually to put that out there for both
6 internal and external uses to have an
7 understanding where to fly or when to fly LIDAR.

8 The middle slide, the satellite-
9 derived bathymetry, again, really, I would say,
10 has blossomed within NOAA especially between us
11 and Coastal Survey as a tool to say where do we
12 need to go and chart, you know.

13 The mindset of maybe we -- how old
14 data may be, we might be changing to where do we
15 know we have problems, where we have done -- used
16 satellite-derived bathymetry for reconnaissance
17 and we have been very enabled by the access to
18 data, both the Landsat imagery, NGA and digital
19 globe imagery that are at little or no cost to
20 NOAA.

21 All of this encompassed with, you
22 know, access and ability of GIS to process this

1 data both cleanly and fast.

2 In the case on the data I'm going to
3 show you, you all know, the Office of Coastal
4 Survey Anthony Klemm basically used Landsat data
5 to look at the issue -- charting issues in the
6 Gulf of Mexico over a few days.

7 So, and then on top of this is the
8 topobathy LIDAR technology, you know. Colin
9 Cooper at Quantum Spatial coined it right last
10 week as going green, because in that, we're
11 really in the capabilities of what the topo
12 sensors can -- they're IR. We can't see them.
13 Cannot penetrate water. Very high rep rate.
14 Very high density.

15 That's where we are with these systems
16 and I think NOAA has built a case for the private
17 sector to invest this, in this technology, as
18 well as put this requirement out there to -- even
19 some of our own panel members have invested in
20 this technology. Ms. Lockhart.

21 And when I show you some of the data
22 examples, I think it's going to be telling of why

1 this is where we want to go, the multi-use of the
2 data and why it really is, as Audra and them have
3 stated, this is the foundation data on which
4 resilience happens.

5 So, just a little bit on some of the
6 products from the water clarity. Again, Lotus
7 imagery up here, you know. The -- which one is
8 the laser here? This is the laser.

9 You know, where it's blue in these
10 areas it's showing us that's where we have water
11 clarity. And from that they've been able to
12 build this gridded product of water clarity for
13 operations.

14 And this is about a day to two latency
15 that we were getting this information, but it was
16 better than going up and flying and looking --
17 and, again, we're also looking at in situ
18 measurements of other systems out there which you
19 can use, but this is very useful.

20 And the key research item that we're
21 looking at is how can we pair laser observations
22 against this water clarity product and refine

1 that water clarity product, but just an example
2 of how we use that and partnered with NOS.

3 Satellite-derived bathymetry, again
4 this is near Tampa Bay. And the idea is, okay,
5 here we have, you know, a pretty high-use inlet
6 just north of Tampa Bay, and where you're seeing,
7 you know, these areas of red are areas of
8 shoaling, you know, on the chart we have looks
9 like some 15 feet there or five feet using these
10 type of technologies to say, hey, this is a place
11 we need to go, you know.

12 This is of course large interest to
13 the recreational boating community, the modeling
14 community, but, again, some of the places on our
15 charts that we want to update using this
16 technology.

17 Another example near Jacksonville,
18 north of Jacksonville, Florida, again you can see
19 how the shoals are migrating out of the chart
20 where it is charted now.

21 And then couple this with things like
22 the AIS tracks. Typically mariners do not want

1 to run aground and often their local knowledge is
2 going to show us where we have problems. And
3 couple this with things like STB to tell us these
4 are areas that we need to go fly LIDAR and/or
5 send vessels.

6 Another example here with migrating
7 shoal. And again, what are the outcomes of this?

8 So, what you see here is a current
9 chart of Mason Inlet in North Carolina. Sorry
10 about the vectors there, but that's actually
11 updated shoreline from the Sandy collective
12 topobathy.

13 And, again, just some of the problems
14 we're trying to resolve with this type of
15 technology. And you're seeing both mean lower
16 level water and mean higher water.

17 Mean lower level water is one of the
18 toughest things to get that's on the chart. If
19 anybody can state to that, Mr. Perkins has spent
20 many a day watching a clock and the tide gauge
21 for that. But, again, the beauty of this
22 technology and ability to survey at almost any

1 time you can get this type of information.

2 But, also, how do we enable and
3 increase the efficiencies of our floating assets,
4 our vessels?

5 And this example, while it didn't come
6 out like we want, we actually planned flight
7 lines ahead of the NOAA ship Thomas Jefferson in
8 an area -- this is Fischer Island Sound near
9 Connecticut and Long Island Sound.

10 But in these areas here we see these
11 flight lines were littered with rocks, really
12 areas you don't want to send launches in, and I
13 know folks, just from an efficiency standpoint
14 and a safety standpoint, more importantly.

15 So, the idea is how can we increase
16 the efficiency of the fleet by going ahead of
17 them, collecting topobathy LIDAR, will it work,
18 provide that as a data set for them to then use
19 against their planning.

20 And then the multi-use of the data,
21 this is pretty telling. This is from Colin
22 Cooper at Quantum Spatial that he presented last

1 week.

2 But, again, you're looking at ten
3 meter NGDC data sets from 1869 to 2010 and a ten
4 meter down. This is the JALBTCX two meter down
5 from 2010. And this is the LIDAR data collected
6 for the part of the Sandy supplemental.

7 And you can see, just see the level of
8 detail there that, you know, of course, you know,
9 maybe more data isn't always the best thing if
10 you're getting 40 or 50 points per square meter
11 in some cases we're getting.

12 But if you look at applications and
13 sea level rise and inundation and what is sea
14 level rise going to do in my backyard, this is a
15 level of data that you're going to want. And
16 this is what the modelers are actually looking
17 for and building models for.

18 And next, a few examples from Dewberry
19 as far as showing some of the data that processed
20 and just some profiles of what we saw and
21 obtained with a sensor, but to give you the idea,
22 okay, that you can see the structures on the

1 beach here, dew line here and then the water
2 surface and then the bathymetry.

3 Cape Lookout off, you know, Cape
4 Hatteras. You can see again profiles of the
5 data.

6 Some of the multi-use especially from
7 the benthic habitat mapping or environmental
8 mapping standpoint, you know. You have the
9 imagery you can see here. Here's the back bay,
10 tidal influence wetlands. You can see areas of
11 overwash here. Really a lot of information just
12 from the image.

