VOLUME I

HYDROGRAPHIC SERVICES REVIEW PANEL

PUBLIC MEETING - TUESDAY, APRIL 14, 2009

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The Public Meeting of the Hydrographic Services Review Panel was held on Tuesday, April 14, 2009, commencing at 8:45 a.m., at the Renaissance Baltimore Harborplace, 202 East Pratt Street, Baltimore, Maryland 21202, before Robert A. Shocket, a Notary Public.

REPORTED BY: Robert A. Shocket

AGENDA:

THOMAS SKINNER, Chair

EDMUND WELCH, Vice-Chair

FORMAL MEETING OPENS - Welcome to Inner Harbor Baltimore

Thomas Skinner, HSRP Chair

CAPT Steven R. Barnum, HSRP Designated Federal Official

HSRP BUSINESS and UPDATES:

Approval of NOAA 19-20 2008 HSRP Meeting

Introduction of Juliana Blackwell, Director,

National Geodetic Survey

REGIONAL STAKEHOLDER PANEL:

CAPT Eric Nielson, President, Association of American Pilots

Frank Hamons, Deputy Director for Harbor Development,

Maryland Port Authority

Keith Bailey, Maryland Society of Surveyors

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REGIONAL STAKEHOLDER PANEL:

Stuart FitzGibbon, American Sugar Refining, Inc.,
Domino Sugar Corporation

David Nemerson, Conservation Biologist, Baltimore Aquarium

Stephen M. Golder, Chief Survey Team,
U.S. Army Corps of Engineers, Baltimore

FY09/10 and STIMULUS BUDGET UPDATE:
CAPT Steven R. Barnum, Director, Office of Coast Surveys

PUBLIC COMMENT PERIOD

2009 UPDATE OF CO-OPS PROGRAMS

Michael Szabados, Director, Center for Operational
Oceanographic Products and Services

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UPDATE FROM ALASKA:
John Oswald

NOAA NEXT GENERATION STRATEGIC PLAN:
Paul Doremus, NOAA Office of Program Planning and Integration

NATIONAL GEODETIC SURVEY UPDATE:
Juliana Blackwell, Director, National Geodetic Survey

REVIEW OF PROPOSED RECOMMENDATIONS from DAY 1

MEETING WRAP-UP, NEXT STEPS, and EXPECTATIONS for DAY 2

PUBLIC COMMENT PERIOD

CONCLUDING REMARKS

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

MR. SKINNER: Good morning, everyone, and welcome. This is the Hydrographic Services Review Panel meeting in Baltimore. My name is Tom Skinner. I'm the chair of this panel. And to start off, if we could go around the table here and introduce the different members of the panel, that would be great, starting with Larry.

MR. WHITING: I'm Larry Whiting, a retired hydrographic surveyor from Alaska, so, I'm well retired.

MR. WEST: Dick West, retired, Navy, oceanographer with the Navy and President and CEO of Core Securities. And I'm retired, and I will retire from this guy pretty soon.

MR. WELLSLAGER: Matt Wellslager, program manager, South Carolina Geodetic Survey.

CAPTAIN MYTARDIS: Minas Mytardis, Vice President of Regulatory Compliance, with Norwegian Cruise Line, not retired.

MR. McGOVERN: Andrew McGovern, pilot, Port

of New York and New Jersey.

MR. SZABADOS: Mike Szabados, Director of CO-OPS.

MR. ARMSTRONG: Andy Armstrong, the NOAA Codirector of the Joint Hydrographic Center at the University of New Hampshire.

MR. LOWELL: John Lowell, Chief of Marine Chart Division at Office of Coast Survey.

MR. WELCH: Ed Welch from Alexandria, Virginia, and I do governmental policy work for the Passenger Vessel Association and the Union of Greek Shipowners.

MR. SKINNER: Tom Skinner with Durand and Anastas, Environmental Strategies in Boston, Massachusetts.

CAPTAIN BARNUM: Steve Barnum, Captain, Director of Coast Survey.

MS. WATSON: Kathy Watson, HSRP, Office of Coast Survey.

MR. DASSLER: John Dassler, Director of Marine Services, David Evans & Associates.

DR. JEFFRESS: Gary Jeffress, Professor of Geographic Information Science at Texas A&M University, Corpus Christi.

MS. DICKINSON: Elaine Dickinson, BoatU.S.

MS. BLACKWELL: Julianna Blackwell, Director of the National Geodetic Survey.

MS. CHAPPELL: Ashley Chappell with Office of Coast Survey, supporting the panel.

MS. STUBY: Danielle Stuby, supporting the panel also. I'm with National Geodetic Survey.

MS. DENTLER: Virginia Dentler, support the panel, CO-OPS.

MR. SKINNER: And we have a couple of people in the public section, if you wouldn't mind introducing yourselves.

MR. MARTIN: Ed Martin, Office of Coast Survey.

MS. O'BRIEN: Susan O'Brien, National Ocean Survey.

MS. TROMIG: Kristin Tromig, CO-OPS.

MR. SKINNER: Great. Thanks very much.

Steve?

CAPTAIN BARNUM: Thank you, Tom. A couple logistics, details here. The evacuation in case of emergency is to exit these meeting doors and go to the right. Go to the exit sign, walk down the stairs, which will take you to the street outside. The restrooms are located outside the meeting room doors and to the right. I think everybody has discovered the coffee back here so please help yourself.

I do want to introduce a new member of the panel, is Juliana Blackwell, who is head of the National Geodetic Service. With the retirement of Dave Zilkoski, Julianna has been selected and appointed as Director of Coast Surveys. So welcome, Juliana.

I would like to remind the panel members as well as the members of the public, the mission goals of the Hydrographic Services Review Panel, HSRP. HSRP is governed by the Federal Advisory Committee Act and established by the Hydrographic Services Improvement Act Amendments of 2002.

This panel is charged with advising the

NOAA administrator on matters specified in the Hydrographic Services Improvement Act, specifically related to hydrographic services. In a nutshell, hydrographic services are those services provided by three program offices within NOAA, the National Geodetic Survey, the Center for Operational Oceanographic Products and Services and the Office of Coast Survey.

The panel membership consists of fifteen voting members. These are nongovernment employees appointed based on their particular expertise. Members of the panel do not represent the organization or the entities they are employed by but again they are on the panel by the mere fact of their particular expertise. The members are appointed to serve four-year terms.

There are three nonvoting government employees: Andy Armstrong, Codirector of the Joint Hydrographic Center; Julianna Blackwell, Director of the National Geodetic Survey and Mike Szabados, Director of the Center for Operational Oceanographic Products and Services, and that will include myself,

Steve Barnum, Director of Coast survey. There is one additional nonvoting member, and that is Andy's counterpart from the University of New Hampshire and the other Codirector of the Joint Hydrographic Center, Larry Mayer. Our meetings are required to be held minimally twice a year.

I would like also to remind everybody when you speak to identify yourself, use the microphones and to speak slowly in consideration of our reporter here, and that's Bob Shocket here to my left. So, if we have any public that has arrived, please use the sign-in sheet at the entrance of the door and I'd appreciate that. Thank you.

MR. SKINNER: Thanks, Steve and thanks also to the NOAA staff in putting this meeting together. It's always a challenge to coordinate everyone's schedule and find a location and get as many people as we have here today. So, thanks very much for that. If anyone needs wireless connections, contact Kathy, right?

MS. WATSON: Yes.

MR. SKINNER: And she can arrange that. We have someone who has just snuck in. Would you like to introduce yourself?

MR. BROWN: I'm Doug Brown. I'm with the National Geodetic Survey. I'm Geodesy program manager with the survey.

CAPTAIN BARNUM: Good to see you, Doug.

MR. SKINNER: Nice to see you, Doug. Doug is responsible for getting me on this panel so you can blame him.

(Laughter)

MR. SKINNER: Excuse me. First order of business is to approve the minutes from November 19th and 20th of the meeting in Tampa. Are there any changes, suggestions, additions? Is there a motion to approve?

PARTICIPANT: So moved.

MR. SKINNER: Second?

PARTICIPANTS: Second.

MR. SKINNER: Any discussion?

(No affirmative response)

MR. SKINNER: All in favor?

PARTICIPANTS: Aye.

MR. SKINNER: Any opposed?

(No affirmative response)

MR. SKINNER: Any abstentions?

(No affirmative response)

MR. SKINNER: The minutes are adopted. I would also like to welcome Julianna to this panel. I think the panel, as you know, has been very active in a lot of the areas that you are dealing with and we look forward to seeing you here and at future meetings so welcome.

MS. BLACKWELL: Thank you.

MR. SKINNER: We'll jump right into the first stakeholder panel. We've found that these panels as we meet in various locations across the country are one of the most interesting, for us, aspects of the meetings, that really gives us some insights into what's going on at different locations in the country. So, with that we will start right in.

Our panel consists of Captain Eric Nielsen,

with the Association of American Pilots; Frank Hamons, Deputy Director for Harbor Development with the Maryland Port Authority; Keith Bailey with the Maryland Society of Surveyors; Stuart FitzGibbon with the American Sugar Refining Company and a part of the Domino Sugar Corporation; Steve Golder, chief survey team, U.S. Army Corps of Engineers; David Nemmerson, conservation biologist with the Baltimore Aquarium and Captain Brian Kelly, the U.S. Coast Guard Captain of the Port here in Baltimore. So welcome, all of you. We look forward to your comments. I don't know if there's a specific order. Is there a --

MS. DENTLER: Right down the line.

MR. SKINNER: Right down the line. All right. Please begin.

CAPTAIN NIELSON: Okay. Good morning. I am Captain Eric Nielsen. I'm President of the Association of Maryland Pilots. I apologize for my cold today. And if I shook anybody's hand perhaps you think about boiling it. I also want to apologize for the weather today. In Baltimore generally throughout

April it's sunny every day and 85 degrees. And frankly I don't know what happened today but maybe tomorrow will be better.

This morning my goal is to share with you the NOAA products that are used by the Maryland Pilots but first a brief thumbnail of what the Maryland Pilots are. We're sixty men and women. We provide bay, canal, river and harbor pilotage throughout the Chesapeake Bay. We handle about 5,000 ships annually and we board at the mouth of the bay in Virginia or in the C&D Canal and bring ships to Maryland ports.

These are our two deep water routes. Baltimore is blessed to have two ways to get to it. The southern route, which is 150 miles, is 50 foot deep and the northern route, which comes through the Delaware Bay and through the Chesapeake and Delaware Canal, and that's 35 feet deep.

Now, for the products we use, starting off with charting products, like many associations, pilot associations, we use portable piloting units to assist in navigating and managing traffic. Our group uses

units that utilize NOAA's electronic navigation charts, the F-57 vector charts; they're updated quarterly and more frequently if necessary. And because they are vector charts, pilots are able to personalize them to their own desires. We have a default, of course, also should things should things go badly and it can go right back to that setting but pilots are able to overlay different types of depth curves and soundings, whatever they want to do. This is just an example of two ships meeting.

We also courtesy of NOAA's hydrographic survey vessels receive immediate notification of obstructions that are discovered. There I was pointing to a 28 foot obstruction here, in my example, which about 12 to 15 feet off the bottom of the bay, the bay's bottom, which clearly would be an impact to us. And in the routine survey that, for the lower bay this was discovered. And there's the next picture up to the right. It's something that we believe fell off a barge. It was immediately, we were immediately notified and then it was very quickly put onto our

vector charts. Here's another more interesting example that's more easily identifiable in the bay.

We also are able to use, are privileged to have the Bay Hydrographer and now the Bay Hydro 2, to provide surveys, fast turnaround surveys for special projects. In this example, this is in Baltimore Harbor, of course, and MARAD wanted to put a ship over Pier 8 and we needed to maneuver around the demolished Pier 7, which you can't see, between Piers 6 and 8. The Bay Hydrographer was able to find that there were some remnants of the destroyed pier in the slip where we went to maneuver the ship and we were able to, once we knew that, those obstructions were there, the contractor, a contractor was able to remove them and now we have the ship in there.

We also use paper charts, and this is an example of the print-on-demand product that provides personalized updated charts. Our harbor chart has all the terminal names and pier depths overlaid on it, which is very useful for, I say, particularly our new trainees but some of the older pilots need to have a

refresher, too. For the, we also obviously use to a great extent the PORTS information. This is our Links Page on our proprietary Website and you can see the, at least those are the topics that have all the different PORTS sites that pilots use all the time, and this is accessible from the laptops while we're on the bridge of the ships. Our laptops are locked down in that you cannot go anywhere on the Internet. You can only go to these sites. And these are chosen because of the popularity amongst the pilots.

So, of the PORTS sites, the topic you see on these slides, the graph, this one shows specific gravity or solidity and this is obviously very important for the ships that are going to be loading here. We have a port that varies from fresh to brackish throughout the year depending on the amount of rain and for loading and taking maximum load and taking into account the specific gravity of the water so the ship can maximize load. This is an important feature. Another one we use frequently is the tide height. We only have about a foot and a half tidal range here in

Baltimore but we do use high water to load additional cargo into these ships to maximize profit and to do it safely. I think Frank will have more on that.

The other draft issue we have is air draft. That's a picture of one of the bridges in the Chesapeake and Delaware Canal and the clearance is only 136.4 feet at mean high water. So that's a challenge for a lot of today's ships. We will either slow a ship down, or, well, we'll slow a ship down, if necessary, to make sure we're not arriving at these bridges out of high water and they're not going to fit in.

For very special circumstances or our projects, we use the Chesapeake Bay Operational Forecast System, the CBOFS, which will give us data on unusual circumstances so we can take advantage of it. In this case you can see that you have the astronomical tides in blue, the meteorological tides with the green dashed line and then the actual tide is the red Xs, or the red line.

We use this for planning purposes for maneuvering a ship that is very deeply laden into a

berth, or, in this example, to get underneath a bridge that has very limited clearance. That's a container crane headed out of the Port of Baltimore, an old container crane. And on this picture you can see the guy at the top measuring it. You know, we had about a foot extra clearance there.

The bridges, not only Chesapeake and Delaware Canal but also the Bay Bridges and the Key Bridge all have air-gap monitors now. We also follow water temperature, particularly in the wintertime and as the temperature drops we prepare for ice operations. A lot of you probably don't realize that that's the way Chesapeake Bay looks like in the winter, and it affects our operations because launches can't get through there. We will close the launch service and Chesapeake and Delaware Canal and board ships at the mouth of the Delaware or Philadelphia terminal, Baltimore, and this gives us a heads-up about when this is going to happen. Because of the length of the bay, 150 miles, we use a lot of the port stations, and that's our example of them.

The wind for a lot of Baltimore ships is a big impact. We specialize in car-ships and row-rows, and to a growing extent passenger ships. All these ships are severely impacted by weather. And this graph at the top shows both direction, wind speed and gusts, which gives us an idea of how we're going to be handling these ships. And this one shows how it's going to be throughout the transit. This is an interactive one that gives you a short-term forecast for the surface winds. We also have an LNG pier here in the Chesapeake Bay and there's a station on the pier that provides all the data we need for handling these very large LNG ships.

Then at the, excuse me, the mouth of the bay we have a relatively new wave buoy off Cape Kettering that gives us, of course, wave height and direction to help us board or disembark a ship by making a lee.

Now, some of you know, some of you don't know, a lee is produced by using the ship itself to block the wind and waves so we can safely jump between

our pilot launch and the ship's. Here's an example of our launch we had on a typical day. And, using the, well, because things haven't -- some things have changed but a lot of things haven't changed, we still climb aboard these ships just like we have for hundreds of years.

The wave buoy gives us a little better heads-up so we can make a better lee. There's a picture of a good lee, relatively calm, pilot going up the side of the ship. And then here's an example a bad lee. And that's it. Those are the types we use. My input would be please keep funding all those projects. Thank you very much.

(Applause)

MR. SKINNER: Thank you, Captain. I think we'll hold panel questions until we go through all of the different presentations. And, Captain, we appreciate you being here, cold or no cold. So, thank you very much for making the effort. I will give you a heads-up that one of the things that, the questions that we tend to focus on are what is being done that's

right that you would like to see more of, where could there be improvements, give some feedback to the panel, so, as your, to the other presentations, if you could think about that, that will probably be the focus of some of the questions. So, and the next, next presentation.

MR. HAMONS: Good morning. I'm Frank Hamons, and Deputy Director for Harbor Development for the Maryland Port Administration. Just to give you an idea of what we do, we are responsible for everything that takes place in waterside for the port. And, we are kind of unique in the fact that we are responsible for coordinating all the dredging of the channels. We also look forward long-term how much dredged material will be generated.

So, we look all over the bay for dredged material placement sites, options, things to do with the dredged material. And, we select, design, construct and operate those sites and we also coordinate all navigation systems for the port along with, we use a very effective committee on which plays

a very large part, our Harbor Safety and Coordination Committee, and we're able solve all kinds of problems right then and there using that committee, that works marvelously, I think. The Pilots are on the committee, Corps of Engineers; Coast Guard is on the committee, everyone who is needed to solve a navigational problem or a channel problem.

I hated following Eric because he gets the sexy part. You know, we're the local sponsor for the ports and I convinced our people to take ports, limited-support ports by going to our executive director and I had gotten the script from the pilots, and I set him down and said here, do this, I'm going to give you some situations here, going to give you a scenario in the Chesapeake bay and I'm going to put you on the bridge of a ship and we're going to navigate a hundred and fifty miles up the Chesapeake Bay to the Port of Baltimore.

And, I had already gone through this with the pilots so that we knew that the conditions at each channel section was right and we had cross-winds and

cross-currents and everything else, and what he'd have to worry about, et cetera. And by the time we got to Baltimore he said do it. So we became a local ports sponsor and we have the largest port system I think in the country because it comes all the way, 150 miles up the bay and then goes through the C&D Canal, so, and it serves us extremely well.

So, what I'm going to tell you, just a little bit about the Port of Baltimore, pertinent facts and that we use the system, the NOAA's navigation services products, hydrographic surveys, NOAA charts, PORTS system. I won't talk much about that because I knew Eric would. And potential modification, we had one thing, okay, we'll bring this up, and I'll show you what it is. It's not that bad. It's a minor thing. It's just procedural.

Port of Baltimore, major economic engine for Maryland, 50,200 jobs and, you know, if you have been in any port, it's obligatory, ports have to tell you this. We have to tell you how important we are. 68,300 other jobs directly related, 3.6 billion in

personal wages and salaries and some of the other stuff that I left out. An inland port with 135 miles of dredged channel -- and that's key -- 50 foot southern approach, 35 foot northern approach channels, generates about five million cubic yards of dredged material annually and that's where we make a lot of use in NOAA charts.

And I don't know if you have ever thought people use the your charts in that way but I tell you, we use them extensively in the Dredged Material Management Program. And base data for preliminary scanning and potential placement site options, we look all over the bay and looked at several hundred sites and options.

The first thing we do is pull out the NOAA chart. We do it electronically. We do it with paper. And, you start looking because there's a lot of things that are important when you are selecting a site. One of the most important things happens to be the hydrography, how deep is it, what kind of contours do you have there, et cetera. So we start with NOAA

charts.

And we only had one incident, which I had to smile about, and I'll tell you about that, too, because we were looking in one place, said how old is this data, it's being resurveyed, and NOAA's out there at the time resurveying the data. It was being resurveyed on its hundredth birthday. It was, the data was a hundred years old and surprisingly still pretty accurate. But it was being resurveyed so that was fine. What we do is we then start selecting these options. You go through and then you start screening them and cutting them down. It's a short list.

All of this, you are still working on the NOAA data and you know your preliminary calculations of how much it's going to take to build dikes in this area, if you're going to build dikes, what the capacity of the site would be, what kind of environment you're in, if you're in shallow water, deeper water, whatever. So it has an environmental implication, what you're doing, helps you makes the selections. And you're doing all this before you really, this all planning

level data but it's critically important to us when we're doing this.

Now, we also use electronic files here, Raster images imported to CAD and then used for site layout design. And we do quantity takeoffs at recon level of investigation, using NOAA charts. So, anywhere in the whole bay is game for this. You know, we will look at a product anywhere and, fortunately NOAA has recently been resurveying a lot of the bay so we have a lot of good recent data to work with. Here's just an example to show you. This is the outline of Masonville. This is, this site is under construction right now, an outline showing that that's how we started with the NOAA charts. We do all of our preliminary calculations using the charts.

Now, determining initial project planning dimensions for new access channels and access channel modifications, we do that, too, to meet desired limiting depths, scaling channel dimensions and making rough projections on channel design and dredging quantities. Basic accuracy of NOAA charts is essential

to the generation of planning level project data.

The more recent the survey, of course, the more accurate the estimated project data will be because of the fact that the bottom data is very accurate. And here's an example of that. And this is a cruise ship channel modification that we did to South Locust Point and you can see that we, you know, we just did a section here off NOAA chart, plotted it out, determined what the project was going to require, et cetera, works beautifully. So, I don't know if this is one of the things you had in mind when you started doing these charts but they certainly work well for us in both paper and electronic form again.

The PORTS System, Port of Baltimore, again, it's near the head of the bay, 150 miles, 70 miles of dredged channel on its southern approach, 113 nautical miles of the ocean, 65 miles of dredged channel on its northern approach. So, if you run through, Eric is bringing ships through a lot of dredged channel, definite dimensions. Middle of the bay is fine. He can open up, you know, run twenty knots up the middle

of the bay but dredged channel is a different story especially in the C&D. In this 65 miles of dredged channel, on its northern approach, 113 miles takes you all the way down to Delaware to the ocean. This is four hundred feet wide, this channel.

So, it isn't a lot of room for error in that one. Coming through, and ships that come through there over 900 feet, 970 feet, I think, so, you can't stop and turn around too easily -- so it's a, it's very important for us to keep these channels as clear as we possibly can and that's, from my perspective that's where the NOAA -- comes in, we're selecting and planning for the dredged material placement options that we have around the bay.

And we're just shutting them down on Miller Island, another one Poplar Island where we dredge material and we're recreating, reconstructing those islands, debating what was there before, Poplar Island is 1140 acres right now, soon to be expanded by another 570 acres, half wetlands, half upland. And so we're adding, added that back into the bay using dredged

material. And, it all started with the NOAA chart.

So, with the port's ships in transit Baltimore channels safely and cost effectively while loaded to with two to two and a half feet of the bottom. That's important. Most ports drain their channels now just to stay competitive, of course do it effectively as long as its maintained and for that we need places with dredged material. And, Eric talked about the ports -- sailing addition.

So, updating NOAA charts to show recent modifications. Here's potential modification of procedure. We had a client, one of the largest shipping lines -- actually the second largest in the world, the largest survey in this port, and we modified our channels at Seagirt Marine Terminal so they could add some extra depth to the ships coming in.

And they were actually, saying is it done, is it done? Well, it was done and we wanted to get it on the charts because, you could talk to a shipping line all you want and say we're leaving this channel but they want to see it on the chart and that's the

only way it's going to work. We couldn't get it on the chart.

The reason we couldn't get it on the chart is because NOAA wanted a Corps of Engineers survey and we had some of the best hydrographic surveyors around who had done this but it still had to be a Corps of Engineers survey. The problem was Corps was busy so we're trying to respond to there customer's complaints about I want to take ships in there about three feet deeper and but he couldn't do it until some of the charts for liability reasons, et cetera. So what we would suggest is that you might consider using certified hydrographic surveys commissioned by ports, re-updating project dimensions on the depths on the charts.

The reason I say there I know the Corps of Engineers and work with them all the time but I suspect that if you went from one district to another district, had them both do the same hydrographic survey you would run into the same kind of differences between those two surveys, you would between any other surveys. So what

you really need to make sure is that it's a good survey, that it's been done well and there are ways to check those, you know.

So, basically, that was the only thing. Like I say, it took us three months to get it done and that was pretty good, I think, and we stayed after it and we had a lot of help from people within NOAA but it took us that long to get the Corps to get the survey so that we could actually get it changed.

So, basically, statement of support, MPA recognizes the importance of the services and products provided by NOAA for navigation to and from the Port of Baltimore. Ninety-five percent of world's cargo moves by water. It is important to ports and to world trade that services provided by NOAA are continued at or about existing levels. I mean, we use you guys all the time and we appreciate your cooperation with us on the Harbor Safety and Coordination Committee. It works well and, we wouldn't want to try it without you so thank you.

(Applause)

MR. SKINNER: Thanks very much. Captain Barnum and I were talking about how most photographs you see with the height, the gap from bridges are from San Francisco. It's nice to have one sort of right in the backyard of -- well, not nice to have one but it's nice to show the example sort of right in NOAA's backyard here in Baltimore. So thank you very much.

MR. BAILEY: Good morning. My name is Keith Bailey. I'm the President of the Maryland Society of Surveyors. I apologize if you do not have a select power point. I've been undergoing some professional changes in last four weeks so resources were a little bit limited so it's just going to have to be the entertainment today.

Tell you a little bit about our organization. We have over 800 members of office and field technicians, including licensed surveyors. We're an organization for the advancement of surveying, particularly in the State of Maryland -- the education of the public we assist and developing standards of accomplishments. When I tell you what land surveyors

do you understand how important NOAA's services, particularly the National Geodetic Survey is to us. We determine positions, positions of boundaries, existing features such as roads, buildings, utilities, the shape of the ground and new construction. So, what you offer is extremely important for us.

What we particularly use is the National Spatial Reference System or the NSRS. A lot of the counties in the State of Maryland save a few of the western counties require that new development be on a referenced coordinate system, which NGS provides. It's continually moving, particularly if you talk to Michael Farmer and Dave Doyle, they know the ground is continually shifting. So, there's always continued enhancements with the NSRS.

We rely on heavily the state agencies that we work for, particularly State Highway, MBTA, MTA, require those surveys to be on a specific coordinate system, Maryland State Planning Coordinate System. Without your established permanent control stations, we could not do that. The first thing that we do when we

obtain a project is to get on that Website and find out where your control stations are. That's the first place we go. I know it's saved in my favorites. It also helps to enhance our vertical and horizontal accuracies for our control, which is also very important because we do have to adhere to a minimum set of standards within the State of Maryland that requires us to achieve a certain level of accuracy.

One of the other operations that we use is your continually operating reference system or your core stations which are located throughout the country; actually, it's throughout the world if I'm not mistaken. It supports global positioning system projects, which a lot of surveyors these days are very well versed in and very much a part of. It also helps to assist in the real-time kinematic networks that a lot of the vendors are using or establishing.

It used to be that when we began a project, if it was to be a GPS project we would have to establish a network which would take hours for us to go out to survey and we would have to calculate

the boundaries, put horizontal and vertical and then perform a site adjustment and download all that data and then we could start surveying. But the real-time kinematic networks that are accessing all of your core stations, all we do is we dial into the surface and we start surveying. So, we're taking twelve hours of work and reducing it to about fifteen minutes.

The course also helps to create density and redundancy for people who will do the GPS networks. Typically the GPS networks are done when there's an extremely high level of accuracy that's required. These will allow us to pull the data down from the Website and add it into our calculations, which again helps us to adhere to rigid accuracy standards. It also provides ties to the National Spatial Reference System, so if we don't, if we cannot find a benchmark or a horizontal control station within the limits of our project, we go ahead to GPS and bring in the CORS data; we're on the system. We're good to go.

The other thing that we use is the Online User Positioning System or OPUS. This is a great tool.

It's a very, very good tool. Again, we use it in concert with GPS. This allows us to download our GPS data and upload it into the OPUS system and within a matter of minutes we will receive an e-mail to calculate the values. Now, I will tell you that not everybody uses this as their final values. They will use it as a check, however. So, it does, it assists us in providing quality controls and it's very simple and easy to use.

What I would suggest is to continue the enhancement of the NSRS system. Again, as I mentioned, the earth is continually moving. There's continuing adjustments in the Geoid and this allows us to maintain the level of accuracies that we require. Continue to improve the Web interface with the OPUS system, it's come a long way since the introduction, I would say, about eight years ago, when we first started seeing it, and it has become a very user-friendly but there's still some improvements that can be made, particularly with the static, static calculations.

And then continue your leadership in

developing guidelines for programs such as the real-time networks. Just recently I attended a seminar at the Maryland Society of Surveyors' fall conference where Bill Henning unveiled his draft for guidelines for the MGN. What that does, that helps all of the surveyors work on the same page. They're all using the same methodology. So, in closing, I would like to say that we greatly benefit from NOAA's services and particularly NGS and we look forward to continued funding and continued enhancement of those services. Thank you.

(Applause)

MR. SKINNER: I know we're hitting the hot buttons for this panel from the violence to the importance of the Port of Baltimore and also the technical aspects, so, thank you all very much. And now we're moving onto a private sector perspective which has also been very important to this panel.

MR. FITZGIBBON: Thank you. Good morning. My name is Stu FitzGibbon. I'm an environment manager at the Domino Sugar Refinery, which actually is a

member the American Sugar Refining Company. And, before I start I would like to preface this by saying, you should consider this as an example of the private sector. We are one of many users of the waters of United States for the purpose of manufacturing products. And, I'm just one of many, so, hopefully you see it from a larger scope than just Domino.

You're also familiar with the economic can sign. A couple of facts, this refinery here is the second largest refinery in North America. We make 6.1 million pounds of sugar per day, also one of the busiest bulk marine discharge terminals, bringing in, we usually have a ship alongside and we're bringing in a ship about every seven to ten days.

Just like the port has to put it's numbers up, I'm a member of the private sector so I have to say this. Just this plant alone provides jobs funding about $80 million a year. We subcontract about $12 million a year. And one thing that's of critical importance is this issue of the infrastructure because manufacturing across the world and especially in North

America is interdependent. Hershey Foods, General Foods, all the big food manufacturers that you're familiar with are dependent on somebody supplying them with raw materials and one of their largest ingredients is sugar. Should sugar go away for one reason or another there would be a waterfall effect and a multitude of other facilities would suffer the consequences. So it's very much a Swiss cheese effect where at some point without manufacturing, these jobs all leave North America.

Interesting facts, these are unionized jobs. The average wage before fringes is $57,000 a year. We add a significant amount to that, that's $80,000 a year, these folks are blue collar workers, high school education. Without this type of job they'd be earning 25, $30,000 without fringes. Professional staff, we have engineers, people like myself with no other way to earn a living and they're pulling in a hundred thousand a year.

Another thing I think you should understand about manufacturing is we have direct jobs and induced

jobs. The typical ratio for a manufacturer is that for every one job you are creating two and a half other jobs, pilots, for instance, and, we have subcontractors, we have other manufacturers to depend upon. It's a very real fact. One of the questions I always get asked is, well, how many employees do you have? I get into this speech every time. Because we only have 500 employees but we're creating over 1200 jobs.

This is how we receive our raw material and this sort of leads me into the developed piece of the equation, big bulk carriers with raw sugar and we also discharge with cranes and that brings us into water and the air issues. This is our raw material. It's produced anywhere across the globe. That's raw sugar we're receiving in vessels that are 50 million pounds. And, it's a bulk chemical; it's not a food.

So, for water, we use water in a multitude of ways and what is important to us is the temperature of the water and, of course, the tide. Water temperature, we're a citizen of the environment and we

don't want to do bad things to the environment and we have restrictions on how we can operate. And for an example, this plant here processes, recirculates 30,000 gallons a minute of bay water.

So, millions of gallons of water are circulating through the plant. We don't add any ingredient to it but we do increase the temperature of that water through the process. And we are not allowed to discharge above 95 degrees Fahrenheit, which at times can be problematic because the bay itself in the summer exceeds 95 degrees Fahrenheit. So we carefully monitor that but also in the sugar refining process we're using bay water to do evaporation, we create vacuum and the temperature of bay water can affect that.

So here's an example of one of your products that we use. We are very interested in water temperature, not so much air temperature but water temperature because of our constraints on operations and we will shut the refinery down in the event that it looks to us like the water temperature is going to

become unworkable. That might seem like a minor decision but at $10,000 an hour it's a big deal.

Furthermore, we have to be able to predict this. A facility like ours has a 16 to 24 hour momentum to it so should we decide to shut the plant down it's going to be 16 to 24 hours before we can actually accomplish that. We monitor the bay water temperatures with our own instrumentation, and one of the problems is instrumentation goes bad, as I'm sure you're all well aware, and we need to validate our data and we do that with your charts. And three's been many a night at 2 o'clock in the morning on the phone with the foreman telling him you need to go on the Internet to the following site because before we shut the plant down we need to know that our instruments are right.

Water level is an interesting issue for us. Obviously, as Captain Nielsen commented, the vessel transport issues are large and just like any other port facility, we're very interested in draft and we assume the pilots can get them to us and we have good success there. The other issue is that water levels can affect

our operation because if the tide or water level is extremely low, we have to shut the plant down because there's not enough water to bring into the plant. I'll talk a little bit further about that in a minute.

And also storm surges, and I don't know how many of you are familiar with the Isabel event here but Hurricane Isabel was an unusual confluence of tides and winds. And, again, if we had been a little bit better at seeing that coming it would have not had as much consequences to our facility. And as it happened we were done for almost four days. It's a very high cost.

So, you've already seen this chart once. This is something that I look at very carefully when the need arises. We also accept vessels at times that will potentially block our discharge points where we are recirculating water to the bay, and we don't want to have that happen so we will choose to receive a vessel at high water levels. And then, of course, there's the issue of not being able to see the vessel in, because of water levels.

Let's talk a little bit about air and wind.

These are cranes. I don't have a better picture, unfortunately, but cranes are wind-dependent. We can't operate them above 35 or 45 miles an hour depending on the crane. It's a safety issue. And, we often get into wind speed discussions. Again, we have our own wind speed monitors which are trended but we also use NOAA's information to try to predict when we're going to have a wind event. Because, if you have a wind event and you're not prepared for it, you can't just shut a crane down and run down the stairs. You have to secure it and it's a very big deal. We had an event a couple years ago where we were unable to secure the crane in time and that caused $2 million worth of damage to the crane.

Wind direction at least in Baltimore Harbor can be a very interesting problem, because regardless of what you might predict for tides, the wind can make unusual things happen. You can have a predicted high tide where you actually have almost no water in the Inner Harbor because the wind is driving the water away from the harbor and you can have the opposite where in

the case of Hurricane Isabel, where we were predicting just a little bit above normal high tide but the wind drove the water into the bay and we had an extremely high tide. Both of these had dramatic effects on our operation.

I talked about that -- so, this is your current product that I use although I see there's another one I haven't seen. So, in terms of constructive feedback, imagine talking with a high school graduate on the phone at 2 o'clock in the morning and saying to them, "Well, what are you expecting to happen with the water?" "What direction is the wind coming in?" Well, they can't read stuff like this. They're not trained on that. And, you know, this is scientific terminology but you've got to recognize that some of the users of your products are not trained scientists.

So, feedback, you should know your users, which is what you're doing right here. More emphasis on predictive trends, if you go back to this, maybe there's products I'm not aware of but with a 16 to 24

hour momentum to the plant, it's hard to predict. The tide chart has a very good predictive element to it.

One thing I would like to see is, let's look at a particular point in time for history. I've had to go back several times and look, you know, at explanations that are given to me in the facility and look at the actuality of what happened at that point in time down to, you know, an hour or two.

And, finally, you're doing good stuff. It's very powerful for a facility like me, and I represent a multitude of users, nuclear power plants, there are multitude of other industrial concerns that are dependent on the import and export of materials through the ports. And I think you're doing a hell of a job. Thank you very much.

(Applause)

MR. SKINNER: Thank you. It's very interesting to see a large corporation using a whole suite of hydrographic data as you folks are at your facility. The panel has also been historically very interested in the relationship between or among NOAA

and its sister agencies so we're very fortunate to have both the Army Corps and the Coast Guard here today on this panel so thanks for being here.

MR. GOLDER: Good morning. My name is Steve Golder. I'm with the Corps of Engineers in Baltimore. And I'm the chief of the survey team. I put together some brief slides on what we do and why we use NOAA products. The survey team performs routine hydrographic surveys to monitor local rivers and waterway navigation conditions for federally authorized channels. The information is used as a decision-making tool for Baltimore Harbor, channel maintenance operations and planning, and along the Baltimore Harbor we use a lot of NOAA tidal stations and NOAA benchmarks. We depend on NOAA benchmarks basically. That's what we do.

And engineering type work we do, this is the River Fringes. We depend on NOAA benchmarks to complete projects like this. Baltimore District maintains a hundred projects in the Maryland portion of Chesapeake Bay tributaries and Potomac River, along the

Atlantic Coast of Maryland. There are two organizations. We have the shallow draft, which is five to fourteen feet below the water, and the most major project we have is the Wicomico River, which is 30 miles long. And we need NOAA's support put in some tidal stations along the '83 to '01 Tidal Epoch. And everybody knows the Baltimore Harbor, which is the deep draft. This is a kind of overview of what we do of different projects that we cover.

The structure of the survey team, basically the navigation division, the navigation branch underneath the operation division, we have three sections. We have the navigation section, we have the Baltimore Harbor section and we have the survey station. The navigation section has the project managers that run all the programs.

The Baltimore Harbor has project managers that just deal with Baltimore Harbor and then the survey team deals with the condition surveys and whatever the project managers want us to do. The way that we're structured is the survey team receives

funding for condition surveys and the project manager gives the survey team funding for dredging projects. Most of the data is collected using Hypack, Bentley Microstation XM software and we use Inroads to put the data on the charts.

The deep draft, basically collect data using the DGPS Odem depth sounder, Odem velocity profiler, PODS-MV, the calibration bar and manual tides. This is the deep draft boat which is The Linthicum; the shallow draft boats, the same thing, DGPS unit, Odem depth sounder, sound velocity profiler, calibration bar and manual tides. This is the Hydro I, which is our spare boat that we send out when we need it. This is Hydro II. This boat right here travels 40 to 45 weeks out of the year down on the small projects. As you can see this has the POD-MV on it and it has a GeoSwath system in it so we can do multi-survey if needed.

Okay. The NOAA products, all federally maintained channels are surveyed to mean lower low water for the '83 to 2001 Tidal Epoch and like I say,

we used NOAA's published data. Most benchmarks used come from NOAA's tidal benchmark database. Okay. Projects that are without the '83 to '01 Tidal Epoch, we basically do two four-hour sessions and we send it through OPUS. we get a coordinate and we use V-DATUM. V-DATUM helps out a lot. This is the Website that we have and, if you want to get the data down, you can go to the Corps Website and pull down the information.

The future improvements, the first one, Baltimore Harbor is, Baltimore District is working to get NOAA's products in a timely manner. The problem that we have is like right now is Baltimore Harbor making its contract. So that's the focus of the deep draft boat and the focus of the processing, is Baltimore Harbor. The project costs about 15 to $20 million and it takes us until June to get everything finalized.

Actually, the survey has at least 85 percent of Baltimore Harbor surveyed right now but because the focus is on the maintenance dredging, that's the focus. So around August we normally process

the rest of the data and publish it on the Website and let NOAA know that it's on the Website so they can pull it down.

The District is looking to update its survey vessel, The Linthicum. It's scheduled to have a new survey boat by 2012. We're looking at the new Bay Hydrographer, that type of boat. The Baltimore District is planning to participate in NOAA's training. We found out this year that NOAA does training around February and March timeframe. And we had an invitation. We couldn't make it but we're hoping to make it in the future.

Like I say, we are upgrading now our equipment. We're looking to get some better GPS receivers and we're looking to get a 200 kilohertz multibeam system. On The Linthicum right now we have a 8125, which is a 455 kilohertz. We cannot use it for dredging purposes so that's why we have to stick to the single-beam. Now, for condition surveys we will use it for conditions but not for multibeam, I mean not for contract work.

Okay. NOAA products, like I say, V-DATUM is a plus for us. It really is a plus for us. The tide gauges, like I say, we can use a couple of tide gauges along the Wicomico River, which is a 30 mile project. And we would like NOAA to keep updating its tidal benchmarks.

This is Poplar Island, one of the major projects out there that the dredged material is going through. And basically the Baltimore District has cooperated with NOAA on two efforts at Poplar Island, establishments of tidal datum the project, after NOAA, after our North Atlantic Operations Section folks assisted with the calibrations, gauging tidal bay equipment and showed us some of the new installation procedures the Corps installed, the tide gauge at Poplar Island, and how it got a company do a tidal study on it. And the second one was establish sedimentation erosion tables in Cell 3. And that's it. Thank you.

(Applause)

MR. SKINNER: Thank you. Sounds like

Baltimore keeps the Corps fairly busy. And, it's nice to see another agency using so much of NOAA's data and also thank you for those specific recommendations. Moving on, one of the topics in the Most Wanted report that this panel produced included a section on other uses of hydrographic data. So, David we're looking forward to your remarks.

MR. NEMERSON: Thank you very much and thanks for inviting me. I'm David Nemerson. I'm a conservation biologist at the National Aquarium. So yeah, I'm one of sort of the nontraditional users of NOAA data. That makes me the guy in the room without the necktie.

So, frequently when I use these kind of things I'm asked, what's an aquarium doing here? And even more so, you know, in this particular setting. But we like to think that we are a lot more of an organization than just people coming into the building and looking, you know, at our exhibits, and looking at fish behind the glass.

A lot of what we try and do is create

programs that go beyond the laws of the Aquarium. This is our mission statement. By connecting people with aquatic life we make a better world for both. We certainly try and make that connection when people come into the building but we also -- and this is really what I do with the Aquarium, try and create programs to get people out of the building and really get them connected to aquatic life.

And this is actually out on Poplar Island, which you've already heard about a couple times today, and these are community volunteers doing a large community-based wetland planting event out on Poplar Island. These are great events that get people out into the bay, and get them muddy and sort of get them experienced in different habitats around the bay firsthand.

So, as I said, you know, the main focus of our programs are community-based wetland restorations. We find it's a great tool to get large numbers of the public out into bay habitats and get them excited and energized about bay restoration and preservation work.

A lot of what we do, we worked with Frank on and other partners, which is getting rid of this 5 million cubic yards of material that needs to be dredged out of the approach channels every year. And a lot of what we do is try and find beneficial uses of that. And a great use of dredged material is marsh restoration and marsh creation. So, a lot of our projects do take place on beneficially-placed dredged material.