13 Then you couple that with, again, this
14 is what topo LIDAR would give you, but this is
15 what going green gets you.

16 All right. So, you can see the total
17 seamlessness of this road, the dune and the dune
18 structure, these overwash areas and all this
19 habitat which I'm not the guy to tell you what it
20 is, but folks want this.

21 I mean, it's an immense data set that
22 I think we're going to find out that was bigger

1 than we ever thought.

2 Again, here's another graph from
3 Dewberry showing topo only. And then once you go
4 green, you can see this.

5 And as Dr. Callender showed yesterday,
6 you can see these oyster beds here from an
7 aquaculture site. You can see the structures
8 here where they formerly were. And in a lot of
9 cases they're trying to build up the oyster bed
10 by moving these around, but that level of detail
11 is remarkable.

12 And, again, just another look at Rich
13 Inlet. And, again, from an application of storm
14 surge, I mean, this is all type of stuff that the
15 modeling community has not seen or had before.

16 And the understanding of how water flows out when
17 inundation comes is something that's critical for
18 them to understand.

19 So, an update of the delivery of the
20 data. We had some challenges. First and
21 foremost the winter of 2013 and '14 were very
22 challenging that caused us a lot of delays within

1 that.

2 And then the processing of the data
3 being new sensor technology has taken a little
4 longer than we want. So, we're up to about a
5 five-month delay, but we're confident and work
6 with our partners to get these latest schedules
7 out. And this is what we're looking at as far as
8 delivery basically working from the south, Myrtle
9 Beach, all the way up through Montauk.

10 In this case, a lot of data has been
11 delivered for South Carolina, North Carolina.
12 You can see a delivery schedule here for -- in
13 April-May for up through Virginia Beach.

14 Again, this is for -- LAS is the raw
15 Point Cloud forming the LIDAR. A DEM is actually
16 graded into a DEM, a topobathy DEM. So, there's
17 some QA between those two. That's why you see a
18 delay there.

19 Going up to Cape May, you know,
20 delivery at the end of June. And then the final
21 schedule takes us basically to the middle of
22 August or July when we'll have everything

1 delivered.

2 Our plans, again, from an imagery
3 standpoint, we're still using imagery quite a bit
4 in a lot of different areas especially in the
5 ports.

6 These large areas of pink are areas
7 that in which with the Sandy supplemental and the
8 upgrading of our camera systems at least at this
9 point we're planning to fly oblique imagery,
10 georeferenced oblique as a baseline data for
11 hurricane response, as well as coastal managers
12 and especially our partners at the USGS are big
13 users of georeferenced oblique imagery.

14 And you can see a lot of port areas
15 here and oblique collects here. And you get
16 color codes of the year when this is going to
17 happen.

18 A lot of the green in this area here
19 has to do with a lot of the marsh area in
20 Louisiana, which we have found to use automatic
21 feature extraction of imagery seems to be the
22 most efficient way to get that shoreline.

1 Topobathy operations, I highlight
2 these green areas. These were areas highlighted
3 by the work by Anthony Klemm of Coastal Survey,
4 as areas of change using satellite-derived
5 bathymetry. And these have been our ongoing
6 operations in the Florida Keys looking at
7 updating the charts in that area along with the
8 intercoastal waterway and then Puerto Rico.

9 And, again, this is where the
10 technology works. You can understand water
11 clarity is something we're looking for. But as
12 we get these products for the climatology from
13 Rick Stumpf, we'll ground this out. Just a merge
14 of the two.

15 Again, the vector data, the shoreline
16 data is all delivered through the north shoreline
17 data explorer.

18 And the raster data, the imagery, the
19 LIDAR, the DEMs we've partnered with of course
20 and are supporting delivery through the digital
21 coast of our partners at OCM.

22 So, with that, I'll take questions for

1 Ashley, Audra or I.

2 CHAIR PERKINS: Dr. Kudrna.

3 MEMBER KUDRNA: Very interesting, all
4 presentations. The last meeting we had in
5 Charleston, Margaret Davidson gave us a
6 presentation. Of course the Coastal Service
7 Center has been taking these data and others and
8 putting it to some practical uses of showing
9 municipalities the impact of sea level rise.

10 In order to fund this and continue to
11 fund it, OMB also wants to know where is the bang
12 for the buck?

13 And I guess one of my questions, is
14 there any documentation of this information
15 creating behavioral changes for municipalities?
16 Have they set back waste treatment plants?
17 Developments? Roads?

18 It would be enormously useful if the
19 three agencies collectively provided some
20 economic benefits of the activities that have
21 taken place to help future funding and
22 continuation of the program.

1 MR. ASLAKSEN: I know Audra can answer
2 this. I know of one example though and some of
3 the forward-looking activities that OCM has done,
4 at least for the Digital Coast in their sea level
5 rise viewer, in that they've opened up that
6 architecture to ingest higher level -- higher
7 resolution data in order to do planning.

8 I know that the City of New York
9 actually use that tool. I think we were briefed
10 on that at one time as an example of that.

11 Audra, as far as the economics of it,
12 you probably can answer that better.

13 MS. LUSCHER-AISSAOUI: Yes. So, I
14 don't know if you guys now that there is a
15 resilience GPRA that is actually tracked through
16 NOAA that actually not only looks at the
17 technical systems and tools that are developed to
18 support resilience, but then it also looks at the
19 long-term change through policy changes. That
20 includes if you change a regulation through CZMA,
21 if you institute a plan, make a number of types
22 of changes within the coastal zone management

1 framework and community.

2 So they keep really quite good records
3 and how has that been kind of applied to the bang
4 to the buck, you know? There has been a number
5 of ways that they've been doing some economic
6 assessments, as well as -- so return on
7 investments for both the programs.

8 And I could, you know, get you some of
9 the recent ones they've done. Billion dollar
10 disasters. Other things that they have applied
11 socioeconomic information to, you know, speak to
12 how the data is influencing decisions in regards
13 to community resilience.

14 So I'd say also in regards to
15 behavioral change, you know, that's a new focus
16 that we're really trying to address more in NOAA
17 that I didn't really touch on in the resilience
18 perspective, but it's a very important part of
19 that, you know.

20 Risk communication, we're really
21 starting to understand that. It's the number of
22 ways you can access it that keeps reinforcing.

1 So if you're seeing data from a navigation
2 perspective, if you're seeing it in a community
3 perspective and they're all kind of saying the
4 same information, that is good risk communication
5 practice and that helps to reinforce.

6 So the more we kind of have these
7 messages that cycle throughout the perspectives
8 that NOAA supports navigation or communities,
9 helps reinforce how people hear information and
10 they hear it a few different ways.

11 So I think risk communication is a
12 very important part of, you know, the concept of
13 resilience. So there's a lot of science on that,
14 but I'll point you to some specific return
15 investment-type activities that have been done.

16 MEMBER KUDRNA: But I guess my
17 question is, is return on investment documented
18 for this by the Agency so you can build the case
19 with OMB?

20 MS. LUSCHER-AISSAOUI: Sure. Yes, I
21 mean, I wrote the two resilience initiatives that
22 got cycled in. And some of that was both, you

1 know, how much the data costs and how much the
2 infrastructure is influencing the changes, you
3 know, those perspectives.

4 So yes there has definitely been
5 justifications that have been put into those
6 budget increases that we reflect, and they come
7 back and they ask us those things as well. And
8 so, you know, justifications have been given, you
9 know, for every one dollar you do in pre-disaster
10 planning, you get \$4 of savings in the recovery
11 perspective.

12 So there's been other national
13 academies' assessments too that not just NOAA has
14 done, but other independent research bodies have
15 done as well.

16 CHAIR PERKINS: Dr. Maune.

17 MEMBER MAUNE: Ashley referred to the
18 National Enhanced Elevation Assessment, which I
19 was the author of. And that whole study was a
20 return on investment study, but it was based
21 largely on topographic LIDAR.

22 But even with topographic LIDAR, we

1 did returns on investment for coastal zone
2 management, for sea level rise, for -- I think we
3 had a little bit on navigation from the different
4 land, air and sea. Rivers and stream management,
5 things like that.

6 And the return on investment minimally
7 was a \$5 return on investment for every \$1 spent.
8 Now, I agree that -- and that was the
9 conservative estimate.

10 We got \$1.3 billion per year benefits
11 from the -- what became the 3DEP program. And
12 the 3DEP program is based on Quality Level 2
13 LIDAR nationwide with Quality Level 5 IFSAR in
14 Alaska. Because Alaska, you just couldn't use
15 LIDAR statewide up there, but that is an example
16 of the kinds of returns on investment you get
17 from LIDAR in general.

18 And I think if you get five to one
19 return on investment from topo-LIDAR, I bet you
20 get at least that from topo-bathy LIDAR.
21 Probably more.

22 CHAIR PERKINS: Thanks, Dave.

1 Mike, can you speak to how far
2 offshore were you able to get good bathymetric
3 data from the airborne bathy LIDAR, you know,
4 either in terms of Secchi depth or water column
5 penetration?

6 MR. ASLAKSEN: Again, I saw some of
7 the profiles out there about the deepness that we
8 saw. And I want to say out of everything that
9 I've heard from Dewberry and our -- you know, and
10 again not being in the crystal clear waters of
11 the Gulf, you know, in the Keys or in Puerto
12 Rico, I think it was 18 meters we saw off Cape
13 Lookout.

14 How far off that is really depends on
15 what part of the country, I mean, you're in, but
16 I'm convinced at any one point in time you can
17 find water clarity. It's just, you know, how do
18 we find it efficiently and be able to derive
19 operations?

20 But the outer coast performance of the
21 sensor, at least the Regal system that we flew
22 probably, you know, isn't what we wanted

1 ultimately, but what was really the eye-opener
2 was how well it performed in the back bays which
3 aren't as critical of a need, whether from
4 navigation, NHPA/SMCA and Coastal Zone
5 Management, but we were able to extract the
6 shorelines, you know, doing low water and high
7 water, which was, again, kind of predominant to
8 chart.

9 CHAIR PERKINS: Were you able to
10 utilize the work that had been done on the
11 automated shoreline extraction using this data
12 set?

13 MR. ASLAKSEN: So, we do contour the
14 data. The process is the data is collected on
15 ellipsoid, uses VDatum to get to mean low water
16 reference to zero the lines contoured
17 automatically. And do the same thing for mean
18 high water.

19 And then the work flow is that those
20 data then are going to go to the contractors to
21 be cleaned and then features added and then
22 brought back for final QC.

1 CHAIR PERKINS: Great. So those are
2 my lead-ins to the really, really big question.

3 So historically, you know, you have
4 been contracting out shoreline mapping for near
5 two decades now. And with this implementation of
6 the new topo-bathy LIDAR data set in the
7 shoreline that you've been able to extract on the
8 back bays and on this Sandy supplemental project,
9 how has it changed the cost efficiency of the
10 program compared to the extremely difficult tide-
11 coordinated, black and white, IR aerial photo
12 collects where this program began?

13 MR. ASLAKSEN: You know, Scott, I
14 don't know if it would be appropriate to give out
15 a cost, but no doubt it does cost more. But the
16 multi-use of that data far outweighs the
17 incremental cost that we receive.

18 And, in fact, you know, again, your
19 experience with doing VDatum tide-coordinated
20 imagery collection alone, this technology while
21 we have to fly a lot lower, offers us a lot more
22 opportunities to fly and collect data on a day-

1 to-day basis versus waiting for tide windows, sun
2 angle and all these other factors to line up.

3 So you know, again, with not just
4 producing a shoreline, but also shallow
5 bathymetry for charting, I think that a cost
6 benefit is there.

7 CHAIR PERKINS: Yes. It's a
8 completely much more robust data set. I just
9 didn't know if you were a one to one or if you
10 were seeing cost savings or cost increase per
11 mile, per chart analysis. It's not a fair
12 question.

13 MR. ASLAKSEN: Yes, I mean, a couple
14 more years will do it, but at this point in time
15 we're seeing the same level of production per
16 year.