This is what one of our smaller projects might look like. This is out on Eastern Neck Island, which is part of the National Wildlife Refuge System. These are segmented breakwaters that were actually placed offshore for erosion control purposes back here on the bank and were later identified as a place for beneficial use of a dredged material placement. So this is what our sites look like before we bring our community volunteers out to plant them. And that's fresh dredged material placed behind these segmented breakwaters.

We do these kind of projects up and down the Chesapeake Bay, from the mouth of the bay up to the

Baltimore area. We work quite a bit out at Blackwater National Wildlife Refuge, which in this sequential area you can see has lost an enormous amount, the latest estimate, I think about eight or 9,000 acres of tidal wetlands. And I'll kind of get to that problem in a minute.

We're pretty successful at doing these projects. Each one of these in here is an individually hand-planted sprig of native marsh grass, Spartina alterniflora, planted in May of the year -- this was 2003 -- out at Blackwater. And that's just what, four months later, after the grasses grow up, they get real lush really quick and they do very, very well.

As I said, we worked out on Poplar Island. This is another site. Actually, you had a picture of this before out on Poplar Island. Again you can see the individual hand-planted sprigs of Spartina grass. We planted 171,000 of those plants out across six acres of this site. And a couple months later, you know, that's what it looks like.

We worked out on Barren Island, which is

another island out the mid-bay, another National Wildlife Refuge site. And over the years this island was eroding badly, putting sea-grass beds in its lee and putting development back here on the mainland in its lee at risk. We've worked with the Army Corps and Fish and Wildlife Service to restore about twenty acres and we're going to be out planting in this area in May of this year. So, you know, we're pretty successful at getting these sites planted, working with our partners to get the material placed and getting them green and growing.

But the main thing that I'm interested in from a scientific perspective, you know, are we really accomplishing our mission when we just show that they're green and growing? And that's where what I call the Three Rules of Marsh Real Estate come into play, and they are elevation, elevation, elevation. And that's where you guys come into play. That's, all the processes that go on out here in a salt marsh are controlled by these variables. The height of the marsh and the height of the tide controls how much inundation

there is. And certainly in a global sea-level change environment these are, relative elevation is a changing number that we need to keep our finger on. So, who are you going to call if that's what you need to do? Again it's you guys.

We work a lot with NGS and with NOS because we have land elevation, we have tide height; bring those two together and we can start asking the questions we need to answer about how these marshes are performing and again in a sea level rise context what their sustainability is in the long-term.

This is just a little example of, again, this is out at Eastern Neck Island. These are the segmented breakwaters. Dredged material was placed down in the southern end, and we worked with NGS to do a really detailed RTK survey of this site and produced this really nice digital elevation model which was done with RTK by NGS folks, create the digital elevation model. That enables you to then have really nice planting guidance as to what species to put out here, because we have a sense of what species thrive at what

elevations.

So, we know that when they place the dredged material here they want to hit their targets but to get actual detailed digital elevation model, post-material placement allows us to map out our plantings much more accurately on site and then that provides a monitoring baseline that if we can come out and do repeated surveys, we get a much better sense rather than just green and growing but where are these things living in the tide range, which is the key variable on whether they're going to be sustainable in the long-term.

This is just a handout that I made for our volunteers at that time and just that's sort of the DEM overlaid over other digital photo, you know, courtesy of NOAA. NGS, that's just a, one, different way that we use our products just to kind of inform our, use your products to inform our volunteers about where they are and what they're doing.

So, you know, really this is a slide that just brings it all together, all these different

products that mainly, you know, live in NOS and NGS, and again our tide height elevation and most importantly real-time change in those parameters over time. And, to tie those all into a common vertical reference system is key to the kind of work that we do.

And this is just a little cartoon, actually, that someone at NGS put together that shows these kind of ideas of what the level of tide is, where wetland elevation is. We use something called a sediment elevation table which gives very accurate but very spatially restricted information about marsh surface elevation and the change in that variable as well. And these animations are really pushing the system to the limit. Sorry about that. There we go.

So we have subsidence that we have to deal with, sea level rise and when we can tie that all together in a common vertical datum we can really get to understand these processes tat are going on that are driving where elevation is, what inundation frequencies are and how they're changing over time.

Another thing that we have worked with NGS

on is spatially -- vegetation surveys. That's how we place the quadrat but then we can nail it down in X, Y and Z. And that's Galen Scott from NGS doing an RTK survey of these vegetation quadrats. And then we can create our digital elevation models of our site and kind of overlay -- this is a marsh grass species -- overlay the density of these species on the elevation to really get a clear sense of how these processes are working out on these sites.

This is another thing that I have been playing around with that NGS has helped me to kind of bringing to the next level, which is kind of home-grown aerial photography, using this little helium balloon. It's a five foot diameter helium balloon from which, an off-the-shelf digital camera hangs, and you can send that thing up about 100 to 200 meters above the marsh. This is a commercial airplane-based aerial photograph and this is one taken with this low-altitude balloon.

And just looking at those two blowups of that, the pixel density is, about four pixels per meter squared on commercial aerial photography and on this

home-grown method we can get 260 pixels per meter squared. These are just little actually pieces of aluminum roof flashing that we put out and post in the marsh, RTK those in, and then we can locate them in, you know, in a GIS and ARC view, and that enables you to then overlay those photos very accurately and look over time how sites are changing. So that's 2005 and 2008. That's out at Blackwater National Wildlife Refuge and that's just three years of erosion on this one, this one little site.

So, you know, in summary this is the group that I work mostly with, which is kind of a collaboration of NGS and CO-OPS, Coastal Program. And to me it's a perfect public-private partnership. The National Aquarium, it's a stand-alone, nonprofit organization. We're not a public organization in any way. We're just a stand-alone NGO. So this collaboration between us and NOAA to me is a great public-private partnership, engages nontraditional partners.

And, you've heard from sort of the much

more traditional users of your products but this is to me a great program. It's bringing in, you know, sort of the wetland restoration community and restoration practitioners into the great data that you have available. It gets your technology and data out to a whole new suite of end users, and probably with the new administrator I think that will be even, you know, even more important to get that out to sort of the restoration and coastal, environmental management community.

One thing that NGS and CO-OPS has been doing is to try and write these methods up into sets of reliable standards that can be rolled out by different practitioners around coastal sites around the country. And, for example, all of the National Ocean Research Reserve sites are now starting to kind of tie into this methodology and do this kind of work in a coordinated way with reliable standards.

Just, you have seen these graphs a bunch of time. I use these all the time. And when you are taking 150 volunteers out to a site and want to be

planting marsh grasses, you need to know what the current state of the tide is and what it's going to do. Just one little thing about this is -- I don't know, and this is more of a technical question. I'd love to see the sort of duty cycle on this be faster, that it gets updated more than twice a day.

It often seems like I should have picked one where the prediction and the actual level were way off because frequently there's not much of a match and you're wondering why the system can't update itself and start making better future predictions knowing that the nowcast isn't meeting the current stat of tide. So that's just one little small suggestion. I think that's all I have. Thanks for the opportunity to address the panel.

(Applause)

MR. SKINNER: Thanks, David. I think we used the Fort McHenry restoration project in our report as an example. I saw it up on your screen.

MR. NEMERSON: Yeah, I did.

MR. SKINNER: And with $270 million

available now through NOAA for habitat restoration projects you may see a lot more use of this hydrographic data for these type of projects.

MR. NEMERSON: I hope so.

MR. SKINNER: Captain Kelly?

CAPTAIN KELLY: Good morning. First of all, thanks to the sound guy over here. You all sound great this morning. And, I've declared myself a PowerPoint Free Zone. I'm here to represent your United States Coast Guard, the 300 active duty, 200 reservists and 1500 Coast Guard auxiliary volunteers that operate here in the Northern Chesapeake Bay and over in the Potomac River and all the tributaries in the area.

I got a couple of different roles here. If you're not familiar with the Coast Guard and what we call now sectors, the sectors are a combination of your traditional Coast Guard group that dealt with search-and-rescue and law enforcement and aids to navigation, et cetera, and the Coast Guard Marine Safety Office for the Captain of the Port in any

particular region.

We went through a little bit of a consolidation over the last five years and we took these separate entities and we tried to create one captain, one face in the port. Before there was quite often a lot of confusion with regard to who do I go to for any particular role.

But, I can tell you that in combining the roles, it really has done a lot for us to take the role of the Captain of the Port with the federal on-scene coordinator or the Federal Maritime Security coordinator or the officer in charge of marine inspection or add whatever other hats that I may have to wear from time to time and put them all in one shop because it has made our business a lot more effective.

And I believe that it's been, it has enhanced our ability to collaborate. Because, in addition to our traditional Coast Guard missions in the area, I fancy myself as a regional collaborator, that my job is to make sure that we're working nicely with all of our federal, state, local and private sector

partners, that we don't get it all done by ourselves, that each one of our entities, whether you're government or whether you're private sector, carries with it a particular set of authorities or capabilities or competencies but you all form together, you all join together to form a partnership. And what we do when we do that is we create capacity.

So that we have a whole lot of things going on here, in particular, in the northern Chesapeake Bay, it's a very diverse operating area. You've already heard talk about liquefied natural gas facilities. We've got a nuclear power plant right on the water. We got our nation's largest estuary here with the Chesapeake Bay. We got $36 billion a year in product flowing through the port. So there's a lot going on. And then to complicate things also, on the Potomac River we also have this thing called the National Capital Region, which I fondly refer to as The Giant Black Hole, into which all my attention and effort is quite often drawn.

My job is to balance all this from the

terms of safety and security and stewardship. At any given point in my three, nearly three years here, it's been a challenge to balance the three together. And the way that we do that is by managing risk. There is no time when I'm making a unilateral decision. In particular, Captain Nielsen can tell you that through our Area Maritime Security Committee when things happen in a port or when things may happen in a port, it's quite often that I join with my fellow members of the committee to make a decision as to what we're going to do because I want to know what the impacts are.

And that's where NOAA and the information that you are able to provide to us is so beneficial for us, not only in reacting and responding to cases or operations but also in planning, to get into the planning phase. Because, in managing risk we're not just looking at the incident itself but we're also looking at our people.

And quite often when we have to put our Coast Guard and our Coast Guard members out into harm's way, it's your products that help us go through the

operational risk management, leading into the decision, the ultimate decision on whether we're going to go or not. So, it's incredibly important to sustain that level of service to the port community.

I talked a little bit about operations and I have come to conclude having been in my job previous to this tour, where I ran the Coast Guard's Command Center in Washington, and now in this job, that you may have been familiar with the book, The World is Flat, where the author, Mr. Freedman, Dr. Freedman, describes the fact that you could be sitting either right here in the hotel with your wireless connection or you could be with a wireless card in your laptop sitting over in the Serengeti in Africa and still have access to the same type of information.

Well, the world is indeed flat. I want to tell you now, operations are flat as well and that you will see at any given time on a tour of a Coast Guard Command Center, whether it's here in Baltimore or in Washington, D.C., or San Francisco, California, the one common theme throughout all the Command Centers is that

there are graphic displays. Most of them are CNN but on top of that it's graphic displays. Because, a lot of our operation is information, and building public confidence through information, graphic information, is what is extremely, extremely important, not only public confidence but also the confidence of our leadership.

I don't know how many of you here don't have a boss but I know my boss in particular and his confidence is high when I'm able to tell him that I feel good about an operation because our folks are organized and they're trained and they're equipped. And when I say equipped I don't necessarily mean all of the personal protective equipment that they're wearing to go out on a mission but also with the knowledge of what they can expect to encounter. And so much of what that knowledge set involves includes information that we get through NOAA.

You heard Captain Nielsen and Mr. Hamons already talk about the various products and the rest of the panel talk about the products that we can find online. Thank God for the Internet. And, if I can

give you all a virtual hug of thanks, there it is. Because, we just don't get it done as efficiently or as effectively without the information that you provide.

But it's not just the products that you see online or in paper, in the charts, but it's also the services that we receive, anything from post-hurricane surveys all the way through to hazardous navigation reports, while out doing surveys and finding hazardous navigation that the information is shared with us, the Coast Guard, so that we can put those broadcast notices to the mariners out there so that the pilots and our recreational boating public and any type of operators out there in the water are able to capitalize on that information to avoid any type of incident. And that's when I take a personal stake because a lot of time when it's an incident, that's when I get the phone call in the middle of the night. So I certainly appreciate that.

And then also, again, touching base with the people side, there are folks from NOAA that participate in our waterways analysis on management

system and certainly that expertise that you're able to share with us goes a long way toward our success.

A couple of examples where we really rely on your information, I already mentioned post-hurricane surveys. The natural tendency for us after a heavy-weather event is, first of all, to check the channels, to make sure that they are clear and that they are also, that they remain at their charted depths because we know, again, I mentioned, a hundred million dollars a day, $36 billion in a year that we need to open things up as soon as we can following any type of event.

In the case of a natural event, we got to get the channels open again. We got to certify that they're open again so we can get the traffic moving because in these times of just-in-time inventories it doesn't take very long between closing a channel, closing a port and the Target shelves in Ottumwa, Iowa are starting to go bare. So, it's incredibly important to have your partnership in resolving that.

Another example that I like to use is the

Eastern Shore of Maryland, which is the Delmarva Peninsula, Delaware, Maryland, Virginia, which the folks over there told me that it's not really an island anymore -- I'm sorry, it's not a peninsula, that we made it an island by cutting the C&D canal across the top. So when you look at that, there's only a few ways to get on the island by vehicle. You've got the Bay Bridge Tunnel, you've got the Chesapeake Bay Bridge, and then you've got a couple of ways to go across, up across the C&D Canal for the Cape May-Lewis Ferry. So our highways are limited.

I also learned over the course of, I learned early in my tour that over there they've got themselves about a three to five day inventory of home heating oil so that in the wintertime it's pretty important that they keep this flow of home heating oil into the area.

Now, you can compare the volume in a million gallon barge to the volume of a 5,000 gallon tanker truck and it doesn't take but simple math to realize that one barge equals about 200 of those tanker

trucks. That's a whole lot of traffic on the road. Well, why do I bring this up? Well, first of all, I don't have any ice-breaking capability here in the Chesapeake Bay but my icebreakers come from down south. This is kind of weird.

My icebreakers come from down south but it takes a while to get them there so that I use the information, for example, water temperature, to make our own predictions with regard to ice formation and thickness, et cetera, and location, so that I can position, preposition ice breakers so that we can keep the channels open, keep the rivers open so that we can keep the product flowing.

So two quick examples. And then there's two things that I want to leave with you as far as how you can help us further. Number one is continue your innovation in providing the products and services, that I know your attention -- and this is a great example -- to the needs of your customers, your stakeholders, your shareholders has got to be at the forefront of that innovation. And the products that you are providing

must continue to provide timely, accurate and meaningful data. So thank you for that.

And then the other thing that I'm going to leave you with is probably something that you have never heard. Learn the Incident Command System. If you haven't done it, you need to know that every time there's a contingency in this Captain of the Port's zone, we establish a unified command. Am I right, Eric, or am I right, Eric?

CAPTAIN NIELSON: You are right.

CAPTAIN KELLY: And to go into a unified command as a representative of your organization or to serve as part of the unified command, it's good to know in advance of the roles within the command structure, to be able to talk ICS, to be able to understand the National Incident Management System, because it's very important to step into those organizations with knowledge aforethought of what your role is and what function that you can serve.

And it's very easy. It's a matter of going to a FEMA Website and taking a couple of

introductory-level courses, and that's probably all you need but by learning ICS, when we need you probably the most in a contingency is going to be in a unified command position. So, thanks a lot for your attention -- sound guy, way to go -- and I'll be available as well as the other panelists to answer your questions now.

(Applause)

MR. SKINNER: Thank you, Captain Kelly. The panel, as I noted earlier, is very interested in how hydrographic data is used by local, state and federal agencies and the Coast Guard is certainly one of the larger users. We note that your point about knowing more about the Coast Guard and how it's organized and what its mission is and so forth is also very important. At our July meeting we had a presentation that resulted in a recommendation to cooperate more fully in the Arctic areas. So we take that very, very seriously and thank you for your comments.

I also want to note the panel notes your

virtual hug and returns the sentiment so thank you very much. Panel, we're open for questions and discussion. But before that, just would like to note that panel member, former panel member -- what do they call college professors that retire? Emeritus, Panel Member Emeritus John Oswald is with us. He says he's here to set everything that Larry has been saying about Alaska straight later on today. So we look forward to that. Welcome, John. Sorry, Larry.

MR. WHITING: Yeah, may I ask a question? I'm Larry Whiting. You guys put up a problem that NOAA and the Corps of Engineers have, that's that they survey to different standards. The Corps of Engineers is looking for the bottom; the NOAA is looking for the top. And, there are a couple of tints in their rounding that they use that are different.

If NOAA had their way they would make this whole world shallower so that you wouldn't hit anything and you guys would be losing some of your drafts that you put in there. So, if you guys, Corps of Engineers and NOAA could get together on that survey standard of

just your rounding, you would be better off. And that's a Corps of Engineers problem also. You don't survey to the I'm lecturing you guys. I'm supposed to be asking questions. You guys need to get your multibeams out there. You need to fund those things.

Now, the easiest way to do that, of course, is contracting quickly and you should do the contracting. I don't know if you using contractors here in the Chesapeake Bay or not. So, and I have one question for Keith Bailey. RLSs, are your hydrographic surveys required to be conducted under an RLS, a registered land surveyor.

MR. BAILEY: No, I don't believe so. Right now I believe ACSM offers a certified hydrographer program and I believe they work in concert with NOAA but I can't guarantee that, no.

MR. WHITING: Okay. Well, most of the states are going that way but I was just wondering if Maryland had.

MR. BAILEY: Not yet. We're dealing with photogrammetry first.

MR. WHITING: Okay.

MR. SZABADOS: Larry, I'd like to help out the Army Corps a little bit and give some information relevant to your question, comment, is that we, NOS, NGS and CO-OPS have been working with the Army Corps, and Army Corps is adopting NOAA's standards for surveying for geodetic and tidal datums and we're working with them to establish those standards and training mean guides with the Army Corps and they've mandated that for their coastal engineering projects. So it's a matter of implementation right now.

DR. JEFFRESS: Hi. This is Gary Jeffress. And this a question for Steve. I did see in your presentation that the datum you used for dredging in Chesapeake Bay is the mean lower low water on the 2001 Epoch, is that correct? Great.

MR. GOLDER: '83 to '01, yes, sir.

DR. JEFFRESS: Okay. I'm actually at the moment doing a study for the Corps of Engineers, looking at vertical datums and elevation accuracies and I've been to visit about seven different districts and

you're the only one that I know of that's using that datum. Down in the Gulf Coast, particularly in New Orleans they're using the datum that was established in 1911, called the mean low gulf, and it's about two and a half feet lower than mean lower level water right now.

MR. GOLDER: Yes, sir.

DR. JEFFRESS: Thanks.

MR. GOLDER: Yes, sir.

ADMIRAL WEST: Dick West. I think Eric or Frank, you both mentioned that you used paper charts as, you kind of inferred that they were backups. Why do you do that; why don't you just get rid of paper charts?

MR. HAMONS: I'm sorry?

ADMIRAL WEST: Why do you keep paper charts?

MR. FRANK: Why do we use them? We use electronic charts also. We actually, when you're doing most of, I just, use an example up here, that we have some paper charts. We use them for displays and we use

them for demonstrations, and that sort of thing, but when we're doing calculations, that sort of thing, we do it all electronically.

CAPTAIN NIELSON: We find that the paper charts, particularly the one we have for Baltimore Harbor, we can see the whole harbor and get it in your mind's eye how everything is related to each other, rather than the screen shots that you see electronically. Now, I guess that can be changed if you had a three foot by three foot monitor. It's a little impractical for our uses. And similarly, a lot of pilots still carry paper charts up and down the bay with them because the electronics fail and the paper charts never fail.

ADMIRAL WEST: They go over the side. No, it's kind of an interesting thing because it's one of the things tried to do in the Navy was to go pure, you know, electronic charts. There's always the stigma of, oh, I got to have a backup. But what it does is hugely efficient, gets rid of a lot of folks in the system that must maintain paper charts.

And, so, that's kind of why the Navy pushed it. But it's sort of like why people like to read the paper instead of, what, reading the paper on a, you know, computer screen, it's just you like to see the -- but it's going away. I mean, papers are folding up right and left right now so we're eventually going to go to that. It's interesting that I was on a group in the Pentagon in the early nineties that said we're going to make the Pentagon paperless by the year 2000. I'll leave it at that.

MR. SKINNER: Jon?

MR. DASSLER: Yeah, you know, Frank, you pointed out the issues with getting surveys that the port does and get that onto nautical charts. And I was curious a little bit about specifications you have on surveys and if that's done by hydrographers, certified hydrographers or some of the issues there. I notice that Captain Nielsen also pointed out that there was a lot of obstructions found.

You know, granted some of the data is a hundred years old but with modern technologies a lot of

obstructions are being found. So some of those are being located by contract surveyors with NOAA, so some of those same contractors are doing surveys for port authorities and for the Corps of Engineers. But I was just curious about that. And would it be helpful if NOAA provided specifications and guidelines to port authorities so they could do surveys of those standards to get onto nautical charts?