17 CHAIR PERKINS: I have one more
18 question and then I'll let someone else ask.

19 The oblique aerial photo program that
20 you showed with the slides of the Gulf Coast and
21 Puerto Rico, so that's going to give you baseline
22 oblique imagery so that you're prepared in the

1 event of another major storm event to do damage
2 assessment, is that correct?

3 MR. ASLAKSEN: There's multi-use of
4 that data set, but, yes, initially it's a pre-
5 event data set that also -- you know, with the
6 partners at the USGS, the Coastal and Marine
7 Geology folks, they use that to actually -- and
8 they have tools to actually look at dune and dune
9 heights and structures, as well as we've gotten
10 overwhelming positive --- from private users,
11 cities, counties just having that data set and,
12 you know, being able to drag and drop it into
13 Esri and exploit it.

14 CHAIR PERKINS: Yes, where I'm leading
15 is will you be able to execute post-storm damage
16 assessments in an automated change detection
17 environment using that as your baseline?

18 MR. ASLAKSEN: I would not say we
19 could do the automatic change detection, but we
20 would provide georeferenced imagery which could
21 be -- that exploitation of the data is not the
22 next step for us.

1 We feel that we can provide good
2 georeference data for those decision-makers to
3 have that they can bring to a GIS. Those tools
4 are there for them to do the exploitation, which
5 FEMA has done in the past through contracts with
6 folks.

7 CHAIR PERKINS: Great. Thank you.
8 And I apologize for monopolizing the time.

9 MR. ASLAKSEN: No, sir. Any time.

10 CHAIR PERKINS: Joyce.

11 MEMBER MILLER: A question for Ashley,
12 or a couple questions. I was involved with IOCM
13 way back in early 2002, I believe it was. And
14 there was going to be a database like you've got
15 for the shallow water topo-bathy LIDAR for sonar
16 data. And as far as I know it never
17 materialized, the planning side of it and such.
18 So, what has happened with that?

19 And you said that acoustic data would
20 be coming into the IOCM framework. When? And
21 what's the funding status for IOCM?

22 MS. CHAPPELL: Okay. We can start

1 with that last question first. You know, IOCM is
2 actually not -- we don't have IOCM funding.

3 With the Sandy supplemental we did get
4 a little bit of funding that we are using for
5 some IOCM demonstrations, which I think are going
6 to pan out as arguing for -- or justifying, you
7 know, spending funds on IOCM projects. But, no,
8 I don't -- we don't have a dedicated funding IOCM
9 stream.

10 However, the NOAA programs and our
11 partners are certainly committed to IOCM projects
12 when and where they can, and I've been really
13 encouraged by people's interests and willingness
14 to try and accommodate.

15 Of course, bad budgets always help
16 that. So in a bad budget environment people are
17 more willing to collaborate, but I think even at
18 -- you know, if things become rosier, I think
19 we've got a good enough foundation that we can
20 continue with these partnerships.

21 I did -- you know, the sonar, the
22 acoustic element, I think we'll start looking at

1 that this fall once we get this first version
2 out. Maybe a little bit later. First of next
3 year, if we have to do any further additional
4 work on this first version, but this first
5 version --- if I didn't say it, I meant to, is
6 really leveraging existing effort of the agencies
7 that are focused on the coastal and nearshore
8 area.

9 There are not as many agencies that
10 are that easy to wrangle for the offshore work.
11 So we're kind of starting with the low-hanging
12 fruit.

13 MEMBER MILLER: Is there a length of
14 function?

15 MS. CHAPPELL: Well, so the SeaSketch
16 tool that I talked about is not just about
17 coastal LIDAR. That's for any kind of mapping
18 effort.

19 So there is coordination, yes, but in
20 terms of developing a National Coastal Mapping
21 plan that is specific to, you know, the offshore,
22 that's going to be in Version 2. That's the

1 piece that we're waiting -- however, there's
2 already been a lot of really good coordination on
3 hydrographic data acquisition and bathymetry.

4 CHAIR PERKINS: Dr. Jeffress.

5 MEMBER JEFFRESS: Ashley, I'm
6 interested in the Coastal Mapping Summit.

7 MS. CHAPPELL: Okay.

8 MEMBER JEFFRESS: And the reason I'm
9 interested in this is there's a strange little
10 agency in Texas called the Bureau of Economic
11 Geology, and they're attached to the University
12 of Texas at Austin. And they have a LIDAR
13 mapping systems that are two years old.

14 One of their functions is to map and
15 monitor coastal erosion in Texas and they fly the
16 Texas coast every year with LIDAR. And so, I was
17 wondering if they're involved in this mapping
18 summit and what sort of standards are set to
19 ingest all this LIDAR data?

20 MS. CHAPPELL: So that's a good
21 question. The Coastal Mapping Summit and, you
22 know, that idea of partnering, it's really open

1 to any entity. Both to contribute priority areas
2 that people want to have mapped, and to bring in
3 plans.

4 We're really trying to, you know, kind
5 of pull in whoever is doing any mapping and talk
6 about standards whether it's a QL2, a Quality
7 Level 2, which is the 3DEP goal, for what we will
8 have a matching Quality Level 2 for bathymetry.
9 We'll be pushing those as the most multipurpose
10 use standards and hope that people would use
11 them.

12 We're going to be developing some
13 tools to help do that, you know, along with the
14 quality levels. The breakdown that you saw
15 there. We hope to include some, you know, draft
16 scope of work, sample templates, scope of works
17 that if a state is contracting for data they
18 might use or --- you know, just to illustrate how
19 we do it, that kind of thing. But the Summit
20 will be open and I hope to reach as many partners
21 as possible.

22 The state geology programs are of

1 course very much involved in the 3DEP effort, but
2 we'll be reaching out to them for the coastal
3 zone piece, too.

4 CHAIR PERKINS: Ashley, do you have
5 the dates of the Coastal Mapping Summit?

6 MS. CHAPPELL: I don't have the exact
7 date. It's the week of June 15th, and since
8 we're building onto the JALBTCX workshop, I need
9 to talk with Jennifer Wozencraft and finalize
10 which portion of -- what date we are going to
11 have to do this summit piece.