MR. HAMONS: Yes, I think it would. Very frequently when ports are responding to something, we're usually responding because we have some kind of pressure from one of our customers who are in an intensely competitive business. So we're always pushing people to give us an answer as quickly as possible. And, people get kind of used to that, I guess, and they're looking at us, saying, okay, it's the port and they're always in a hurry.

But, at the same time the more we can coordinate ahead of time and set up that kind of an arrangement, yes, that would be very helpful to us, which you suggested, because we use surveyors who do

survey for NOAA in various other places and we had good surveys here.

And, you know, we had surveyed this job intensely, actually, the whole time it was going on, and, had all kinds of good data, very detailed, very, data of the bottom here, and, we had to wait until the Corps could came in and verify it, basically, which is what they did. And, you know, and it was, the only problem was that Corps was busy and we couldn't get them in.

And, it turned out they did verify the data that we had and we worked it out but we lost three months at that point in time and a certain amount of cargo. There was a certain amount of tonnage that didn't come across the the docks that could have come across the docks because the contractor, I mean the customer would not come in with ships drawing about three more feet of water until NOAA certified the fact that the depth was there. That's basically what it amounted to. So, anything that we could do to cut down on that kind of delay would be very useful and all of

our surveyors, I think, would be happy to cooperate in any way to make that possible.

CAPTAIN NIELSON: Similarly we find conflicts between a private terminal's contractor who surveyed and the NOAA survey of the same area. And it could be a couple feet. And it is a matter of measuring the bottom versus the top --

MR. HAMONS: Yeah.

CAPTAIN NIELSON: -- but the terminal wants to use the bottom and frankly at least in Baltimore we find that using the bottom works all right for handling ships with the clears that we need, and, but it is a frustrating situation to have a NOAA survey show less water than we're bringing in for the draft of the ship. Those standards would resolve a lot of that.

MR. DASSLER: I think it just really puts an emphasis on standards. I mean, it probably even goes back to Roger Parson's effort on the Integrated Ocean and Coastal Mapping and how some of this data, if more, if there are standards that are set even for private terminals for doing surveys and that data can

get used to get on the charts. And I guess the next question is for Steve, is, because I think we have submitted surveys before, too, when we've done them for private entities or port authorities that get onto the charts. So that's not out of the realm, is it, now?

CAPTAIN BARNUM: I think the big question is -- Steve Barnum, Coast Surgery. Certainly with surveys of the Army Corps of Engineers' channels, since the Army Corps is the authority of the channel they're responsible for providing updates to that channel to NOAA and then we apply it to the nautical chart.

That said, we've moved towards the Ocean and Coastal Mapping, the recent passing of the bill, Ocean and Coastal Mapping for Integration and making best use of public resources for surveying. We should move towards a standard of which we can survey channels and berths to a common standard and understanding so it can be universally applied so that we understand the type of data that we're receiving so that we can then with good confidence apply it to the chart.

DR. JEFFRESS: Gary Jeffress, this is a

question for Keith. Keith, I'm a surveyor, too, a long time ago but licensed and I'm licensed in Texas. And I'm from Texas even though it doesn't sound like it. We have a lot of problems in Texas with surveyors issuing elevation certificates, particularly along the coast. We have subsidence going on. We have sea level rise going on and discrepancies between datums that were reported on these FEMA flight elevation certificates, the differences between the NGVD29 and 88 and what other, is the other category they have; do you have that same problem in Maryland?

MR. BAILEY: Well, as long as there's a published standard for the elevation certificate, I don't see an issue; however, unless benchmarks have been updated or superseded, you know, there could be a potential issue. Honestly, that's not a service that I perform professionally. The elevation certificates, you find those, I find a lot of those on the Eastern Shore required although there are some obviously in the coastal areas. But, as long as the standards are in place and the benchmarks are there, I don't really see

that as being an issue.

MR. WELCH: This is Ed Welch. Mr. Hamons, did I understand you correctly that the Maryland Port Authorities is a cosponsor or the local sponsor of Chesapeake Bay ports?

MR. HAMONS: Yes, we're the local sponsor.

MR. WELCH: How do you, what's the annual funding for it and how do you derive that funding?

MR. HAMONS: Well, all of the Maryland Port Administration's funding comes from the Transportation Trust Fund of Maryland. We are part of the Department of Transportation, Maryland Department of Transportation. So, all of our funding comes through there. It's a matter of my being able to justify this in terms of benefit to the port. And being an inland port, being a 150 nautical miles from the ocean and having 70 miles of dredged channel between us and the Atlantic Ocean, if you're going up and down the bay, we needed a system to enable us, and knowing that you've got virtually freshwater, you've got brackish water up here.

So you have a different density and then the seawater down at the mouth, depending on which way you're going, you know, and when you're sailing within two, two and a half feet of the bottom, if you're going to be able to a maximize your efficiency in a system like that with that kind of a range of possibility, you needed some system, some way to be able to get real-time data, when you were sitting at one end or the other, it didn't matter, real-time data throughout the system and to make projections as to what it was going to be like when you got there. And ports, it was just perfect.

I mean, we sat down and talked to NOAA about this and we actually had some shipping companies, shipping lines, asking us about it because it actually is a sales point for us, to be able to say that using the port system, you can travel safely, maximizing the channel, you know, getting, if you look out there and you know it's hard to imagine when you look and see a ship sailing up the bay, that it's this close to the bottom but when you send a dredged channel, and all,

those 70 miles, some of them are that close to the bottom, during that 70 miles.

Being able, well, number one, we have to maintain the channel scrupulously. Number two, given the different conditions that can cause ship roll, and a degree of ship roll makes a hell a lot of difference if it's a wide ship, and how close it's going to come to the bottom. It became a matter of really to keep us competitive with ports especially along the, that are closer, much closer to the ocean, that don't have this range of conditions to deal with. It didn't take me too long to convince our executive director we needed to have this so that we could get out there and offer and tell people, hey, we can get you in and out of here safely at maximum load. It was, you know, what can I say? The system, it's a good system. It works.

MR. WELCH: Then I take it from that, that the Maryland Ports Administration makes an annual request to the trust fund?

MR. HAMONS: Yes. Yes, we have an annual allocation that we paid for installation of it and we

paid whatever NOAA asks us for as far as annual O&M.

MR. WELCH: And do you have any rough idea as to how much that is?

MR. HAMONS: Well, that can range anywhere from, the last year or so we haven't had to pay that but it can range up to 250, 300,000 a year.

MR. SKINNER: Mike?

MR. SZABADOS: Last year it was funded as an earmark. This year -- as I'll get into my later presentation this afternoon -- there's federal funding this year, one time for funding also. And Maryland is included in that funding. The current O&M for Maryland ports is $375,000.

MR. WELCH: 375,000?

MR. SZABADOS: That's the current cost of the operations.

MR. WELCH: Mr. Hamons, on some of our other presentations at other locations some of the users or the sponsors have indicated enhancements to their local port systems that they would like to see. Are there things of that nature here that you would be

interested in?

MR. HAMONS: There are some. We would, I think in this case we would defer to the pilots. They're the users, you know, and so we usually go, we, in fact, a lot of the services that come from individual stations, individual buoys up and down the bay and that sort of thing, we sat down when it was installed and worked with the pilots as to what they felt they would need most in those particular areas. One of the things I think that I'm not sure we still have up and running in a couple of areas down there, the Bay Ridge, some of this visibility. And that's been, that's given us a bit of a problem that's important. Eric, if you -- so that's something that I'm not sure what the problem is, whether they had, with that particular service, but we didn't have it working well.

MR. WELCH: That's come up in other locations as well?

MR. HAMONS: Yes.

MR. WELCH: Mr. Golder, could you explain a

little bit for me, the locations that your survey vessels do compared to the locations that the Bay Hydrographer II do, is there an overlap into the type of channels and locations that they're doing surveys on or is there a clear delineation of work?

MR. GOLDER: Well, most of the time when a bay hydrographer come up into the bay, they do some of the terminal areas. They don't go into the main channel. As far as the tributaries, I haven't seen them down in the tributaries.

MR. WELCH: So it's your impression that we aren't sending two different agencies surveying the same places?

MR. GOLDER: No, sir.

MR. WELCH: Okay. Thank you. And, finally, Mr. FitsGibbon, I really appreciated your comments about how this has implications for the private sector. Just one comment. It's my impression that up on Capitol Hill, people who go up to Capitol Hill and talk about these NOAA programs and services tend to be the NOAA people that are doing the services

and they have all these nice documents about, you know, all their economic impacts and how they're serving different private sectors and sometimes Capitol Hill hears from ports authorities but they very, very seldom hear the type of presentation that you gave us. And, I would encourage you and your equivalents to detail exactly what you said to us in a one-page letter and send it to your Senators and your Congressmen here because they don't hear that type of thing and those types of letters make a tremendous difference. Thank you.

MR. FITZGIBBON: Thank you very much.

MR. WELCH: Thanks, Tom.

ADMIRAL WEST: For anybody on the panel, but maybe Frank from Port Planning and maybe David on how he plans his restoration, what do you use for sea level rise for the future and if you do, what source and what figure do you use?

MR. HAMONS: Up to this point we have not really been calculating sea level rise and what we've usually done when we're building one of our structures

is use, we go for the worst storm of record and basically build to that and that gives us such a buffer that most of the time sea level rise at the rate at which it's happening falls within, you know, the range of buffer that we would have there.

Now, it gets to be important when you're building wetlands and at this point in time that's a problem that we're dealing with. And I will tell you why, because we have criteria, when we are putting, such as in Poplar Island, we have criteria that say they want 80 percent low marsh and 20 percent high marsh. And the difference between low marsh and high marsh is a matter of a couple of millimeters. It isn't much. It's very, it's very close.

So the point becomes and one of the reasons why we're kind of struggling with this is, what do you want first? Because, as the sea level changes, you're going to, this condition is going to change because there is such a small tolerance. Basically, I think what we're doing in those endeavors is building for what we are likely to have over the next ten to twenty

years with the understanding that we may have to came back to modify it at some later date.

ADMIRAL WEST: But you don't have the specific figure?

MR. HAMONS: We do not at this point, no.

MR. NEMERSON: Yeah, I mean, I get asked that question a lot. And we don't have a specific figure, you know, to use, really. The number that people throw around the Chesapeake Bay is three and a half millimeters per year, but, as I, you know, made in my comments, to us relative sea level is, you know, is much more important than any kind of, you know, global absolute sea level rise. So we're very concerned on, you know, about subsidence on the Eastern Shore and what, and the change in land elevation versus tide height. But those numbers, you know, they're just, they're not really, you know, available yet in real-time.

ADMIRAL WEST: I think there's a huge problem here because of the insurance companies and the insurance business of insuring it. I'm involved with

another state's port planning and when you get down to a couple of feet there's a lot of emotion about whether that's available or not available, will it be or will it go away, et cetera, et cetera.

I think -- and this is probably a discussion we should have when Jack's here's tomorrow -- I think NOAA -- there were five ocean bills passed a couple weeks ago that Ashley sent to all of us, and I don't know if it's in there or it's in the Stimulus language that NOAA will be the federal agency to determine sea level rise for the future, I think. Does that ring a bell to anybody? I guess not. Maybe I was dreaming. But I think, I think NOAA is going to be challenged because they've been told to put together a climate service, et cetera, et cetera.

MR. SZABADOS: I believe that is, NOAA's planning that but I would like to answer one question regarding sea level in Baltimore. It's 3.08 millimeters per year.

ADMIRAL WEST: Well, you can argue with that.

MR. SZABADOS: Past hundred years, relative sea level.

ADMIRAL WEST: But, you know, there's one state using five feet. I've heard another state using one to three meters. I mean, it's all over the map and if you want to go and get these insurance companies and reinsurers to do something with your port, they're going to want to know what that is before they mess with it. And I do think that's been tasked to NOAA now and we may want to -- and the only reason why I bring it up with you folks here, it's obviously going to affect all the U.S., so, and that's a huge challenge for NOAA and I think it's part of this climate service thing that you have been tasked to do.

MR. McGOVERN: Thank you. Andrew McGovern. I have a quick if a quick question for Mr. Bailey. You mentioned a lot of services that you and your members can use from NOAA which will save you about 11 hours and 45 minutes of a 12 hour job. Do you know of anyone as we just were talking about the port system, is there any need for local sponsors, any payments, or is this

all provided; does the Society of Surveyors have to pay for any of these services or any, that you know of?

MR. BAILEY: The real-time kinematic networks or virtual reference systems that I referred to are put together by vendors, vendors, say Trimble, GPS products like TopCon, and yes, that's a subscription service that we all have to pay for.

MR. McGOVERN: I was just talking about any of the NOAA services. You talked about OPUS and CORS and the different Websites; is there any of that, that you have to pay for?

MR. BAILEY: No.

MR. McGOVERN: Okay.

MR. BAILEY: Yea.

MR. McGOVERN: Well, yeah. Unfortunately on the marine side we do have to pay.

MR. DASSLER: Again Jon Dassler. I guess just touching on the shorter term but a continuation of what Admiral West was talking about, but on a shorter duration I think a number of you touched on the need for nowcasts and forecasts and I just want to make sure

that we understand that. But I thought I heard a common theme from David and Stuart and even Captain Kelly on the need for better nowcasts and forecasts and trends in tidal data so as the wind changes the tide in the sea, you get astronomical predictions but what you would like to see is like more of a short-term three-day forecast.

For example, the Northwest River Forecast Center on the Columbia River, they'll view a short three-day forecast based on flows that are coming down and rainfall runoff, so there will be a three-day forecast and then beyond that they will do another five-day trend. So those get updated with each tidal update so you're seeing those trends. And if I understand that correctly, that's what you're asking for in terms of water level data in the Chesapeake.

MR. FITZGIBBON: Well, speaking for Domino, that would be wonderful but we would also like to be able to select time intervals. It might be a 24-hour period. It could be that we're expecting, for example, a wind event and we're not sure exactly what time the

winds will hit the Inner Harbor of Baltimore. So, it makes a difference between, you know, fifty to a hundred thousand dollars of expenditures on whether to operate or not and it would be tough to look at a five-day forecast and get it down to a discrimination of ten hours. So, it would be nice to be user-selectable. I would like to see from this time to that time this is what we're expecting to happen.

MR. DASSLER: Okay. I guess the systems I was talking about, they give you that continuous graph so you get that high frequency as you would with a normal tide but it extends out, say, three days and five days because it's hard to go much farther than that and have any kind of accuracy.

MR. FITZGIBBON: For Domino five days is a long period of time when we're operating hour-to-hour so I would like to be able to select anything three days or lower.

MR. SZABADOS: I would like to give an update about the modeling. Again, I'd like to also recognize this is a collaborative effort between Coast

Survey and CO-OPS. We currently operate a forecast model in Chesapeake Bay. It was the first model we implemented several years ago. Based on input by the pilots -- and I would like to acknowledge Captain Joe Smith, who has been very vocal about the performance -- and the performance above the Bay Bridge is not where we would like it.

I'm pleased to announce that this year we'll be implementing a new model in the Chesapeake Bay. It's a higher-density model, grid model. It is a 3-D model. Its performance will improve the forecasts up in the Upper Bay for the water levels. It also will be implementing currents, salinity and temperature and will be run four times a day. And the reason for that is because of the wind fields we get, are from the weather service and the weather service runs their models four times a day and so we take the grid from the weather service to drive our models. So that's the limitation on it.

Also, the forecasting will be only up until twelve hours into the future because that's, we fell

it's reliable operationally for making decisions. Also, Frank, on visibility, I would like to give little update -- since I don't know if you'll be here in afternoon -- is that we have a selected visibility sensor. The challenge that was given was something that would operate in a marine environment, reliable, and it's taken us several years of testing. We've been testing with the Coast Guard, FAA and Army Corps and we have successfully selected a sensor and doing implementation, integration this year. It will probably be available for implementation in the Chesapeake in, next year.

MR. DASSLER: Mike, did you say that's going to incorporate wind models into water level?

MR. SZABADOS: Yes. Yes. Yes, what we do is we take the wind fields from the National Weather Service, their regional models and global models and we take those appropriate winds and that's one of the driving forces for forecast, so we can get the impacts of changing winds which we'll incorporate. Again, they have a, they run it -- I'm not sure how far up into the

future but we'll input that into the model.

MR. SKINNER: David, did you have a comment?

MR. NEMERSON: Well, that really answered a lot of what, you know, that was pretty much exactly what I was asking for so that's great. And I guess my only question was, so there will be nothing more than a 12-hour into the future forecast available?

MR. SZABADOS: That's the plan right now, yes.

MR. NEMERSON: So the old forecast site that's up now will be taken down? Because that goes out, what does that go out, two or three days now?

MR. SZABADOS: I'll have to, to be honest with you, I'll have to take a look that but the forecast I recall is up into the next 12 hours into the future is the most reliable.

MR. NEMERSON: Uh-huh. Okay.

DR. JEFFRESS: Yeah, we also down on campus we run the Texas Coastal Ocean Observation Network, which is about 30-odd tide gauges including six from

the National Election-Service. We've been doing some work on predictions because since we have the same problem, actually a worse problem in Texas because of the wind-driven effects of water level, and we have been using what's called Artificial Neural Networks Technology, where you can train using a long-term dataset, which we have.

And we now have up on the Web forecasts of water level going out 24 hours; 12 hours, we're up above 90 percent actual water level observations with our predictions. As you go beyond 12 hours it starts to break down. And one of the biggest factors is predicted wind speed from the weather forecast is a huge factor in being able to predict out at least 12 hours.

CAPTAIN BARNUM: I would like to add on to what Gary said. Yes, the accuracy of the models really does depend on the forecast from the National Weather Service, so it's a big force and function in predicting beyond 12 hours in the accuracy of that forecast model. But I also wanted to add, Admiral West, you piqued my

interest about sea level rise and NOAA being the authority.

Certainly we're going to check into that. It certainly is something that our administrator, Dr. Lubchenco, has talked about adaptation to climate change and how do we take the global models and bring them down to the local level, to the scale that is useful to the local coastal managers and the ports and the pilots, et cetera.

So, certainly internally between the three offices, the Geodetic Survey, CO-OPS and Coast Survey, our moniker is Navigation Services but obviously these services are growing in importance and have usefulness, particularly with the National Spatial Reference System and the water levels datums that we maintain that are critical to understanding the sea level change. I've been corrected. It's not sea level rise, because in some areas it may be going down depending on where you are, so.

MR. SKINNER: Elaine?

MS. DICKINSON: Elaine Dickinson. This is

a question for Captain Kelly. We have had a lot of discussion in past meetings on the APOS-2 (phonetic) oil spill in the Delaware River which was the result of a humongous object undetected ripping open the hull of a ship. And I'm wondering as far as Chesapeake Bay or Baltimore, in this region, do you see many accidents or groundings that you would say are the result of unmarked objects on charts or outdated information or lack of chart updates?

CAPTAIN KELLY: The most recent that we have encountered actually was over on the Potomac River and involved one of our Coast Guard utility boats operating in the vicinity of where an old bridge wen across the Potomac River and everybody swore that all the old bridge pilings were gone. Well, we found one in low water. And, but other than that, fortunately, no, no, nothing major. Captain Nielson could probably provide any other historical data that goes beyond three years that I've been here. And by the way, if you're looking for that piece of metal, it's sitting over at the Coast Guard yard right now. It is a big

piece of metal.

MR. SKINNER: Eric?

CAPTAIN NIELSEN: No, thank goodness, we haven't found uncharted obstructions before we were made aware of them. The only area that is a question is like the slide I showed where new projects are underway where we know that construction or demolition has happened and then we ask the Bay Hydrographer to get in there and take a look. So I think the bay has been virtually or it's almost completely resurveyed. I think those hundred-year-old surveys are about finished and I don't expect we'll have any more surprises, hopefully.

MR. SKINNER: David, I had a question on the Baltimore Aquarium and its use of hydrographic data. Your presentation focused on the restoration efforts. Do you use hydrographic data for other types of projects like acoustic buoys or seafloor mapping, anything like that in your work?

MR. NEMERSON: Certainly not in my work and not that I'm aware of. I guess the other aspect, which

is, would be more on the operations side, would be just our physical plant located on the Inner Harbor of Baltimore. I mean, we struggled with Isabel, you know, like everyone else did on the Inner Harbor. We kind of, you know, sounded the all clear and then, you know, had the search come up and somewhat surprise us. So, certainly from the operations side, just storm search forecasting would be of value to the organization but not other products outside of the wetland restoration administration work that I do.

MR. SKINNER: I was at a climate change workshop that was sponsored by the New England Aquarium and all eight presenters showed a slide of the New England Aquarium four feet underwater, which caused the head of the Aquarium, Bud Riss (phonetic), who was there, to say that he was going to screen all PowerPoint presentations before he did this again. He said this is bad for business. Jon -- we're going to try and wrap up in the next five or ten minutes, so, Jon -- not, that's no reflection on you, Jon.

MR. DASSLER: Yeah, well, I would just

comment on what Steve mentioned before about once you get beyond 12 hours it's hard to get any kind of accuracy. So the Weather Service, the way they're doing that on the Columbia is they'll qualify that. So you could do a shorter term, what you would call a forecast, and then longer term, they would just classify that as a trend and qualify it, that that could change.

But since this is the last one and this is a subject near and dear to me, Mr. Golder, I know you mentioned RTK tides, and is that something that the Corps of Engineers that you're doing in that district now, you're implementing and you plan on implementing and how do you see that impacting your accuracies and efficiencies.

MR. GOLDER: Well, we plan on using it in the future. Right now, Philadelphia has a GPS grid up and it's basically located in our area. Plus we have Keystone that has a grid up in our area. So we're planning on subscribing probably to Keystone because I believe we'll be able to get more support. And it will

help us basically with having a manual tide reader. You know, we will set up the zoning down in Chesapeake Bay and then use the RTK on the boat to compute the tides up. And, basically it will cut out having the main tide reader and when one man is out, you know, have to keep the boat parked, basically.

MR. DASSLER: But you'll see that as an increase in accuracies because you'll get measurements right at the boat as opposed to at the gauge?

MR. GOLDER: Yes, sir. Yes, sir. We'll basically have three ways of doing it. We'll have a manual tide rate, an automatic tide gauge and the RTK and we'll compare them, yes, sir.

MR. SKINNER: I didn't mean to squash discussion. We still do have some time so if there are any questions, anything else?

MR. FITZGIBBON: I have one comment, two comments. First of all, from a business perspective, hydrographic data, business decisions are often based on your ability to import or export. It might have to do with your maritime facility. So, a case study would

be a business that Domino Sugar got into, which is the production of molasses, Grandma's molasses is something that you see in the food store, and that depended on our ability to bring alongside vessels with molasses at a point on our pier which is not our normal raw sugar discharge operations.

So that involved bringing a hydrographer and we had to do some dredging. And the timeline for that is, you know, we had to know the dollar amount of the dredging to be able to propose the project within two months. So that's the type of business decision that we've made. It allows us to continue to be competitive.

The second point I would like to make is on accuracy, the degree of accuracy that's needed is dependent on the user's decision-making. And, the story I'll give you is the Isabel story, where I was on the phone with supervision at the plant about the storm surge, which we were surprised at, and we were having discussion of when it gets to one foot down from the top of our dock you need to call me because at that

point in time we have to shut the plant down. As it happened one foot went to zero feet to three feet above the dock in the space of about an hour. But, we aren't interested in six inches, three inches; we're talking feet. So, their accuracy issue would depend on the user's needs.

MR. SKINNER: Thank you. Any other comments? Well, panelists, it was a series of really very informative presentations. We very much appreciate your being here and thank you for helping us with our recommendations.

(Applause)

MR. SKINNER: I think we're up for a break. So, if we could take a break and be back here at 11:15, that would be great. Thanks.

(There was a break in the proceedings.)

MR. SKINNER: First of all, while people are getting settled, I want to just make note of the fact that the panel members have been very busy since our last meeting and I think all of us appreciate people responding, letting people know when they see

something online or a news bulletin or get intelligence from some of the committees or Capitol Hill responding to some of the things that NOAA staff has been sending around and just generally being very active.

I know it takes a lot of time to go through a lot of the documents but I think having everyone's collective input on, in between the meetings is just as important as what we do at the meetings. So, again I appreciate people being very active in the off-season, so to speak, and, I think it makes the meetings a lot more productive so thank you. Steve, you're up next with the budget update and I think you have some good news.

CAPTAIN BARNUM: I hope it's good news. Normally Jack gives the budget update but unfortunately he was not able to be here today but I will give the update. I have a couple slides here before I get into the budget. Just some updates on Coast Survey, things that are happening in Coast Survey. Next slide, please. Certainly the big event tomorrow, with the acceptance of the Bay Hydro 2. It's a new vessel that

will replace the Bay Hydrographer, that is a research platform and certainly also a hydrographic platform of the Chesapeake Bay area, provides a new level of capability for both research and hydrographic survey for the Chesapeake Bay.

The Ferdinand Hassler, which is a Swath boat -- we have been briefed on that in the past -- ran into some difficulties or discussions with the shipyard. It is underway again and we have been told that it will be launched early next year. So, looking forward to seeing the Ferdinand Hassler delivered certainly to replace the capability that we lost with the decommissioning of the NOAA ship Rudy. So it will e a resource for the East Coast to certainly augment our contractor, our partners that also provide services to NOAA.

Had a very successful 2009 field procedures workshops in hydrographic field training. The attendees from National Marine Sanctuary, Nancy Foster, a nontraditional collector of data. They do coral reef surveys and habitat surveys of ocean exploration, NAVO,

Army Corps, UNH, shows some diversity of folks that are attending these workshops and training, seminars and how useful this information is, much more beyond navigation and the realization that collecting into a quality and a standard is important for the science-based decisions.

Interestingly, we had working in the international forefront we are, with my -- hat on, national hydrographic, we work with other nations in world to try and build capacity through the IHO and Katie Ries, my deputy, was instrumental in getting funding from the World Bank for equipment for release from Honduras and for the Gulf of Honduras initiative that's for them to be able to build a level of capacity to collect data to update their nautical charts.

The area is of a great interest from the habitat preservation point of view because it is the second largest barrier reef in the world and to protect that they need certainly accurate charts so the ships know where to go and not go and also to be able to portray this accurately on the chart. Next slide

please.

Exxon Valdez -- I don't know want to say anniversary or commemoration of the event -- was on the Hill about three weeks ago, and there was, I went there and Ed Welch was also there and some others, and, it was several congressional members came and spoke about the tragedy of the Exxon Valdez and thank God we have double hull tankers.

Certainly, one of the things that in NOAA we talk about, certainly with the advent of electronic navigational charts potentially that disaster could have been avoided had she had ENCs aboard, meaning that the skipper or the watch could be alerted to that danger when it was approaching, they could have provided corrective action as opposed to running into a live reef.

It was, interest was heightened because the Skatilla Mirfak Star ran aground or hit the INSO 74 in the lightering area off Galveston Bay I think a week are so before the Exxon Valdez and again people were praising the thoughtfulness or the foresight of double

hull tankers, which are a good thing; however, on that day of the event we had an urgent request from the U.S. Coast Guard to go and survey the lightering area because they had a single hull tanker come in next week.

And the story on that is that we received a request from the United States Coast Guard on late Thursday afternoon, started working on it Friday morning actively and by Friday afternoon that day we had had a million dollar contract awarded to one of our contract partners to go out and survey the lightering before the Mirfax Star arrived.

And so it is an example that money can be passed in a short order so we did it in a record eight hours. It took a lot of strength but I think it's an example of responsiveness to our constituents and also to the realization that double hull tankers are not always the answer, that good quality surveys and accurate nautical charts are still clearly important.

The next item we have is the formal acceptance of the Nautical Chart System 2. We talked

about this in the past. It's basically our chart system in the future. It's our one production system for producing paper charts, electronic navigational charts, Raster charts, and it's been five years in development. We're now entering our transition phase to production. It was a major milestone when we accepted the initial operating capability of the system.

John Lowell is here with us today, chief of the marine chart division and we see this as our future of chart production. It's going to impact us in many ways because as we transition from our existing production systems we'll have two production systems in parallel.

So, as we transfer the loading from one system, the legacy system to the new system it's going to cause us to basically slow down the number of new editions that we put out; however, we still are committed to it putting the critical information out to the mariner. So, that transition will occur over several years, two to three years before we get up to

full speed over a five-year period. Next slide.

The mapping and budget, this was the first year we received a President's request. The last few years we have had continuing resolutions where they took the previous budgeted and added an X number of percent and our initiatives never really made it into our budget. So, in the mapping and charting base in '08 it was 44 million; 2009, 47 million. ENCs, we finally got the roughly 2 million dollar increase we had been asking for, for the past several years.

That's critically important because I think as we briefed earlier at previous meetings that the IMO is moving toward to make ENCs mandatory for base implementation starts at 2012, so not only will high speed craft have to have active systems or the ENCs, you know, phased in for all -- vessels. So we are working feverishly to produce those ENCs and transition to our new system at the same time so it's a big challenge for us.

The shoreline mapping, $2.3 million, 2.4 in '09, Joint Hydrographic Center roughly unchanged,

slight increase. Survey backlog from 26 to $30 million restored to previous levels, there was a, some earmarks, EEZ surveys in Alaska for $500,000, ordinate surveys in Hawaii for 500,000, California seafloor mapping, $1.5 million and Hudson River mapping, $445,000.

These were earmarks that were added to us for a total of 93 million up from 84 million. We did also receive roughly $40 million in the 2009 Stimulus. Next slide. And, before I get to that again I just note that what was in the '09 President's budget, there was a million dollars in there for ping-to-chart data streamlining.

A lot of that is looking at the pipeline of data that goes from our own vessels and contract providers through the processing centers all the way to the production of the nautical products; $2 million in there for continuing the V-DATUM effort on a national scale; $2 million again for electronic navigational charts; $1.8 million for navigation response teams and $700,000 for AUV research and development and again, as

I mentioned, earmarks for Hudson River, California and others. Next slide.

Under the American -- Recovery and Reinvention -- I couldn't remember the reinvention part -- we received $40 million. The NOAA plan has been transmitted to the Hill. There was a press announcement a couple, few days ago for final approvals. Basically $40 million to reduce the critical hydrographic survey backlog by 1730 contractor-acquired square miles. Roughly 75 percent of that will be for contractor surveys, basically expanding the polygons that we already have on the books so taking advantage of the projects we already had planned. We're shovel-ready. We're just ready and been waiting so it's just a process of all the details being ironed out between OMB, the Department and Congress.

The funding will also be used to support a significant increase in data for these contracts to include so that we don't acquire much of the data that sits at the door. We're looking at improving the water

level support, automated water level processing such as occurred from what NGS does with OPUS, shoreline support for survey areas, NGS, V-DATUM, increasing the pace of the V-DATUM from around the nation, hydrographic support for chart updates. These are all contracts. These are not hiring internal folks. These are all for existing contracts that we have for support and to archive and distribute the data, make sure that the data is readily available to the end users.

And, I don't know, Juliana or Mike, you wanted to add anything to those? No, okay. Next slide. Here we have the Geodesy budget. We have again showing between 2008 and 2009 roughly a million dollar increase. A height-mod was at $5 million and in 2009 it took a drop to two and a half but you can see some other earmarks have been added in so it roughly comes out in a wash for twenty-eight, eight million dollars. Next slide.

For National Geodetic Survey, they look to expand their role in real-time positioning, advancing IOCM through some pilot projects, some of which we saw

today such as the, heard about the Sentinel sites around the country for understanding sea level rise, adaptation to coastal management and restoration projects, new positioning products, OPUS, moving forward with height modernization and gravity, a redefinition for the American vertical data draftee. And outreach and education on the socioeconomic benefits of NGS products and services. Next slide.

Tides and currents, they got an increase from 26 million to 31 million, so, total counting earmarks, 27 and a half to 31-3. The '08 language on PORTS indicates that they provided a million point-four above the budget request allowed. NOAA begins supporting the entire maintenance and operations of the PORTS, not just a system design; 2009, an active ATBs, adjustments to base, $2 million ports expansion and forecast model funds, a two and a half million dollar earmark and tides and currents basework ports operations and maintenance.

And then the '09 appropriation included two and a half million dollars for better support, existing

operation and maintenance support; it's not full federal funding but to better support the operations of the systems they have. Next slide. And that is it. I'm take questions, and Mike and Juliana.

MR. DASSLER: Do we have copies of this; did we get a printout?

MS. CHAPPELL: No. We were hoping that the national -- I'll make copies of this for you. We were hoping that the Spend Plan would be finalized so we could change the slides to say that but it wasn't but I can e-mail out to you provide copies as well.

MR. DASSLER: The one thing that would be helpful -- and we used to get this in the past -- is how that's like the Stimulus and where are those square nautical miles and how that's distributed on the projects, just kind of sort of that breakout of things I know that was, concerns that have been raised by the private sector.

CAPTAIN BARNUM: Sure, we can provide that. Like I say, evolved last minute embargoed information because we don't, but we can provide that information.

As I said most of these projects we'll be adding to existing projects we have, basically expanding the polygons of projects we already had on the books for '09.

MR. SKINNER: Admiral West and then Gary.

ADMIRAL WEST: Steve, is there a law against single versus double hulled tankers in U.S. ports; is there a law for that, anybody know?

CAPTAIN BARNUM: I don't think there's a law. I think single hull tankers are grandfathered till 2015 if memory serves me correct.

MR. WELCH: Yeah, the Oil Pollution Act basically says that to serve the United States you have to be a double hull tanker but there was a phase-out schedule for existing single hull tankers, and, in effect 2015 is the date by which all double hull tankers will be phased out.

It's sort of strange how these schedules work out. The phase-out schedule had a lot to do with the economic lifespans of the existing U.S. flag tanker fleet; in other words, single hull U.S. flag tankers

aren't being phased out by the law any faster than their economic plight was projected to be back in 1980 as opposed to foreign flag tankers where a lot of them had been displaced out of the U.S. market well before they expected to be.

DR. JEFFRESS: Steve, with this Stimulus money I have been hearing that there's a lot of boarding associated with it to make sure there are jobs generated or jobs saved. Are we looking at jobs generated for this hydrographic industry and if so where are we going to get those folks?

CAPTAIN BARNUM: I think we've certainly talked to projects within Coast Survey and certainly in the hydrographic services I know that many of the contract providers, these are jobs preserved because the oil industry is down right now and so business is down so this helps maintain those companies to maintain their employees and their operations. Similarly, with, we look potentially at jobs created through contract providers for nautical chart updates in our Cardow contract for processing of the hydrographic surveys.

So, Juliana, I don't know, Mike, if you want to talk to your programs.

MS. BLACKWELL: As far as the NGS remote sensing Stimulus money that was up on the screen, that is all being let through contracts as well to provide the work for contractors that are currently onboard but not necessarily staffed at this time to do the work that needs to be done, so, all that money will be --

MR. SZABADOS: Our funding of expenditures Stimulus are focusing on contracts, software contracts, a good portion to develop an interface on the Web where people can come process their -- like OPUS does for GPS and to use -- so the data can be more easily ingested and everybody using the same algorithms.

MR. DASSLER: Just to follow-up on Gary's question, because I've heard the same thing that there's a pretty detailed reporting requirement out of the Stimulus funds so I mean is that, that's something, I mean, even as contractors we can provide. I mean, it would be not only just job preservation but creation of jobs and I don't, I haven't seen anything on that yet

but I'm assuming that is going to be a requirement for doing that.

And then just, I guess you mentioned the field procedures workshop. I know this year they didn't have contractors get involved and maybe that was because of all the other involvement, that was just kind of space limited but I don't know if that's going to in the future. I mean, it is pretty beneficial to make sure everybody is kind of on the same page and do that and if it's possible that would be nice to see that happening again.

MR. WELCH: Steve, is it fair to say that 80 percent or higher of the total $40 million is going to NOAA and then going very quickly out the door to private contractors in one form or another?

CAPTAIN BARNUM: Yes. I would say as soon as we receive the funding we expect that within 60 days it will be out the door. So we have been shovel-ready, just waiting on the money.

MR. WELCH: Is there a way to quantify the impact that that $40 million will have on the mapping

and charting backlog? Can it be said that this will reduce the backlog by X percentage or X amount?

MR. ARMSTRONG: I think Steve's slides showed a number of square nautical miles associated with this $40 million, 1700 and something.

MR. WELCH: Right. If I'm a policymaker and I hear us, for NOAA or whoever complain about this huge backlog, I would like to know, okay, what percentage of that backlog are you knocking off as a result of this; can that be articulated now or in the future?

CAPTAIN BARNUM: Well, we can do the math. It will be a significant percentage. I was asked that question last week by Senator Landrieu and, you know, our current map at our current production rates at roughly 3,000 nautical miles a year for the 500,000 we want to accomplish is 166 years. So that opened her eyes. Certainly where our goal wants to be is we would like to be at 10,000 square nautical miles on a 50-year cycle, at least. But and the bottom line, your answer, it will have an effect to speed up our acquisition of

backlog data but it's not a great impact.

MR. WELCH: And Steve, have you now or is there another opportunity later in the two days for somebody to discuss the impact of Stimulus on other NOAA programs that this panel has shown some interest in, in the past, for example, vessels equipment or that type of thing?

CAPTAIN BARNUM: We can get that information for you. It would be relatively high level. I know that certainly for the ships there was some funding received for -- I didn't have it in my presentation here -- it's under the Office of Marine Aircraft Operations but funding for the major repair period for the north-ship Rainier, that we toured a couple years ago, also to upgrade our multi-capability but I can get you a breakdown for the rest of them.

MR. WELCH: Well, I just remember, for example, there was quite a bit of interest by panel members in those new hydrographic launches, out there on the Rainier and I think this Stimulus will produce some more of those launches.

CAPTAIN BARNUM: That's correct. That was also part of the package for marine aircraft operations to fill out the launches.

MR. SKINNER: Elaine?

MS. DICKINSON: Tom, you sent us a press release on April 7 that listed every single program and how much money they were getting out of the Recovery Act. I don't know if that answers Ed's question about how many programs are getting money.

MR. SKINNER: You want me to send that around again or --

MS. DICKINSON: Well, I brought a copy of it just because it was interesting. I have sort of a slightly different question. When, I mean, it's great that you're getting this money to address the backlog. When all this data comes piling in from all the contractors, do you have the staff to process it all or is it going to create another backlog when it gets to headquarters and this stuff actually has to get on the charts?

CAPTAIN BARNUM: That's one reason that not

all the money went out to the hydrocontracts. We reserved a percentage of that for the processing and the marine centers to buy contracting capability to augment our capacity, the same in the production of the nautical charts, the compilation of data on nautical products. So again that's, we'll all be in contract so when the money is expended we're not, you know, we obviously have the flexibility to get downsized, if you will.

MR. DASSLER: I got one.

MR. SKINNER: Actually, Ed and --

MR. WELCH: Well, I would like to commend Steve and Jack and all their folks because the fact this money showed up in the Stimulus Bill and went to these programs, it didn't just happen. There was a lot of internal advocacy, I guess, within the agency is the polite way of putting it. There were plenty of other people, plenty of other programs that had their hand out for the money and people had to put, people had to first put together substantive proposals and second, they had to be, they had to have some sharp elbows to

advance their substantive proposals.

So, I would like to commend all those that were involved and go out and going out for the money. And I also, also like to say that I think the odds are against it but I think there's a 25 or a 30 percent chance that in the next 12 months there will be a Stimulus 2 bill, so, I would encourage the same folks that were aggressive this time to think in terms of what could you propose for a Stimulus 2 bill. I mean, these opportunities don't come around very much and you need to be ready if they do.

DR. JEFFRESS: Steve, in the past Congress has been reluctant to increase the size of the federal government so does this Stimulus Package allow you to employ more people at NOS?

CAPTAIN BARNUM: These, this in the Stimulus Package, we did not increase the size of the federal workforce within our purview at all. This is all for augmenting our capacity to contract again to get the money into the economy quickly and to again give us a helping hand with some of the things that

we're trying to do, both from acquisition to data through water levels, Geodesy and survey. So, we're not building the federal government through this money.

MR. SKINNER: Jon?

MR. DASSLER: So I know originally when a lot of this was going around they were talking 80 million that was going to go towards Stimulus on addressing the survey backlog so out of this 40 million, is this anticipated to be all spent in '09 or is this going to roll into ten or is there --

CAPTAIN BARNUM: It's two-year money. So.

MR. DASSLER: So that 1730, that's going to be not all of us here?

CAPTAIN BARNUM: We have two years to get it out. Our intent is to again get it out as soon as possible. Our intent is to get it out in 60 days.

ADMIRAL WEST: As a follow-on to what Ed said about the efficacy, I don't think they would be ever be able to -- we may ask NOAA to say, what role did this panel have in helping that Stimulus money get identified strictly for our, did the Ten Most Wanted

help, did our briefing to SAB, going to the Hill, having these panels, was that a factor in this or not?

CAPTAIN BARNUM: Well, I'll jump in here. And certainly I think the HSRP report has been a key document in identifying the requirements and laying it out clearly to certainly internally at NOAA through the budget process both in NOAA, the Department and OPM in addition to the appropriators and the key decision-makers on the Hill to understand what the issues are. So I think it's a key document in communicating that.

MR. DASSLER: There was a fair amount of lobbying by the private sector in using actually some of the reports and recommendations from the HSRP that went out to local representatives.

ADMIRAL WEST: We have a body of folks coming tomorrow. Maybe that's a good question for them because if we're Congressionally mandated, Federal Advisory Committee, if we're not influencing the system then why do we sit? So, you know, at some point if we do, are effective in doing good things then it needs to

be acknowledged not just amongst us here listening to ourselves but in the system. I guess that's my point.

MR. WELCH: Admiral, I think if we could pat ourselves on the back a little bit, I think just by the panel being pretty aggressive and persistent with our folks at NOAA and with the upper reaches of NOAA, where our contacts with Jack Dunnigan or Mary Glackin and just sort of beating on them saying you got to get on with it, helped inspire them to make sure that they were ready when this opportunity came along. So, that's a somewhat indirect way.

We weren't necessarily lobbying as a panel on the Hill but the way I see the Stimulus Bills, the Hill doesn't write the details. They provide money and they rely on assurances from the agency policy people that the projects that are being included in the proposed spend plans are, meet the broad parameters of what they wanted to accomplish in this. So, in some ways the battle wasn't necessarily with the Hill, the battle was within the Department and NOAA.