12 CHAIR PERKINS: Okay. If you can
13 circulate that --

14 MS. CHAPPELL: Absolutely.

15 CHAIR PERKINS: -- out to the HSRP
16 members, please?

17 MS. CHAPPELL: I will.

18 MR. ASLAKSEN: I've got an update to
19 that. Actually, they're proposing the 16th and
20 18th in Corvallis, Oregon at the University of
21 Oregon State. And Chris Parrish is going to help
22 organize that.

1 MS. CHAPPELL: Yes, I just don't know,
2 you know, what part of the agenda from the 16th
3 to 18th will be the Summit. That's what I meant.

4 CHAIR PERKINS: Okay. That's what I
5 just wanted to verify. When I looked on the
6 JALBTCX website, I thought it said 2014 for
7 Corvallis. So that's why I'm just looking for
8 clarity.

9 And I'm not sure that the sensor
10 package that Gary is referring to that's in the
11 university system, I believe, is a different
12 sensor than what was used on the Sandy
13 supplemental program. So, just --

14 MR. ASLAKSEN: Yes, it's the
15 Chiroptera from Leica.

16 CHAIR PERKINS: So, there may be some
17 differences in the fidelity or the content of
18 those data sets.

19 MR. ASLAKSEN: Well, we'll tee us Ms.
20 Lockhart who's had the fortunate experience of
21 dealing with both sensors.

22 CHAIR PERKINS: That's why she's on

1 this panel.

2 (Laughter.)

3 MR. ASLAKSEN: Yes, sir.

4 MEMBER LOCKHART: Yes, both of those
5 sensors are what I would refer to as new
6 generation sensors.

7 The Bureau of Economic Geology
8 actually got -- I don't know if it was the first,
9 it may have been the second Chiroptera
10 commercially available. So, they have Chiroptera
11 1.

12 The main differences between the Regal
13 and the Chiroptera, the Regal is -- the 820,
14 anyway, that has been used on Sandy supplemental
15 is slightly lower power, but it has a higher
16 pulse repetition frequency. So, it gets more
17 dense data than the Chiroptera, but it typically
18 doesn't see as deeply given water clarity.

19 And so, they're very similar tools,
20 but they may be used for slightly different
21 purposes because of those differences. That
22 would be the short answer, I guess.

1 CHAIR PERKINS: It would be
2 interesting for you to present to the panel,
3 maybe through a webinar or something other than
4 in a formal HSRP setting on the comparison of the
5 data sets if that's possible.

6 MEMBER LOCKHART: Yes, we can
7 certainly do that some time.

8 CHAIR PERKINS: Great. Thank you.

9 MS. CHAPPELL: Thanks.

10 CHAIR PERKINS: All right. So, we
11 have breakout sessions in front of us and a short
12 break, you know, leading into that.

13 There's a little change in the program
14 for the people on the webinar. The Coastal
15 Intelligence Breakout Session is going to stay in
16 this room, and it stays on the same webinar line.

17 So, the Coastal Intelligence Breakout
18 Session has asked to stay in this room and will
19 utilize the existing webinar line that you
20 hopefully are already logged into.

21 So, let's take a short break and --

22 RADM GLANG: Before we all go adrift

1 for the break, let's just recap what we want to
2 do with these breakout sessions.

3 MS. CHAPPELL: Okay. I didn't know I
4 was doing the recap, but I'll do the recap. I
5 can do it. It's fine.

6 We have -- just like Lawson went
7 through the questions for the Arctic Working
8 Group, we have two sets of questions for what
9 will be a Coastal Intelligence Breakout Session
10 and a Coastal Resilience Breakout Session.

11 I hope those are in your folders,
12 Lynne. Yes?

13 MS. MERSFELDER-LEWIS: They are.

14 CHAIR PERKINS: And are they available
15 for the online participants? Okay. Great.
16 They've been emailed to the online participants?

17 MS. CHAPPELL: They've been emailed,
18 yes.

19 MEMBER MILLER: So, there's no Arctic
20 Breakout Session?

21 MS. CHAPPELL: No, there is no Arctic.
22 You're just going to split into what we hope is

1 two roughly similarly populated breakout
2 sessions. One on resilience, one on
3 intelligence.

4 I believe the plan was to self-select.
5 And if it looks like one is just completely over
6 --- you know, heavy with people and the other
7 group has two people, maybe we'll come in and
8 pull you out.

9 CHAIR PERKINS: Right. And just as a
10 point of clarity, the public is invited to
11 participate in the breakout sessions as long --
12 as well as the online participants, and then we
13 repeat these breakout session tomorrow.

14 PARTICIPANT: We're not switching.

15 CHAIR PERKINS: We're not switching?

16 PARTICIPANT: No.

17 MS. CHAPPELL: Stay in the same group.

18 CHAIR PERKINS: Stay in the same
19 groups.

20 MS. CHAPPELL: Stay in the same groups
21 for tomorrow morning.

22 CHAIR PERKINS: Okay.

1 MS. CHAPPELL: Because you might sleep
2 on it and come up with some good ideas.

3 CHAIR PERKINS: Okay. Great. Great.
4 So, Coastal Intelligence is in this room.
5 Coastal Resiliency will move up to the third
6 floor to the meeting room one floor above here.

7 MS. CHAPPELL: So the questions -- do
8 you want to run through the questions? Are they
9 pretty self-evident?

10 RADM GLANG: So, there was a -- I
11 think the intent was to map Dr. Callender's
12 leading questions into each of the breakout
13 sessions if the questions that we have now
14 captured in these one-pagers don't clearly align.

15 So, that was it.

16 MS. CHAPPELL: So we have also printed
17 those out and you have those.

18 We did map into the resilience
19 questions --- his additional thoughts. But when
20 you get into the breakout session -- Rick, you're
21 leading intelligence? And Audra, Mike and I will
22 be in the resilience group, and we'll sort of run

1 through the questions and start thinking.

2 You know, we're not trying to
3 necessarily get to all of the answers today or
4 additional thoughts today and tomorrow. The idea
5 is to start just brainstorming ideas that can
6 then be used as you meet subsequently in further
7 discussions.

8 CHAIR PERKINS: All right. Great.
9 Thank you, Ashley, for the recap. I think we're
10 ready to go into the break and then we'll get
11 rolling with the breakout sessions. Thank you.

12 (Whereupon, the above-entitled matter
13 went off the record at 3:51 p.m. and resumed at
14 5:33 p.m.)

15 CHAIR PERKINS: Well, we've had a
16 couple invigorating breakout sessions here this
17 afternoon.

18 And so, now we will go into the report
19 out from each of the coastal intelligence and the
20 coastal resilience breakout groups. And then we
21 do have a public comment period that we need to
22 attend to as well. So those are the remaining

1 business at hand for today's session.

2 So coastal intelligence is the
3 shoulders upon which coastal resilience sits, as
4 we so eloquently heard earlier today. So I think
5 coastal intelligence should report out first in
6 that case.

7 Okay. So, coastal resilience is
8 fundamental and critical to the nation. So, we
9 should perhaps hear about the resilience first.

10 (Laughter.)

11 CHAIR PERKINS: And then we'll follow
12 up and put it in context of how intelligent it
13 is.

14 MS. LUSCHER-AISSAOUI: Okay. There
15 was definitely a theme throughout the
16 conversation that, you know, we can't do this
17 alone. That we really need to integrate across
18 the agencies from our different perspectives and
19 mandates and, you know, really hone in to what
20 NOAA has to offer to those perspectives. And I
21 wholeheartedly agree with that.

22 There was a number of discussions that

1 kept going towards applications, visualizations,
2 you know, who is the provider, what should these
3 be?

4 And, honestly, it came down to
5 partnerships are going to be a very important
6 part of that. Universities that are more agile,
7 that can serve to, you know, meet user's needs.
8 Even ice was brought up in that perspective from
9 an applications perspective as well.

10 I think we also wrestled with the
11 issue of how much information do you provide to
12 people through these applications? Because if
13 you inundate them with too much information, they
14 don't know what decision to make off of that
15 application or that visualization.

16 Streams, how do we grapple with this
17 new resilience funding that's coming down that's
18 going to be going to communities? Where do we
19 insert ourselves? How do we make ourselves
20 relevant from a navigational or foundational
21 information to these communities?

22 If we put out these grants and I feel

1 like we don't send a strong message that we have
2 this foundational information and we pair our
3 expertise with some of these people who get the
4 grants and make specific call-outs to work on
5 specific issues around our foundational
6 information.

7 So one suggestion was, how do we
8 consolidate a number of gauges together to make a
9 decision support network on storm surge or sea
10 level rise that's not just NOAA's gauges, but
11 it's a whole host of other gauges? That was
12 brought up by the group.

13 The whole perspective on sea level and
14 the contribution of land subsidence and how you
15 need to really work at that level that
16 communities understand that change is very
17 important as well. So we definitely reflected on
18 that for a while.

19 We reflected on incentives. How do we
20 get our information that supports the people that
21 do incentives, like the community through FEMA,
22 the community rating system. How does our

1 information better support those infrastructures
2 that already exist and help people or have people
3 working towards being more resilient through
4 those frameworks?

5 And we also acknowledged how important
6 those advocates on the ground are. This includes
7 Regional IOOSes, coastal zone managers, people
8 that are working through the Sea Grant Extension.
9 We aren't going to be giving this information
10 directly to the public, but we need those
11 advocates that are working in those regions at
12 the local level that can use this information to
13 better integrate into those management
14 frameworks. So we really touched on that as
15 well.

16 Ashley, do you have anything?

17 MS. CHAPPELL: I think the only thing
18 I would add -- Audra covered it all really well.
19 We did a lot of brainstorming.

20 One other element was that the
21 Navigation Services Program should really take
22 some time, when thinking about coastal

1 resilience, to figure out who our users are in
2 terms of these extended suite of products or just
3 the need for the data and figuring out who we're
4 targeting and then whom we're also targeting for
5 the messaging, you know?

6 Is it an internal messaging inside of
7 NOAA? Is it external to our users and being
8 clear about what we're messaging and to whom. So
9 I think Audra covered the rest of it really well.

10 MS. LUSCHER-AISSAOUI: Anything else
11 from the group that was in that discussion that
12 we let out? Anything?

13 Okay. Well, I just want to thank
14 everybody for their comments and their
15 considerations.

16 MS. CHAPPELL: And the public
17 participation, too.

18 MS. LUSCHER-AISSAOUI: Yes.

19 MS. CHAPPELL: We had four people.

20 MS. LUSCHER-AISSAOUI: Yes, we had
21 four people outside of our group.

22 CHAIR PERKINS: Great. Thank you very

1 much. How is coastal intelligence coming?

2 (Laughter.)

3 MEMBER MILLER: Well, I don't have
4 anything to put up. I have to say we were all a
5 bit confused by this layout at the beginning in
6 that everything was about the NOS Roadmap and
7 nobody had the NOS Roadmap. And I think we
8 should have had it well in advance to -- you
9 know, so that we could have been a bit prepared
10 for it.

11 So -- and in getting started, we were
12 very unclear about exactly what was being asked
13 us in terms of looking at the Roadmap and
14 answering the questions that were on the sheet.

15 And so eventually with clarification
16 from Admiral Glang and so forth, it became clear
17 that what they wanted to know was, what are the
18 next steps in --- particularly on the first item,
19 which was -- which is the maximized access to
20 highly trafficked and increasingly space-
21 constrained ports by providing ship managers with
22 up-to-date -- up-to-the-minute information to

1 maintain reliable safety margins, that they were
2 looking to -- for criteria by which to select the
3 new ports -- or the new candidates for the
4 precision navigation systems.

5 This led into talking about a number
6 of the elements that should be considered.
7 There's a large number of them.

8 Some of them -- the more physical
9 things like population, inundation risk, tidal
10 signature swell, number of large vessels, number
11 of smaller vessels, weather patterns. Things
12 that can be quantified, you know, they're already
13 in matrices.

14 But there's other things like what
15 partnerships are available in any particular
16 area? What -- how are people willing to partner?
17 Where is there potential funding? Obviously, who
18 needs it most? What places are most at risk?

19 And Juliana shared with us some of the
20 criteria that she had used in deciding where to
21 go first for GRAV-D, which seemed like very
22 reasonable things to consider.

1 We also discussed --- because
2 precision navigation is -- it's certainly not
3 PORTS, but there are some common elements. And
4 that the panel has in the past repeatedly, almost
5 every meeting that the panel has had, has
6 recommended that PORTS be funded and that has not
7 happened.