ADMIRAL WEST: Well, I agree. And I mean I

didn't make this to be a pat ourselves on the back because we are all pretty happy with what we do but it's a good example of how a federal advisory committee can help. And I think it's, I have been on several of them, as you know, and I think this has probably been the most effective advisory committee that I have been on just from what I seen and this may be another good example of how a federal advisory committee operates and can help embrace a level of that particular mission within NOAA to the leadership of NOAA and even to some extent to Congress and to OMB.

Because, it's so hard in NOAA with so many little bitty, you know, missions all over the place -- and they've got several advisory committees -- that this has been a good, well, I mean, you know, there's just sometime internally NOAA should recognize that this congressionally mandated federal advisory committee has helped this part of the mission of NOAA, not necessarily us but the way the system works.

MR. SKINNER: Just one observation on that is that, if you recall way back the early years of this

panel, we spent a lot of time working on getting the message right. And I think Scott really deserves a lot of credit for making sure that the report came out and actually said something and actually was useful.

We could have gone a lot of different directions and I think at many points in our history we were set to come up with something that would have looked very different and I think it's because of his persistence and a lot of work of the NOAA staff in helping to put it together address contracting issues and all those horrendous things that, God, it seems like a lot longer than a couple years ago but it really could have done been a very different outcome and I think would have had a different impact on what we see today. So I just wanted to recognize in particular Scott for spending so much time to make sure that we did the right thing, however painful it was for the first couple two or three years.

DR. JEFFRESS: Tom, just on that point, the document has the number 2007 on it now. I'm wondering if we should not think about an update to this Most

Wanted List. And I know a lot of it is not going to change because nothing's happened but just having the number updated to like 2009 or 2010, it looks fresher amongst politicians' eyes.

MR. SKINNER: I think we may talk a little bit more about that for the strategic plan. I think that's probably a good idea. And, we may want to do more than just, just some of the numbers. We've heard a lot of, really, I think, very compelling arguments in some of the testimony or some of the panel presentations, and it would be I think advantageous to include those in an updated report. I think that's a good idea. Admiral?

ADMIRAL WEST: Just as a quick follow-on to the panel, having sat on three or four other panels of NOAA, the success we have had with this one I think is also because of involvement of NOAA. Steve, Jack, everybody's that's been part of this has been acceptable to what we said. I've been on some where they look at the federal advisory committee as the enemy. So, I guess a good lesson is learned from NOAA

as to how this would work regardless of the mission. Somehow we've got to document this and get this stuff to Jane or to the new Commerce or whatever.

MR. DASSLER: Yeah, it seems to me our next task is how do we maintain those levels. I think the '09 Stimulus really provides wheels-up funding to help get nautical charting up to the levels that it needs to be. I guess what we don't want is that to just be a blip in the curve, if we can just keep moving that forward and I think that's something the panel, whether it's updating the Most Wanted List or what we can do to help move that forward to where it's now that we have gotten some visibility and there's some stimulus put towards that, how can we keep that in flight?

CAPTAIN BARNUM: I think certainly with the message of the current administration, President Obama that his emphasis is on infrastructure and transportation, I think the services we provide are key to enabling some of those projects. And, so, I think that, I think the opportunities are good that we may provide more recognition of these services both in

terms of navigation in both what we heard from the panel today for the importance of this data for restoration projects and how we may adapt to climate change, those issues. Just one other point that I didn't mention in my presentation is that my understanding is, is that the President's budget will be released sometime in early May for the FY10.

MR. SKINNER: Well, we'll have some chance I believe tomorrow to talk about the strategic plan and where the panel goes from here. I think that's a really good discussion to have and some great thoughts here. Are there any final questions on the budget for Steve?

Why don't we move into our public comment session. I want to remind any of the public attendees here to please sign in and if anyone is interested in making some comments, this is the start of one of several public comment periods over the next, over today and over tomorrow so feel free to speak now or speak at one of the future sessions. Is there anyone who signed in that's indicated that they want to speak?

Would anyone like to make some remarks? Okay. We'll have to, we need to keep the comment period open for -- okay. Hearing none we will break for lunch and resume at one o'clock.

(There was a luncheon break in the proceedings.)

MR. SKINNER: Thanks very much. This afternoon we're starting off with some updates. Mike, I think you're up first.

MR. SZABADOS: Before I bring the presentation up, I'm going to give an overview of our 2009 activities. I have organized my presentation in response to the Five Most Wanted so I had put it in those categories. I first have to report on a homework assignment I had.

At the Tampa Bay meeting we talked about the integration of PORTS and Coast Guard AIS system and the question was what is the plan for rolling out operations and I had to get back to you on that. And discussions with the Coast Guard, we'll give you an update. The test at Tampa has been successful. There

be demonstrated the PORTS has been integrated into the AIS system. It's one of the environmental binary formats that they have implemented. There's additional work. There's other binary formats they're working on and they'll be doing some work this year in the Columbia River.

In regards to the PORTS system we're ready to implement, all our PORTS data is available for the AIS system waiting for the contract to take them. Coast Guard is planning to start rolling it out operationally in 2010 and I will have more specifics when in 2010 over the next several months, so by the next meeting I will have some more specifics. But they're going to do some more integration of additional binary formats for additional information this year, and then roll out all the new enhancements in 2010. Go onto the first slide, please.

Okay. In addressing the recommendation, number one, aggressively map the nation's shorelines and navigationally significant waters, next, okay, we're expanding our world up to additional five

stations this year to 210 stations. And what's the significance of this in supporting mapping well, in mapping the shoreline and mapping the waters, relies on having critical datum reference stations and the 210 go to our network requirement of about 300 to get the proper coverage for our reference stations in the United States.

So we're expanding three in the Gulf of Mexico and in Alaska, two critical areas -- for our reference network. These are long-term stations and this is a permanent station. It takes 19 years to get a reference point so it's critical that these stations are sustained. Next slide, please.

The next recommendation, integrate coastal mapping efforts and ensure federally maintained channels, approaches and anchorages are surveyed to the highest standards. Next one, okay, in this effort and I want to highlight this is a collaborative effort of all the three offices, not just CO-OPS but all three offices and we're working with the Army Corps. The Army Corps has, as I mentioned earlier, has identified

and implemented NOS standards for control and so all the offices are working, to work in the Coast Guard in training, SOPs, standards, implementation plans. Further work is being done since the Army Corps recognizes NTSLF as the authority for sea level in the United States that we're working on interim guidance, incorporating sea level change for all U.S. Army Corps projects, and also helping them look at the vulnerability of their core projects to sea level rise. Next slide, please.

There's another activity. Again, I want to, this is it all three offices are working on, with the CMTS, agencies to look at what's the necessary infrastructure to support safety, safe navigation in the Arctic. I know that's been a hot topic in the past. We had a discussion in Tampa and it continues to be an important discussion. And we're working with the Coast Guard, Army Corps and through the CMTS on that. Hopefully we will have something which in the foreseeable future report out on those activities. Next slide, please.

Modernize heights and implement real-time water levels and currents, observing systems in all major commercial ports, recommendation number three. Next slide. We continue to update our tidal current predictions. This is critical, you know, for safety navigation to be able to predict the tidal currents and we have a lot of data-board areas as well as old information and we're focusing in '09 in updates in Florida as shown on the slide as well as Buzzard Bay up in Massachusetts and in Kodiak in Alaska. And this year we'll do recon and planning for Long Island Sound, in 2010, Dutch Harbor, Tacoma Narrows and Johns Pass in Florida. Next slide, please.

PORTS program, the PORTS program expanded quite a few new ports. We have two new ports coming online over the next several months. Actually, Adam McBride in Lake Charles, I'll be with Adam the first week in May as we christen his ports. They'll become online. New Orleans will be coming online later, anticipating June timeframe for New Orleans. We have a new port underway being planned by New London,

Connecticut. That's with the U.S. Navy and their driving forces, they want ports for the boomers coming and going. Next slide.

Okay. This is, I know this is it important one. In our 2009 budget this year, there's $2.5 million identified above the President's request. I do want to clarify something. It was not identified as an earmark. It's above the President's request but not an earmark. So, what that is, I don't know. But it's 2.5 million dollars, going to PORTS O&M, and we're going to either fully fund or partially fund up to 15 of the PORTS systems and -- investing almost close to a million dollars in infrastructure. One things say for the contractors but a lot of the spare parts, recapitalizations over the past few years has been hurting so we invest some into spare parts and some into contracts. For those here locally Chesapeake Bay is once going to be funded. I know New York is going to be funded, Houston, Dallas is going to be funded. In fact all the Gulf ports are right now covered by O&M. Next slide, please.

Integrating new technologies in 2009, this is something I think I mentioned a little more update on that, we're looking at microwave water level sensors as a new technology. We're looking at four systems. One of the things in this study is that just we're going into, we're using wave tanks for assessment of how they perform in wave conditions, actually environmental-controlled laboratory conditions. We've been working with EPA actually in environmental control conditions, so, and one of the things we found out is that some of these sensors are susceptible to temperature change, which we did not know.

So some of these tests we're finding some good things out of that, as well as we're running these in parallel with our sensors, one in the open ocean, one in the estuary for one of the Great Lakes. We're doing a long-term study on that, and very promising, there's going to be, we will probably start the sensors from the study as potential enhancement, additional sensor. This probably will not go in every application. Obviously we're placing the device, a

microwave sensor may not be best sensor for that but there's probably a lot of adaptations. What's good about it, it gets us out of the water so survivability over the network will hopefully improve.

The visibility, as I mentioned earlier this morning, for the panel, we have done some final testing. This is a test, actually, when I was the -- goes back to the late nineties when we started testing, unsuccessfully, visibility sensors now. The technology is not new but one that is reliable in the marine environment is, and after testing again we did this with actually with the EPA, Coast Guard, Army Corps, and FAA.

We are selecting the sensor and actually all the federal agencies are selecting the same sensor. I won't go into all of the details except that we're doing integration of the sensor into the PORTS system, quality control, infrastructure. Our goal is to have it integrated by the fall and once that is demonstrated then we will implement it throughout the PORTS system where there's requirements and there's resources.

Air-gap, we implemented air-gap a few years ago. What we have done is put an additional sensor and in the process actually some of the funds from the 2.5 million is going to enhance the air-gap network we have. It's a laser-based system. It's going to be right next to our microwave system, and this will, this is going to be used for quality control. It's a redundant sensor, different technology but it's going to give us accuracy, part of our quality control. So before we used the water level network to see the comparisons, but a direct measurement is much better and so we went with this redundant technology, that's being implemented. Waves is a -- we're working with the Army Corps.

The Army Corps has a network of wave gauges and we want to integrate that into PORTS. Well, to do that we have to a have an MLU and the Army Corps as well as we have to build the infrasructure for taking quality control in. That is going on now, and I anticipate that integration to be available in 2010. But that's very encouraging. I know we have some

movies out in, Chesapeake right now, pilot access, not through PORTS, other means, same thing allied, so we're looking forward to get that integration, get that one-stop shopping for information. Next slide, please.

Okay. Recommendation number four, strengthen NOAA's navigation services for emergency response and recovery capabilities. Next slide. What's important for us is in the emergency response is to make sure the information is there after a major event like a hurricane, storm surge and our lessons learned from Katrina and other hurricanes is that we need to strengthen our water level by elevating -- platforms and this year we'll go ahead with -- one, two, three, four, five, six, seven, eight -- nine, is that nine? I think nine of our stations have been identified for being upgraded to these elevated platforms.

This is Mobile, the one we did in 2007. We're also upgrading by providing 30 additional meteorological packages out of the world network. Again it's an ocean atmospheric couples system. To

understand the tides we need to do know what the winds are doing, and that information is also critical for the mariner and actually for the marine forecast. So that's going on in 2009. Next slide, please.

Okay. Dissemination of hydrographic services data and products to achieve greatest public good, recommendation number five. All right. You heard a little bit about it today how we're trying to work with the coastal management to benefit from using this information. Actually this was developed here. In Chesapeake Bay there's two frequency in duration product. It's a tool that based on our tool and our historical data, tide data we know how frequent statistically at a location be inundated and flooded and how long.

It's critical when planning what kind of grass you're going to plant and trying to determine elevations. We're building this. Right now it's a tool that we have to operate. We're going to build it on the Web so people can come into our site, download our data and actually use this tool interactively on

the Web. So that's an enhancement and we have some training in that. The next slide.

Sea level, I can give a half hour on this alone. I'll just cut to the chase. NOS is the legal authority for sea level in the United States. I can only do the nautical charts and shoreline, those based on tidal datum which is at sea level. And we have been monitoring sea level since the beginning. And, to make sure that our charts are relevant we constantly update, we periodically update officially for the United States what sea level is.

When I say sea level I'm going to say relative sea level which is local mean sea level. It's not global sea level but it's local mean sea level but that's where charts are, boundaries, and so we're responsible for that. So as part of our education and outreach we developed a Website and we now provide I think at 120 stations -- we happen to have a long record for this, the sea level trends at those stations as well as been working with the IOC and we now also incorporate international stations.

So, this site is being recognized is an IOC GLOS station site to determine sea level. But it's information of trends. There's seasonal variability. There's five-year trends. Again, I can go for a lengthy discussion on this. I'm not going to right now. I would love to talk to anybody afterwards or during the break about these enhancements. Next slide, please.

Oh, that's when I shouted out I knew what sea level in Baltimore was, I had this slide in front of me so I was ready. Okay. On the modelling effort again, this is a collaborative effort. Technology, great work is being done in the development survey, to help develop these models by implementing an enhanced Chesapeake Bay model as I indicated and two new ones, one in Delaware and Tampa Bay.

These are three high resolution models, outputs, tides, currents, temperatures -- and basically through higher resolution we anticipate a better and more accurate model for areas like in the bay here in the Chesapeake. And that's going to be rolled out this

year and again we will be working with local users when that's available in trying to understand how best use that product and also how many we can create, take that information and make it usable for the user. Next slide, please.

Okay. Outreach, one of the things I know that this panel and Admiral West, you vocally commented on is that we need to reach out to users to better understand that the general public benefits from navigational services. And, we've been trying to determine how best to do that and so we packaged a, and this is a DVD, which we're in the process of marketing, again highlighting the benefits of the water level program and this highlights a special program we had, our Sentinels program, hardened-stations which we designed in the Gulf.

We have four of them and part of it gets marketing. It's a DVD. Our goal is to get this outreach around some marketing material and out by hurricane season, and to the schools, general public for better understanding and appreciation for

navigational services in multiple applications. I'm going to play it for you in a minute but this is another version which is being voiced over by a high school student for the high school, and a little bit different twist on it go to the younger generation. So if you could go ahead and play that.

(DVD played)

NARRATOR: What is it about the ocean that attracts so many of us? We like to play in it, get our food from it, build our houses near it and gaze out at it. Our economy depends on the goods that come in and go out to our major PORTS. The ocean makes us feel good, contributes towards economic growth and we like to be close to it. It's not surprising that almost half of our population lives near the coastline.

But working and playing along the coast is not always serene. Powerful coastal storms can raise the water levels significantly, 20 feet or even more, causing loss of life, destroying homes, businesses and property. Hurricanes like Katrina and Ike showed us firsthand the risks that coastal communities face.

MALE VOICE: It was 32 feet. We went to the first floor, to the second floor, to the attic. The water came up to us like here and it was rough, and we wound up swimming to the tree and luckily it subsided.

NARRATOR: With ocean waters warming and sea levels rising it is likely that the U.S. will encounter future storms equally as harmful and costly and with so many of people living along the coast the stakes are getting higher each year.

Storm destruction is rarely limited to lost lives and property. Instruments collecting water level and meteorological information must be located in harm's way so they can deliver data critical for flooding forecasts and emergency evacuations but all too often these stations are damaged or destroyed during the very times we need them. The National Oceanographic and Atmospheric Administration or NOAA has responded to this dilemma by strengthening some of its storm tide stations.

Known as NOAA's Sentinel of the Coast,

these platforms are single-pile, four feet in diameter structures that stand at least 20 feet above the sea surface and are driven 60 to 100 feet into the sea floor for stability. For over 200 years NOAA has monitored the rise and fall of tides using the latest technology. Beginning with human observers in the early 19th century, NOAA has harnessed technology to operate its network of tide stations that automatically collect accurate and reliable data every six minutes. Today NOAA maintains more than 200 permanent water level observing stations.

NOAA's goal is to ensure that the public has advanced notice based on the most accurate and up-to-date storm tide and meteorological information. This is only possible, however, when the tide stations operate throughout the storm, so Sentinels are designed to withstand a category four hurricane with winds up to 155 miles per hour and storm surges of nearly 20 feet above normal.

Planning, design, construction and operation requires a team of experts in surveying,

engineering, pile installation, oceanography, quality control and Web expertise. With new technology NOAA is better meeting the needs of coastal communities. Lives are often at stake during the 24 hours before a major storm. Once flood waters begin to rise, it becomes critical to know which evacuation routes are passable.

MALE VOICE: Having this kind of media real-time data up close that our community has access to is critical for us in our day-to-day operation.

NARRATOR: Each Sentinel will report real-time water level and meteorological observation. Water level measurements are precisely referenced to ensure that coastal communities can make informed decisions to elevate housing, build levies and plan evacuation routes. In addition to storm time reporting the products that result from NOAA's instruments also contribute to safe navigation, accurate charting, marine engineering, sea level change monitoring and other important activities.

MALE VOICE: When we take crews out we always check the tides. Being from South Louisiana,

you have to make sure your barges and boats can get in before you can begin any work. Tide information is very important.

NARRATOR: The first Sentinels were constructed along the Gulf Coast at Kalkashew (phonetic) Pass, Amarod (phonetic) Pass and Shell Beach, Louisiana and Bay Wetland in Mississippi. Hurricanes Gustav and Ike tested the Sentinels within weeks of installation. Standing strong they delivered tomorrow tide data which were used by emergency responders as well as thousands of coastal residents. More Sentinels are planned and will be built at exposed coastal locations as funding becomes available. Other stations in less exposed areas will be elevated above storm surge range on substantial structures.

Coastal communities must be ever-vigilant. Even tropical storms can deal a massive blow to many residents, especially storms that make landfall on a high tide. Sentinels are designed to serve the over 150 million residents of coastal communities, planning for the worst and hoping that we never need those

plans; however, if the unthinkable happens NOAA's Sentinels will be there standing tall and providing a safe haven for instruments that are vital to planning for and responding to nature's fury.

(DVD concluded)

MR. SZABADOS: Again our goal is to get this package and some outreach material and target for the upcoming hurricane season. All right. Any questions?

MR. WELCH: Mike, how much does one of those Sentinels cost?

MR. SZABADOS: Good question. We built those right after the Katrina and the negotiation for prices, we were at the point where if you didn't negotiate you hope you got the contract. The cost for those right now, they're half a million dollars apiece. The elevated platform is a lot less, depending on the location but it's, I'm going to say less than a hundred thousand dollars for that, that frame.

DR. JEFFRESS: Mike, I'm sure you're aware that the Corps of Engineers has plans to put two

Sentinels in Texas. We're working with you guys and I think you're in the loop.

MR. SZABADOS: That's correct. Based, what Gary's talking about, in Galveston there was a platform designed by the Corps which did not survive --

DR. JEFFRESS: Ike.

MR. SZABADOS: -- Ike --

DR. JEFFRESS: Yeah.

MR. SZABADOS: -- and they're very interested in our design working with them and actually part of the Houston PORTS system.

DR. JEFFRESS: Right.

MR. DASSLER: Mike, I was just curious how they're dealing with benchmark requirements and leveling out on those sites and have they thought about just putting in a Corps station for monitoring movement of the platform?

MR. SZABADOS: Okay. I'm not a -- expert, okay, so I'm not the right person probably to answer that. I can get that. I do know something we used bathymetric levels to get the location as well as one

of the locations in Bay Waverly, there's going to be a Corps site installed on one of them.

DR. JEFFRESS: And the Corps plans on putting Corps stations on both the Sentinels in Texas.

ADMIRAL WEST: Mike, PORTS, when you submitted your budget was there money in there for O&M?

MR. SZABADOS: Um, I have to be careful here because there's a couple things. We operate in three-year budgets, okay? We got the current year, 2010, 2011 --

ADMIRAL WEST: Let's just talk about the year you had in your slide where the congressional add was 2.5.

MR. SZABADOS: Okay.

ADMIRAL WEST: Now, the congressional ad was specifically for O&M, correct?

MR. SZABADOS: That's correct.

ADMIRAL WEST: So they added to a line that already had O&M, correct?

MR. SZABADOS: They added to -- they added 2.5 with language identifying that 2.5, specifically

the words were to continue PORTS O&M operations.

ADMIRAL WEST: Okay. So, but you had not identified any specific O&M money in your budget to submit, right?

MR. SZABADOS: That is correct. There was an increase for funding for PORTS in 2009 for the federal infrastructure. Since the PORTS has grown and we need more infrastructure to support that operation, internal operation, quality control, data management. There was money identified in the budget which was successful but we did not identify PORTS O&M as part of the President's request.

ADMIRAL WEST: How do you divvy up the O&M add?