8 And so, we had quite the discussion
9 and I don't believe we are at complete agreement.
10 And so, how to roll out the precision navigation
11 systems and how to choose the next candidates for
12 it? And frankly, whether it should be funded
13 like PORTS is, or whether an entirely new model
14 should be created for precision navigation?

15 And that's pretty much as far as we
16 got, except that we -- Dave did discuss that the
17 outcome of C21 was that these seemed fairly
18 reasonable. And that the outcome C13, which CO-
19 OPS is tasked with, doesn't seem to match very
20 well with what CO-OPS actually does.

21 And I would welcome further comments.
22 I was busy taking notes and not really

1 synthesizing things. So, I apologize that it's -
2 - so I mean, please contribute if you think I
3 missed something.

4 RADM GLANG: Can I go? The one really
5 useful thing that Ed Kelly pointed out was the
6 Coast Guard's approach.

7 (Laughter.)

8 RADM GLANG: It's not just one. One
9 of the things, which Ed pointed out -- I listened
10 to every word Ed said and he held the floor.

11 No, it has to do with the Coast
12 Guard's -- the Port and Waterways Safety
13 Assessment, which is their risk methodology for
14 assessing the safety of ports and that framework,
15 we went and looked at it here in the margins and
16 that's a really useful approach for -- that we're
17 going to take a look at that. I like that idea
18 of that PAWSA methodology. Very practical.

19 So I hope that's in your notes because
20 that's very practical. We can crank something
21 out.

22 MEMBER MILLER: What's the name of it?

1 RADM GLANG: P-A-W-S-A.

2 MR. FERGUSON: This is Jeff Ferguson.

3 The LA Long Beach is doing a PAWSA this summer.

4 So I'm going to be participating with that and we

5 can share what -- realtime what's happening in LA

6 Long Beach this summer.

7 CHAIR PERKINS: Thank you. We are at

8 the time in the agenda for public comment.

9 So Tiffany, did we receive anything

10 online?

11 MS. HOUSE: No.

12 CHAIR PERKINS: Okay. We have no

13 public questions posted online. So, looking at

14 the gallery -- great. All right.

15 So tomorrow we do reconvene in the

16 morning. We pick up again with these breakout

17 session topics in working towards developing a

18 work plan for responses on coastal intelligence

19 and coastal resilience. So that is the challenge

20 at hand for us tomorrow morning.

21 There is another public comment period

22 at midday tomorrow 11:45 to 12:00. Then in the

1 afternoon -- that gives us time to do our wrap-up
2 teleconference with Dr. Callender -- oh, he's not
3 calling in. Okay. So, that frees up a little
4 space in the agenda.

5 Some of us on the panel have travel
6 out of LAX tomorrow evening. So I know Susan and
7 Joyce and myself have --

8 MEMBER MILLER: Just in case anybody
9 has similar travel plans, I have a flight at 7:10
10 and I have a shuttle. It's \$19 going at 4:10, I
11 think.

12 So if anybody needs to go to the
13 airport, it's a very reasonable way to do it.

14 CHAIR PERKINS: Yes, I need that. So
15 I will be riding your coattail.

16 MEMBER MILLER: Okay, I have the
17 information so talk to me later.

18 CHAIR PERKINS: Okay. Great. So
19 anyone else that needs to do an early departure
20 before our scheduled adjournment tomorrow? Just
21 the three of us?

22 Well, Friday night in LA. Traffic

1 between here and LAX could be challenging.

2 RADM GLANG: So what's your
3 recommendation there Mr. Chair then? Are we
4 still good with adjourning at 5:00 p.m., or are
5 you asking to move that earlier or --

6 CHAIR PERKINS: I'm asking to excuse
7 myself. I'm not saying that you need to adjourn
8 early, because we do have a vice chair.

9 RADM GLANG: So just -- maybe I could
10 just ask who's willing to work here through 5:00
11 p.m. tomorrow night? All right. Great.

12 So then my other question is we have
13 a variety of things -- pieces of business that we
14 want to do that we don't want to lose track of.
15 So where do we want to be with those activities
16 at the close of tomorrow's business and we may
17 want to work backwards and look at how we
18 allocate our time.

19 We had some business questions, I
20 think, on the working group was probably the most
21 pertinent one. We need a good point of departure
22 for these tasks, the work plan, how you want to

1 continue with that. And then we also -- you
2 know, the panel needs to prepare some kind of a
3 report out.

4 And I think Frank mentioned this early
5 in the process, but as we come across issues
6 during the conversations of the days, to try and
7 summarize those. So if there were any of those
8 issues -- and I think I heard a couple, we want
9 to capture those for the purpose of discussion
10 tomorrow.

11 So I think we want to work a little
12 bit backwards so that we can sort of define where
13 we're going to end up tomorrow at the close of
14 business and have kind of a measured conclusion.

15 MEMBER MILLER: I have a couple that
16 I highlighted as we were working through things.
17 I mean, my notes are not complete, guys. Don't
18 count on them.

19 But Susan made one comment in response
20 to -- my brain is fried. The guy who talks fast.

21 RADM GLANG: Jim Haussener from CMA?

22 MEMBER MILLER: Yes, Haussener. About

1 -- and this is just a local issue that might be
2 good to highlight about the importance of the
3 buoys to the local community.

4 I don't know if that -- you know, I'll
5 put it in the notes for possibles, but if people
6 have burning issues -- I may have a couple more
7 down here. If people have issues that they
8 thought were brought up that we want to include,
9 please go now.

10 MEMBER SHINGLEDECKER: I also see that
11 there was a note about the concern about the
12 inability to keep engineers on the ships and how
13 that was impacting the use of resources.

14 MEMBER MILLER: I have that from
15 yesterday, yes.

16 CHAIR PERKINS: Okay. So just to
17 recap, we have the ship days and the shortage of
18 engineers. We have engagement and outreach from
19 yesterday. Partnerships in the MOA. And now
20 we've got buoys as a local issue that we want to
21 make sure we capture.

22 MEMBER MILLER: Just a second. Do you

1 want to start again, please?

2 CHAIR PERKINS: Sure.

3 MEMBER MILLER: I was on the wrong
4 page.

5 CHAIR PERKINS: Yes.

6 MEMBER MILLER: Okay. Ship usage I've
7 got.

8 CHAIR PERKINS: Yes, ship days,
9 shortage of engineers.

10 MEMBER MILLER: Cooperative agreements
11 I've got.

12 CHAIR PERKINS: Yes, engagement
13 outreach, cooperative agreements.

14 MEMBER MILLER: Okay.

15 CHAIR PERKINS: And then we just
16 mentioned buoys from today.

17 MEMBER MILLER: Yes. Let me go back
18 to today's notes and see -- do we have a working
19 group -- or do we have an administrative meeting
20 after this, or no?

21 RADM GLANG: It's an option. So the
22 6:00 to 6:30 admin session I left as an option

1 thinking that somebody may want to think about
2 how we organize our thoughts for tomorrow, but
3 it's -- I leave it at the discretion of the
4 chair.

5 I think we're all pretty toasted. So,
6 just --

7 CHAIR PERKINS: Yes, coming to some
8 clarity on what our working groups are going to
9 be going forward.

10 MEMBER MILLER: Well, and there's also
11 the issue of our process of --

12 CHAIR PERKINS: True. We have not --
13 we have not discussed the HSRP standard operating
14 procedures process document. So that's your
15 homework assignment so we can do that in our
16 morning session over breakfast.

17 MEMBER MILLER: Procedures and
18 committees. Both.

19 Scott, what about Dr. Callender's six
20 questions? Should that be in our summary, or is
21 that -- I mean, we need to consider whether that
22 is something for the recommendation letter or if

1 it's something perhaps outside of it?

2 I don't know if answers to his -- or
3 if that's a working group issue or something. I
4 don't know. I don't think we're going to have
5 definitive answers by the end of tomorrow.

6 RADM GLANG: So maybe I can help here.
7 The six questions that Dr. Callender pulled out
8 and sort of highlighted in his presentation were
9 meant to flow into the conversations of one or
10 the other, or both, of the breakout sessions.

11 MEMBER MILLER: Okay.

12 RADM GLANG: And in some cases they
13 made it, and in some cases they didn't make it.

14 So part of the tasking for tomorrow as
15 we synthesize a work plan for how the panel would
16 like to respond on some or all of these questions
17 will be to consider it. How do you want to
18 incorporate those, how do you want to assign
19 those or -- you know, you can choose to put them
20 aside because you think it's too complicated or
21 it's not appropriate or -- you don't have to
22 accept all these questions. I think there's

1 plenty of material here.

2 MEMBER MILLER: Okay. So we need to
3 work with that in the working -- in the breakout
4 session tomorrow morning.

5 RADM GLANG: In the breakout session,
6 or as a group after we reconvene from the
7 breakout sessions.

8 MEMBER MILLER: Okay.

9 MEMBER FIELDS: I think as we think
10 about the recommendation letter, I realize that
11 one of the things that we're going to do is the
12 process on how to get that letter done, but I
13 liked the fact that there were three or four
14 specific recommendations and a cover letter. And
15 I think we should work towards that kind of goal
16 for this letter and not have it, you know, three
17 or four or five pages.

18 We should just have one or two or
19 three recommendations, four recommendations, but
20 I think it shouldn't be more than a couple of
21 pages.

22 CHAIR PERKINS: Yes, agreed. And I

1 believe we put a 150-word target in there. So
2 whatever we decide needs to go into this letter,
3 we are going to try to encapsulate that in 150
4 words or less and be clear and succinct in that.

5 MEMBER MILLER: Actually, since we have
6 one that Susan seconded, I mean, we might -- I
7 already wrote up something brief about ship usage
8 just as a draft, you know, that could be used.

9 We have two others right now.
10 Cooperative agreements, and that's just a check-
11 in really, you know. And then the importance of
12 outreach and engagement.

13 CHAIR PERKINS: Right. The cooperative
14 agreements, we've already written to that. So I
15 think that's restating the importance of what
16 we've already put in a prior letter.

17 MEMBER MILLER: Right.

18 CHAIR PERKINS: So that one I think is
19 a cut and paste job.

20 MEMBER MILLER: Yes, and then the
21 other one that we have on the table right now is
22 the importance of outreach and education -- or

1 outreach and engagement.

2 CHAIR PERKINS: Engagement, yes. So
3 do you want to put your draft regarding ship
4 usage and days at sea up on the screen? Do we
5 want to talk about that now while we have a few
6 moments, or -- I'm looking at Susan's body
7 language and that's a big no.

8 MEMBER MILLER: I think better to do
9 it tomorrow, but I -- what I was thinking was if
10 anyone else -- I don't remember the discussion
11 around the importance of outreach and education,
12 but, you know, if somebody who does think it's
13 important would want to write up, you know, 150
14 words on it -- or a hundred words if that's the
15 case, then we'd have a second item to consider.

16 CHAIR PERKINS: I'm looking at Frank,
17 because Frank handed that to me on the --

18 MEMBER KUDRNA: Maybe less than 150
19 words, but I'll give it a shot.

20 CHAIR PERKINS: Okay. Great. Great.

21 MEMBER MILLER: And then we'd have two
22 written up. And if something else comes up from

1 either the breakout sessions or other discussions

2 --

3 CHAIR PERKINS: Okay. If you have
4 something drafted, can you email it to --

5 MEMBER MILLER: I'll have to pull it
6 out of other things that -- this is a mess.

7 CHAIR PERKINS: Yes, I'll read it
8 while I'm in the shower.

9 (Laughter.)

10 CHAIR PERKINS: I think we've exhausted
11 our usefulness for the day.

12 MEMBER MILLER: Thank you.

13 CHAIR PERKINS: All right. So with
14 that, we will adjourn. It's been a long day.
15 It's been a fruitful day. So, thank you for your
16 efforts.

17 (Whereupon, at 5:59 o'clock p.m. Day
18 2 of the Hydrographic Services Review Panel
19 (HSRP) public meeting was adjourned.)
20
21
22

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In the matter of: Hydrographic Services Review Panel

Before: US DOC/NOAA

Date: 04-09-15

Place: Long Beach, CA

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