MR. SZABADOS: The way we divvied up the O&M is over the, first of all, we got with the earmark last year we got guidance from the appropriators how to divvy up that money. We basically used that guidance with the following criteria: First of all, we operate, maintain PORTS. We have two models of PORTS operations, one, where the partner funds NOAA to

operate those PORTS and the other model is where the local partner has decided they're going to operate to NOAA standards.

The only mechanism we have right now for funding the PORTS system is where we are actually operating it through the, our contracts so those PORTS that were identified which had the O&M that we could manage. The decision was based on the guidance the Gulf PORTS in Gulf of Mexico were a high priority for the appropriators.

So the Gulf PORTS were funded, all the PORTS, from Mobile through Texas. Chesapeake Bay, upper Chesapeake Bay, the lower Chesapeake Bay is funded by the Navy and New York was funded. The other, some of the other PORTS where we gave some partial funding we do collaborate and do provide some tide support so that funding, partial funding went out to some of the other PORTS. And I do not, I'm not exactly sure what the percentage was.

In addition to that I mentioned $350,000 was for spare parts and revitalizing, upgrading some

equipment. That was, we decided to distribute that throughout all our 20 PORTS systems. Actually I should say 18 because two are just coming on line, 18, so, we upgraded some of the equipment. All the air-gap systems will be getting a sensor, a laser sensor. There are some stations where they did not have spare parts. We went out and bought spare parts that currently have tide gauges and be part of that infrastructure.

ADMIRAL WEST: We have been worried about PORTS since I have been on this committee and one of the issues was, as Andy McGovern pointed out many times about the maintenance of these sites. I think this is a wonderful opportunity for NOAA to take this plus-up, roll it up to the next budget-submit and come up with a firm plan of how you're going to use and support O&M, either yes or no by installation or by percentage of hardware or whatever and you can get some money and then get an agreement so you don't have this argument every year about, you know, who is going to fund the operation and maintenance. So, take the plus-up and

roll it in and use it. Second question is, what was the technology on your visibility sensor?

MR. SZABADOS: The current system that we had out there was microwave and the new technology is laser. And we actually successfully tested the laser when we looked at the microwave. The one drawback from the laser is that when you have visibility issues, it does interfere but it provides a redundancy and for quality control it's a good backup sensor.

DR. JEFFRESS: Mike, on the visibility is it a fixed baseline you're measuring the atmospherics?

MR. SZABADOS: I'm not sure I understand the question. I'm sorry.

DR. JEFFRESS: This new sensor for visibility, right, is it over a fixed length or is it a variable length that you are measuring?

MR. SZABADOS: It's a variable length. It's on the same platform, actually the same platform as the microwave and hits the surface and bounces back up.

DR. JEFFRESS: The reflectance is off the

sea surface?

MR. SZABADOS: Yes.

DR. JEFFRESS: Good.

MR. SZABADOS: It's a direct measurement to the sea surface. I'm sorry. Did you say visibility or did you say --

DR. JEFFRESS: Yeah.

MR. SZABADOS: You said visibility. I apologize. I was still on -- I was on microwave. The visibility is a laser system, too, but it's going to a mirror and bouncing back.

DR. JEFFRESS: But it's only one distance --

MR. SZABADOS: It's a fixed, that is fixed distance.

DR. JEFFRESS: How long is the baseline?

MR. SZABADOS: The baseline, oh, we're talking, it's a short distance, we're talking within meters. So it's going to take multiple -- if you want to know the extent of a visibility you're going to have to have multiple sensors strategically placed.

DR. JEFFRESS: Spaced out at different distances, right?

MR. SZABADOS: Strategically placed, the area coverage of the fog or the visibility issue.

DR. JEFFRESS: Right. Thank you.

MR. SKINNER: Any other questions or comments for Mike? Thanks very much.

MR. SZABADOS: Thank you.

MR. SKINNER: Appreciable the update. John Oswald, on the latest from Alaska.

MR. OSWALD: Do I still have just seven minutes?

MR. SKINNER: Well, let's see how the first six minutes go.

(Laughter)

MR. SKINNER: No, John, we want to see your full presentation.

MR. OSWALD: Yeah, I was going to call Bobby Jindal and tell him to take out those Sentinels because he was going to take our volcano monitoring thing which is, I have a close association with

volcanos through a family member. I just wanted to talk about Arctic, I was just asked to keep the Arctic a little bit in front of this panel.

MR. SKINNER: John, can you make sure you're close to the microphone? It's a little --

MR. OSWALD: Is that better?

MR. SKINNER: That's better, yes.

MR. OSWALD: Okay.

MR. SKINNER: Thank you.

MR. OSWALD: You're welcome. Okay. So, maybe it's time for action. So, we'll just step through some of these things here. Just a primer on Alaska. Many of you have been there. It's big. It's quite big, twice the size of Texas. We've got 34,000 miles of tidal coastline, and the Arctic is about a thousand miles, if you just draw a line around the Arctic. That's like about Miami to D.C. or that size. There's about, in the 2008 National Hydrographic Survey Plan there was 9500 square nautical miles of the critical hydrosurveys. That's about 37 percent of the U.S. There's 310,000 of the navigationally significant

areas. That's that huge number, the 160 years or whatever. We all know because we all read the papers because we actually still have papers for a while, or online, sea ice is melting at a rapid rate.

And, I don't really want to go into that. We've seen lots of maps. You've had lots of previous presentations about the sea ice is going away. It just, it's going away. One big driver of sea lanes will open up. When? You know, about six, seven years ago it was thought it was going to be around 2040, and, I mean, it could be in five or ten years. The shippers want to have consistent movement of freight from Yokohama to Rotterdam basically to get those Rubbermaid Totes to the markets, at the Walmart store.

UNH has done quite a bit of work in the Arctic, for law of the sea, CO-OPS has done real recent work. OCS has done a recon of the Arctic last year with one individual. NGS has done shoreline mapping work, recently, repeated there, but we get these large storms, huge storms in western Alaska so you have big surges. It's low tide, big surges. Just whenever you

have the low tide atmospherics go over.

And down here we have the Governor's letter to Jack that I assume somebody in NOAA is responding to but it's a commissioner and it was a panel put together about climate impact assessment. So all these states are having these commissions to study this. And, it was set up by the state legislature. They've issued a report that's been well-circulated around the federal agencies, et cetera, et cetera. So you've got lots of studies, commissions, reports. And I just think we need some coordinated action now before it's too late.

Of course Alaska came from Russia in 1867. Look at that, March 30th. Nine days later the Senate ratified it. Nothing happens that fast anymore down here on Capitol Hill. But a little known fact -- some people here know this -- that the Coast and Geodetic Survey, the predecessor to NOAA, was very instrumental in why we're speaking English instead of Russian, because government employees were allowed to lobby Congress and they did that under the leadership of George Davidson, who was with Coast and Geodetic

Survey. They named a ship after him. There's Davidson Bank, Davidson Glacier, et cetera.

Some recent things, there's a lot of oil in the Arctic. This NPRA, that's opened under Clinton administration, the drilling, current but it was set aside by Harding in 1923. Of course you had this huge boom in World War 2 that needed surveying and mapping and after World War 2 we actually had a road to Alaska, big road. We still had just one road. So everything is coming up on ships and airplanes much.

This is an interesting date here. 1947 to '53 was the last major effort that the Office, what's now the office of Coast Survey in the Arctic surveying, hydrographic surveying to support a nationally needed project, which was the Cold War, building of the distant early-warning radar sites to catch the low-flying Russian bombers. That was a high priority for the nation. The Coast Survey responded. They spent six years doing this. And I would love to go talk to Harley Nigrin -- he's still alive -- because he was on it -- I researched some of this in the last ten

years. That was the last major charting effort and it was classified. Go read the descriptive reports on the Internet that were declassified in the early seventies, interesting.

Statehood, we're an owner state so it's different than all the other states, as the land that the State of Alaska has was submerged and, on land, is we share the revenue, the residents share the revenue; hence the permanent fund dividend. That's how that came about. So if there's mining or development on state land and it makes money, that is shared. It's called the owners. It was in our Constitution.

There has been oil exploration supported by maritime interests since 1957 to present, both in the Anchorage area and North Slope. We settled with the natives or the Feds did in 1972 and there was another thing pushed through the last, in 1980, Lands Act. And we still have one road to the Arctic. To get to the Arctic there's one road. One road to Alaska; one road to the Arctic.

And we got all these other things happening

here. We had brief briefings by, we had sort of a briefing in Anchorage, this committee here, and some of this was discussed a little bit. Molly McCammon chaired that and she's involved in the ocean observing community. In fact, she may be the Chair of the Association of Regional Associations now. And, she's like me. She comes from a non-oceanography background so she's sort of a free-thinker. Amy Holman, she's the NOAA Regional Coordinator in San Francisco last year, and U.S. Coast Guard.

So I don't want to repeat too much but the Coast Guard says they are talking their southern operations and moving to the north. They said that in your briefing. And the NOAA Regional Coordinator in the group there wrote a real nice report with lots and lots of recommendations about everything from geodetic infrastructure to tides and currents to charting to ice forecasting, et cetera.

This is why there's this misconception of Alaska. We're actually a province of Bobby Jindal's territory here. See, we're just, and Barrow got run

right over by those last two hurricanes. They moved Puerto Rico to Cuba and Hawaii's -- or is Alaska now under John McCain state or is Alaska -- oh, Hawaii is over here in Bobby Jindal's district.

And this is just an interesting map. It's wind that everybody is interested in. So we are getting warmer though. They didn't really move us. And we're actually this size, you know, everybody's seen this map. It's from, you know, down here to Georgia to the last of the Aleutians are over by San Diego. And this is an old map. It used to have 18 tide stations, these NWLONS, like for Mike Szabados's shop, and now there's 26 in Alaska; 142 in the nation, now we have 200 and something. This was a slide from about five years ago. So there's progress being made.

Here's OCS's operations for this year, and this is right on their Website, the Nautical Charting Program and you see it's southern Alaska here. The Arctic Circle is basically right up here, Bering Straits and Russia, which we can almost see from here if you look hard enough, right there, where it says

Kodiak Island. That's a leader. But there's about a hundred transits of ships into the Arctic a year according to your Coast Guard briefing but there's movement afoot.

And I just want to show some data products. You have seen other things here. This is the Red Dog Mine facility, is a tide gauge that was established in 2005, and whenever you have small tides like the Gulf Coast -- Chesapeake Bay is prone to this, too -- you have predicted tides, blue line, real tides is the red line, and green is just the observed minus predicted. Many countries do this. It's a way of data portrayal. These are real-time stations transmitting six every hour and some upgrades to six minutes in the tsunami areas.

See, here we have predominantly water above predicted. Here it's predominantly below because this is in March. This is in the summer. This is in March. And here it's just about right. It's like the Three Bears story, you know, or something. But you can see, prediction methods are ancient. You need to do what

this guy from Texas says. There are modern ways to do this, taking in other events that have errors in them, too, because weather dominates. And this is just above the Arctic Circle.

Here's another one. I don't know if people have ever experienced tsunamis here. This is Adak. It's an NWLON on the end of the, toward the end of the Aleutians. Here's a little tsunami. This is in -- typically do these in meters, and it's, yeah, this is all meters. So these are, oh, I don't know, it's a half a meter tsunami. I was driving home from work. My wife called me, said there has been an earthquake in Kamchatka, 8.2. I said, "Oh, my God." That's a big earthquake. And, so, I go home.

And the times of tsunamis are predicted real well but the heights aren't. You have to have off-shore or on-shore gauges to confirm your models. So I sat there at my computer and watched that as the tide appears and then you can click on the Japanese site and see it because it radiates, you know, a radial thing.

Sea level rise, well, right here is Skagway. This is in northern southeast Alaska and it was on Mike's slide of the nation but here sea level is actually going down. So, this is common in Minnesota. Well, Minnesota doesn't really have the sea but there's isostatic rebound. The glaciers melted so the land is like a sponge; it's just going up.

So the good news is, is that people that are in Skagway, their houses are getting farther away from the waves but the bad news is the soundings are getting shallower. So down in Bobby Jindal's district, you know, the good news is the channels are getting deeper but, you know, global sea level is changing. It's about two to three millimeters a year up, mostly due to the warming but there's glaciers, et cetera. This is about, almost two centimeters a year, right here, and this is prevalent in that area of southeast Alaska.

Coast Survey has taken a real big interest in Alaska for a long time. And this, I have this map in my office. This is Barrow, Alaska. You come down,

Kotzebue would be here and Nome is down in here. But in 1911, this guy, Harris, Coast Geodetic, mapped out from observations that he had from a variety of countries, these are full tide lines, how the tide progresses timewise, and mapped out down in the corner here the little Andromíng (phonetic) Point near Nome, Alaska, pretty major achievement. They speculated that this area, this stuff didn't fit so they speculated there was land there land there. We now know there was not land there. That's just an interesting thing.

This is an island near Kodiak that we surveyed or helped survey. OCS surveyed this -- radar and the chart with this line here and underlaying it is the Google image. So when the people in the airplane turned the lighter, the penetrating lighter they were actually flying over land instead of water and they called us up because we had actually been on land to put up a tide gauge. And, sure enough, the item was about a mile out of position. And that picture is similar to this in your Hydrographic Services, the Most Wanted List in that publication you have of another

island. But we see this with detached Islands.

Other issues in Alaska, you have just a huge area. You know, it's a survey, point spaces that's being surveyed this summer. Here's an area, cruise ships want to be to go up in this area here. This is down in Yakatak and we surveyed this portion and out in the ocean but this still remains right here there are no soundings on the chart. It's pretty common. And, we have, according to David MacFarland we have Captain Cook soundings on Alaska charts. He was a couple of OCS records ago. I don't know which soundings but he pointed out that fact.

Back to the Arctic, these are the Arctic charts that we have. They're 1 to 50,000 scale, 1947, single-beam visual hydrographic methods to support the DOD projects. But what we see in some areas, now this little point here is Point Hope. It's just above the Arctic Circle. It's been inhabited about 3,000 years. People live in houses like this, which are made out of bone and, whalebone and bear foot.

In fact, Steve Oominak lived in this until

about 1970. An engineering company I used to own, we actually moved this village, did the planning and the engineering of the village, as shown here on the NOAA nautical chart but it's actually here since 1975. It's over in this area here. It was just moved because of erosion and higher ground. And, on this part of the chart, and this is, I just I just downloaded this. You can actually see right here there's actually a sounding on that chart. So that's good. It's just hard to keep up with this. It's such a massive area.

Oil and gas, real quick here, the modern oil and gas industry, been pretty much in the Arctic in the 1960's. The discovery well was 1968 on-shore in Prudhoe, that there was, everything was taken up there with ships. So we didn't really need good charts. We just, local knowledge prevailed pretty much. But this has got a lot of people's interest, this, the $2.6 billion that went into the Chukchi Sea Lease -- Chukchi Sea Lease is here. Here's Barrow. Here was that little town, Point Hope, 600 people. So it's federal waters but the largest OCS they say in Alaska history.

There have been larger ones in the Gulf of Mexico. So it's a big deal.

Alaska holds about 31 percent of the nation's oil and gas. There's more oil in the Alaska OCS USGAS mineral management field than has been produced in Prudhoe Bay. Prudhoe Bay two years ago was providing 25 percent of the U.S. domestic supply and all of the Prudhoe Bay stuff was taken there pretty much by ships using your charts.

In general in Alaska about 60 to 80 percent of the people approve of oil development because it fuels the economy, for one thing, but there's an ongoing lawsuit on that Chukchi thing from the Navy community because of just issues with whaling.

Here's the ships that are typically, I have used, Larry's used, maybe some other people, icebreaker stuff. These are, so in the oil fields, how did we survey the oil fields? Survey the oil fields, just go over get some Canadian -- we don't have expert in drilling, hydrographic expert in this country. Now, a small contingent of Coast Guard ice breakers, the Coast

Guard was going to get a new one in the stimulus package. They got to cut it out from what I understood, $800 million. Ice breakers, you know, breaking ice, surveying, and they crush, you know, they get up and crush the ice.

And then these smaller vessels to bring supplies into the villages, this vessel I use, ARCO gave it to me, now Congo-Phillips, it's about the size of The Rainier, has a 25,000 horsepower in class four. Go through four feet of ice continuous. We can survey four feet of ice continuous and, but, what we did, your challenges are you have ice one day, there is just ice you can actually sort of navigate around, and the next day you have water and just highly variable. And that's one of the surveying challenges. We have surveys there, has been single beam, side-scan, all the color cameras, for seismic exploration.

Here's one that some of you have probably been around. It's a big thing in the water. This is SSDC. It's a drill platform and you see the derrick up here. So this is about half of a 1200 foot supertanker

that they may double hull by making another hull and filling it with concrete. So it's, and it's got a little foot so they would sink it to the bottom. So you need bottom surveys, very accurate surveys of this stuff. This is what the bottom looks like. It's like playing in the sand, just breaking your fingers, ice showers. Currently oil experts use relatively shallow water but Andy can speak to this more, where they found ice showers on the wall of the sea in huge depths, huge depths. I mean huge, I mean, 5,000 meters?

MR. ARMSTRONG: Five hundred meters.

MR. OSWALD: Five hundred meters. So the ice piles up -- the weather grinds it along. And you can see predominant, the time of the scower is predominant wind and then occasionally some of these you will see a stripe that goes across, you know, just was a different wind day.

So for surveying the oil industry you look at different things. Like Larry mentioned, this Corps of Engineers, but for engineering purposes you are looking at different types of data. Seismically you're

looking at, you don't want to set a big structure on the bottom. There's a big hole in the middle or the hull will crack so it's real important to have a flat bottom.

NOAA's three steps. Here's what NOAA did in 1947 to '53. They used these boats, built these little cabins on them. Here you see launching and I have done this with the bulldozer and small vessels, you just put them in water, because you don't have boat ramps in the Arctic. But these guys in 1947, they used landing craft to support their mobile operations. And they went out to about ten fathoms approximately, ten fathoms, 60 feet of depth.

I couldn't find a picture of the landing crafts that they used on the NOAA Website but these are the ones that we have used. These type of landing craft, this is an aluminum one here. This is actually a take-apart landing craft. It's about -- quarters, that's actually performed in NOAA hydrographic survey just sub-Arctic via Nome, mounted with a multi-beam. Here's another one. This one is supporting shell

prospects. Last year, this is up in Barrow. Here's one where a little tuggy was there, see on stilts, see, so it doesn't get flooded. But this is a common arrangement to support because you get inside the Barrier Islands. You can't take an icebreaker inside the Barrier Islands. For a NOAA ship you can't get them inside, it's too shallow, just too shallow.

Some oil field shots, this is a big thing, this oil field to the country, this oil thing that our Governor actually got in front of everybody, yeah, whatever, but it's a big revenue generator. It's been done in a reasonably environmentally friendly way now and there's more emphasis on lower impacts, the directional drilling but it takes huge lead times. The Chukchi lease, in 2007, I worked on other leases in 1982, you know, your gravity surveys and it's still not producing. Most of the projects I've worked on, development projects are still planned.

But historically NOAA has -- C&GS, what did they do to support infrastructure? NGS in 1977 and '78 or '76 and '77, they ran levels, precise first order

levels to support the finishing of the TransAlaska Oil Pipeline where we get our oil and gasoline. They did that. The entire -- suggested that OCS provide the charting in Prince William Sound. I worked on it for NOAA, first day I surveyed, the library. You know what happened there, there was an anniversary just recently.

And then CO-OPS has NWLONS at Prudhoe Bay and Valdez. And now we have a new gas pipeline in the works and everybody knows about that because our Governor talked about it, you know, nationally but I also surveyed that same route. For that pipeline it's unbuilt in 1983. Larry and I worked on that.

Mining in the Arctic, I think Andy mentioned this, the largest zinc mine in the world is just north of Katsivu (phonetic). CO-OPS has an NWLON there. Now it's the last dock before you get to Prudhoe, pretty much. And these are the largest buildings in Alaska. So, the mine is 50 miles inland and the zinc concentrate is mined and then hydrated in the mine, brought, stored here, conveyored out to an indirect loading facility, I'll call it.

And then it's put on these lightering barges, FOSA's lightering barges, they have two, and they have these nice little tugboats and then lighter it to these guys up here. They were about three miles off-shore. Because the water, you know, you need to be that far off-shore. There's about thirty Panamax ships a year take this zinc concentrate to as far places as Europe. A lot of it goes to trail British Columbia where it's further refined.

Port enlargement is planned. There's few soundings on the chart so how do they do this? Well, they have, the mine developer pays to have engineering surveys done. That's how this is done. They're not going to just not call NOAA, say give us a chart. You just do this yourself. And there's a direct loading facility planned and that's got all kind of currents and buoys and yadda, yadda, yadda on that one but it's not built because this is a mineral-rich area. It's a mineral-rich area.

There will be more mining and this is, unless you start building more roads this is probably

the way it's going to happen, is to bring it out to a port like this, seasonal port, thirty ships a year. Here is the doc. Here are waves of about twenty feet coming in, in the fall. The tide gauge that we built is actually on the other side of this, is up here. We build it up about thirty feet above the highest level of the waves. We hardened it and built it.

There will be more shipping, just this specialized shipping for mining, be more of that. Erosion, there's going to be more erosion. Everybody reads about that in the New York Times, erosion. I mean, everyone has got erosion, no big deal. It's like, just happens. But the USGS got a lot of mileage, studied erosion, they like mapping and they published a paper at the AGO Conference last year in San Francisco American Geophysical Union, New York Times picked it up. HydroInternational Magazine probably half of us get here. And on the cover, Arctic Shoreline erosion, just east of Barrow. Used to be around 8 to 13 meters a year and they documented something about 25 meters a year in this epoch of about I think 2002 to 2007. So

how does NGS or OCS react to something that's changing that fast? These are four-dimensional things we're trying to measure here.

Anyway, I wanted to mention something about culture awareness because unless you have lived there you don't, you know, it's hard to quite understand this. You walk into a store in Point Hope. This is a native corporation's name, Tikgaq store. It's a little store. And you can go in there and buy a dart un and shoulder gun and bombs and harpoons. This is, I kid you not, right out of the Moby Dick. And you have to look at this one. There is the little floats, the line. I mean, whaling, it's a big thing. This will impact the way you survey in the Arctic, I guarantee you. It's holding onto the 2.6 billion dollar lease currently, whaling in that type of issue. That's what I'm saying, it conflicts with marine surveys. This is very important.

The Eskimos, they got one foot in ancient and one foot in the modern world. And we work with these guys all the time. And, there is more whaling.

So NOAA is chartered to protect whales. Well, NOAA is going to have to deal with this issue, too. You know, there's a Whaling Commission and Walrus Commission, et cetera.

And, it's a very big culture. This is a, the one on the left is the celebration after whaling. Larry and I used to work for a company and we, eventually transitioned into a Navy boat company and we used to get these holidays. Say, what do you mean? I have to go home? Because somebody caught a whale in Barrow. It was cultural awareness for me.

Here's some of the work CO-OPS is doing in Barrow. GPS, major tides a little bit here. These are systems that are bottom-mounted and that's sort of an experimental system. We put it on the bottom and measure the pressure. And in the background here's GPS. You know, GPS can be used to measure tides. It's nothing, there's nothing to -- just the thing. And here's a nice building out here that partly belongs to NOAA, Arctic research buildings, $60 million, NOAA National Science Foundation. Realize, that's where

your tidal benchmarks are, Mike. I don't know if you knew that or not.

And that's a CO-OPS project. These are just pictures to show you, you know, we're leveling to the water. Mike mentions QC with your laser. This is an ancient way to do it. It's real good. Here's a tidal benchmark. I said in 1982 and I said it set it when it was out here. Well, actually, this shore is eroded and this actually is protected shoreline. Issues with the shoreline in the Arctic, it's got all this ice in it so it gets to spew waves, melts out pretty quick and goes away.

Here's a research tide gauge, a different concept. It's basically an inverted pathometer. Eventually you're playing around with that at the University, Fairbanks -- go to, you know, Gloucester Point in the Chesapeake Bay, you got marinas everywhere. This is a boat ramp in Barrow. So when there's ice you just pull it out. I mean, this is the thing you're dealing with, with small boat operations. Here's a small boat operation. I think that's Larry

right there. Here's another small boat operation, field barges. Airplanes, now, that's how we get to the Arctic, indoor surveying, airplanes sometimes but when you go to the Barrow Airport you just got to watch out. Carry your own bags. Got to fill up the picture. And -- show that pictures of these, that's the one in Nome but we're a contractor so we sort of have to use the background sometimes. That's us. You always have kids helping you out.

Beach erosion, it's, you know, you have seen in other pictures, no big deal. Discovery Channel has got a -- Senate appropriations on this issue in Anchorage a few years ago. There's a State Climate Commission. Millions have been spent on remediation, trying to protect some villages. And it's not uncommon, this is work we did this year on tide gauges for CO-OPS, 20 below here. We can make our equipment work at 20 below. Trying to find a benchmark under 25 feet of snow here in Kaktovik. And that's bears that are actually chasing our survey crew, CO-OPS -- but typical, you know, the 30 to 50 below stuff in the

winter, wind, snow, no light. You just learn to deal with all this stuff.

There's CO-OPS tide gauges right now in Barrow. Well, they're under that ice right now. There's more just pictures of dealing with ice and stuff. We have had late breakup and early precip last year. I don't know if you can see it, there's just a million mosquitos on this guy's back. Here's our star cook on a job, Prudhoe Bay. And she's got bare feet. I mean, we have seen 75 degrees on the north shore.

NOAA ship surveyor in the ice. I've heard that somebody towed this back one year but I'm not real sure but I haven't got independent testimony to that. We got to be careful of these ships, no ships, any ships in the area. So, I had -- and I assume this gets printed or put on your Website or Virginia has this, ideas, these are, I don't know, just ideas. For Coast Survey, you know, prioritizing emerging areas in the Arctic.

This is actually happening now, Coast Survey, right now site tabulated, got about a thousand

square nautical miles that are being prioritized, just the western Arctic not even Barrow to the border. I would concentrate on shallow water now. Deep water, I would just wait till after the ice melts. Deep water, deeper water, you got to have an ice breaker. It's just sort of cost prohibitive.

Arctic fieldwork in 2010 and beyond, I just developed a rational and coordinated plan with different entities here. Well, Steve can say that. I think NOAA has taken the ship to the southern part next year but I would also use contractors in the Arctic, been there, I have been here for thirty years, some sort of highly mobile operations like in Barrow or maybe some sort of more intense recon. You need to think about how you're going to survey. You don't need 100 percent multi-coverage in the Arctic. There's ways that are more cost effective, sedimentary, you don't have clinical -- rocks.

Best survey strategies, risk analysis for NOAA type ship operations and work with Alaskans who live there, you know, I had to learn this after I left

NOAA about this Arctic stuff. I would say you either had to ask for additional funding like the other agencies are doing this now, so if you go to, Arctic is a priority and you go there then you can't survey in Louisiana or somewhere else. You know, so, I would put that high on the wish list. NGS for Juliana, and, I have many more minor items. Much of the shoreline is out-of-date, work with USGS, BLM.

The State of Alaska, the State of Alaska is considering a hundred million dollar mapping project in Alaska, that has some real great opportunities for National geodetic Survey, GRAV-D one thing. Examine your specifications. Are they suitable for Arctic challenge? I would say no. What we're using in Potomac River is not suitable when your shorelines change in 25 -- a year. There's V-DATUM, GRAV-D and GPS for tides. That is the way to go. I'm a believer. It just needs to happen. The tide gauges are difficult to operate.

And the core density is a less important issue right now but this true sea level change we need

to get NGS, CO-OPS, everybody working together to get true sea level. Because there's so many people, newspaper editors in particular look on the CO-OPS Website and say look, the sea is going down in Skagway. Well, it actually isn't. It's just -- and, not to put CO-OPS last but continue long-term tide observations at the two NWLONS and Barrow, the Arctic stations. Again true sea level change, gap analysis report, which erodes and I think that has probably been presented to this committee, I imagine. And this is an important thing that needs to happen, have the CMTS and the climate change, all this input from these other drivers. I mean, it's really a technical report.

And, new technology, Mike talked about that, and quicker turn-around on publishing results. That would be on my wish list. Coordinated effort by, oh, and, I don't really know the higher management of NOAA and all of this Arctic stuff, that may be one executive for charting, Jack -- Jack has got all these other things here responsible for, Jack Dunnigan. So maybe that one executive for charting, I would put what

in Alaska. Most agencies don't spend as much money as this part of NOAA, has a huge number of people in Alaska, and you go down and just talk to them and they know all the issues. And there are some of agencies much like NOAA where it's more central controlled.

Be proactive on climate change. Some of this is actually in process at Office of Coast Survey. Funding requests to Congress before there is a problem so NOAA is not left behind and FAA gets the money or BLM or USGS for the -- botanical garden because we have a grant to study Arctic change.

And, this is our volcano. That's almost from my house. It's given us fits. And we have that trouble, too. It looks like a nuclear explosion all the time. It's just pretty amazing.

And I'll just sort of end with that. Anybody have some questions? Although I would like to show one thing. I don't think you saw it on the Red Dog slide but I had Russia just a little bit off that slide and that actually is a true statement because it's right next to Russia. But, so I'm at the

airport yesterday and look at our Governor, made the cover of some magazine I've never even heard of. I didn't even recognize her without glasses.

And I actually read this and, you know, whenever you know something about a subject and you read it in a mainstream publication, oh, man, it is dizzying. Arctic sea rise right in our paper -- you know, it's all these issues but you just have to prioritize where does this fit in with the Port of Baltimore and hardening. And it's an issue not, the oil industry has sort of done okay up there, getting all this stuff there but probably the biggest issue will be the Panamax ships. And pick a date, ten years, because they want to have reliable open water to do that, to take them from Shanghai to Rotterdam, because it's 5,000 miles. And how is that going to play with whaling? It's not going to -- it will be interesting times. Questions.

MR. SKINNER: Thanks, John. Appreciate your coming back and giving that presentation. Any questions for John?

MR. WHITING: Of course I'm from Alaska. I'll ask one. I'm Larry Whiting. How many times has the pipeline been surveyed from Alaska to the U.S. There's three of them, right?

MR. OSWALD: We had to switch the pipeline. So, gas pipeline, I think Larry is probably referring to the gas pipeline.

MR. WHITING: Yes.

MR. OSWALD: So we were shocked as everybody when Sarah Palin announced this, whatever. She actually stayed in the hotel where I used to cut the grass the day before she announced. I thought that was a trivia -- anyway, she put this pipeline out and all my relatives in Ohio and Georgia think this pipeline was built to spend on it. But the gas pipeline, we first surveyed that in Prudhoe to a high-pressure gas, big dimer-pipeline, Prudhoe and Alberta, 2000 miles and in 1982 to '84, then again in '88, 2003. And there was one in there about, between that.

And then now, we're actually surveying two

pipelines now. Only one will be built for only the Federal Energy Regulatory Commission, and the National something, NAV-Canada will only issue one license to build this utility. It's a utility. And, the State of Alaska has forked over $500 million to promote one entity and the oil companies have another concept right now. You know, gas prices are depressed now. Gas, you know, secure gas is needed but, oh, it's, so there's about four times this one has been surveyed. It will probably be built. It's not the "Pipeline to Nowhere" but it will I think inevitably build, you know, secure energy sources in this country, you know, we clearly see what's happening.

MR. WHITING: So that was four times on that gas pipeline at least. Now the "Bridge to Nowhere," that you brought up, how many times have you surveyed the Garden Crossing and the one in Ketchikan? Way before it was brought up in national news.

MR. OSWALD: Hey, I wasn't in support of the Ketchikan one. We won't get into politics here. The one in anchorage makes sense from a long-term, you

know, population growth rate is 3 percent. You know, a lot in Anchorage by my house is $200,000. Nobody can afford that. The average person can't afford a lot. So, and Anchorage is surrounded by water and mountains so you saturate it. Yeah, the bridge, the bridge in Anchorage was about, oh, I don't know, 1980, and then '83, four, five times.

Big projects, you know, there's quite a bit of lead-in time. But the bridges across the Mississippi River, you know, New York Times, they were called "Bridges to Nowhere" because the west is -- need more expertise in ice. There's ice and water business. And if you can get some of that from the Coast Guard like they did last year and this committee made a recommendation of something along that line I think at the last meeting.

But, it's hard to think about something that's so bizarre as Alaska from inside the Beltway sometimes. I come to the Beltway, I feel like a kid with big eyes with all the things that are happening here but it's an interesting place to work. And this

NGS project -- I have to say this -- and the surveyor was here but that is from NGS perspective one of the most things for Alaska to solve our vertical control issue in Alaska. It's unique in the United States. Gravity-D, it's the highest priority in the nation, is pretty much on their proposals but in Alaska it's just a matter of money, you know, funding.

MR. SKINNER: John, one question on the offshore oil exploration, you showed one map with a blocked-out grid. Is there any requirement for a company or a consortium to provide data on those areas to the state or the federal government? I know in Massachusetts when we have off-shore projects, they are required to provide data and, you know, a set format, so forth.

MR. OSWALD: The ones I have been involved in over the years, there was not for the hydrographic survey standpoint but -- Larry probably was involved in this too -- about four companies ago in 1982, Anwar was open. Anwar is the eastern corner of the state. It's got the biggest potential oil development volume in

North America and it is actually set aside for Congress for exploration.

Anyway, our company at the time went in there and did a speculation gravity survey, gridded points to look at the geophysics of the eight to 10,000 foot depths, gravity survey. Now, that data through, and that was done under the Bureau of Land Management, and USGS authority on-land exploration, federal land, and we had to turn over the raw data and the processed data but not the interpreted data. Different kind of dataset but similar -- and do you know the offshore, some gets turned into MNS but it just sort of goes to MNS.

MR. WHITING: Yeah, the MNS surveys are typically single-beam and side-scan with sub-bottom. You're looking at the bottom but you're not looking for real depths as in, or safe depths. But they do have to have a survey, basically around the planned site by about, oh, 500 meters, and then beyond that it's on a, about a thousand meter grid. And it doesn't have to be multibeam. It does have to be side-scanned and then

that data goes somewhere. I don't know, whatever happens to it.

MR. OSWALD: The oil companies typically, like I have been working on the Stinalie (phonetic) pipeline for one of these, Prudhoe -- the geodetic survey I'm doing. It's like -- that's about all I can say about it. It like oil companies, it must be top-secret. And the marine surveys, the TOAS surveys it was sort of like top-secret. You're not supposed to, you know, you can't release any data.

MR. SKINNER: I forget how we did it but there was the same concern in Massachusetts. But it seems to me, the mantra is sort of map once, use several times, or whatever it is. I guess I don't say it enough so I haven't memorized it. But I think that that, I would like this panel to consider that as a potential recommendation, that if there's such a need in the Arctic for hydrographic data that we should be looking at ways to get it. It doesn't necessarily require a huge mobilization of NOAA-based forces to do it. Is there something I'm missing or is it really

just the fact that a company loses a competitive advantage?

MR. OSWALD: It's not the companies. It would be the off-shore leasing folks. It's federally done. Talk to your friends at the Federal Management Service --

MR. SKINNER: I guess that, and I was hoping we can try to refine it because I don't know enough about the topic but it seems to me that we might want to take a look at that as a potential recommendation, that if MNS or any other agency has this data or if there are efforts in the future to acquire additional data that there be some requirement to acquire the data to a certain standard that can be used by as many people as possible.

MR. OSWALD: Does Curt Loyes (phonetic) still work for NOAA? So in the federal government arena there's something which they call the marine boundary, working group, something like that, mineral management and NOAA and others, and, I was trying to actually promote some high gauge issues a few years ago

and that person, well, previous to Curt, said no, we don't need tide gauges in the Arctic. We have this from a boundary standpoint. So that might be an appropriate first start on it.

But, yeah, I totally agreement. I mean you're going to cut out these consultants. I mean, this pipeline that we're working on now, I kid you not, we can potentially, we're hired by one oil company and I'm trying to get hired by the other to do exactly the same thing twice because they won't share data. That's very prevalent in the oil industry, when the oil companies own, it comes from the geophysical, you know, we own this oil.

MR. SKINNER: Let me just be clear. I wasn't trying to limit the amount of contractors working on this issue. I was trying to prevent them from doing the same job twice as you mentioned.

MR. OSWALD: Well, if you did this, you know, we could go survey something else. You know, we need to come up with innovative ways to, you know, meet our missions. I mean, everybody is challenged.

MR. SKINNER: Ed?

MR. WELCH: Tom, what this gets into is the fact that the Minerals Management Service collects huge amounts of money in these lease payments and then eventually if somebody actually drills and produces, then that private sector entity gets certain financial benefits. But somewhere in the process somebody says to NOAA we've got to have marine services up here before these areas can be fully developed so you guys go up to Congress or get an appropriation to do whatever the proper surveys are up here in the Arctic. Meanwhile, there's that $9.6 billion that's going into the Treasury. If there was some kind of preexisting arrangement between NOAA and in MNS that there would be a fund transfer to pay for specified services that were directed as a result of Arctic lease sales, NOAA would be far out ahead.

MR. SKINNER: Other questions? Thanks, John. We're running a little bit behind schedule. Probably my fault, I had to make a couple of calls over lunch. I did note that no one particularly objected to

the fact. But, we have run behind schedule a little bit and, just, we want to break now or go, continue? Every one all set? Keep going? What's that? Break? Short break for like ten, fifteen minutes. Is that okay?

VOICE: Ten.

MS. BLACKWELL: Seven to ten.

MR. SKINNER: Seven to ten. Seven-point -- what's the sea level rise in Baltimore? 3.08.

(There was a break in the proceedings.)

MR. SKINNER: We're going to try and get started again. I'll note that for those of you that had a snack during the break, some of the ingredients probably came from the Domino Sugar Refinery in Baltimore here. So, just to show how important Hydrographic Services are, you would be exhausted and hungry if it weren't for the services here. We're going to get started again. There has been a slight change in the lineup here. We're going to be hearing about NOAA's next generation strategic plan so Paul, if you're ready, we're ready to hear from you.

DR. DOREMUS: Wonderful. Thank you very much. It's a great pleasure to have the opportunity to be here today and to talk to you about, to kind of step back from the immediate focus of your domain, in hydrographic services as it is broadly construed and to look at that in the context of NOAA's overall planning effort. We're facing now with under new leadership the opportunity to recraft NOAA's strategic plan and we're in the middle of launching that whole enterprise and input from this committee along with our other federal advisory committees, will be most valuable in that process. We were discussing briefly over the break, in my view the various federal advisory committees that serve NOAA are a phenomenally powerful mechanism for NOAA to understand the composition of needs, emerging trends that we need to respond to and stakeholder needs and interests as they're evolving for NOAA. This panel serves that function in an exemplary fashion in my view. And for me it's very, very exciting to have the opportunity to introduce to you very early in the process how we're thinking about developing NOAA's next

generation plan, what its attributes are, what our approach is and how you can contribute to it.

I'm going to try to step through several elements of this briefing. There's really four dimensions, why are we doing this -- a very simple question to answer in many respects but not bad to start with -- and then step into a very brief, a very cursory look at some of the major trends that we're looking at, and that's one area where we would like to solicit your input or offer the opportunity for you to provide input on long-term trends and challenges facing the organization, facing NOAA as a whole.

And one of the attributes of this Next Generation Plan is we are trying to push the timeframe out. This will ultimately be a plan that will be endorsed by and implemented by the new administration but we feel that it's very important given the nature of NOAA'S services, given the timeframes that we work on, in terms of the impacts that apply to or are derived from our services to really extend the timeframe out. And I know in many of the industries

that you all either represent or are connected to in some fashion, thinking in Decatal terms is hardly an unusual thing, and I'll refer to some of these longer-term trends and use of scenario-based techniques to think about how the world might evolve and then consequently ask how robust is our strategy. And we're ultimately soliciting your input and assistance in that process. That's the business about how we plan for an uncertain future and how you all can contribute.

So to try to step through this quite quickly, and I know that you have had some schedule changes here and I do appreciate your adjustment of the agenda to accommodate this presentation. I want to try to step through those sections and make sure that we have adequate time for good discussion.

So, the fundamentals of planning should not be at all foreign to this group. Not only are we doing this to respond to a change in administration and allow the articulation of new priorities that have come through that a process but in terms of our fundamental long-term business responsibilities as a public

organization, making sure that we're well-integrated with and well-connected with the evolving needs and concerns of our stakeholder community and also able to look at the organization in the context of major long-term trends that will shape both the demand for what NOAA does as a whole but also how we we'll be able to respond to that.

It's also a requirement, it's a federal requirement that's on the list as a reason but I think the fundamentals are really captured in greater detail, in this slide, the benefits are well known in terms of the internal organizational alignment around a set of strategic priorities that are cross-cutting for NOAA. But this is the piece that I kind of want to emphasize here because of the nature of your function on behalf of the organization, really ultimately getting to this issue of codifying the shared priorities of our stakeholder community and of our organization as whole. We view that as a central element of this Next Generation Plan. It really exemplifies a curve or a growth path that NOAA has been on organizationally

ranging from a collection of component pieces in early years to recent years of trying to pull together integrated approaches to complex service requirements that cut across our line offices, cut across our different mission domains and moving into an arena up in this top quadrant that we're calling for full strategic alignment and that's one where you have, as much as is possible, a full and integrated approach to planning with other organizations, other federal organizations in many domains and other nonfederal organizations as well.

NOAA, as you all know, has a complex and varied set of mission requirements, many of which we can only implement through collaboration with other agencies and with a variety of different types of partners. In the brief period of time I was able to listen to some of the preceding conversation, some of those other partners were mentioned several times in the course of this discussion.

So, we're kind of self-consciously trying to evolve on this path, like lots of other federal

organizations, and this is an important point of conversation for me with our other agency partners, because many of the broad-based challenges that we're facing, environmental, prediction and forecasting challenges are increasingly complex, have multiple drivers and the national solutions really need to be national in nature. And I think that you're starting to see the broad federal enterprise trying to grapple more cohesively with some of these types of challenges.

So those sorts of factors have shaped our really rudimentary design criteria for the Next Generation Plan. It will have the classic attributes that you will see in terms of the document itself, mission, vision, long-term goals, nearer-term objectives on path towards those goals, and the functions and capabilities that are required to execute them.

But this element of really deep integration with our stakeholder community is a key piece of it that I wanted to emphasize. We're not only articulating new administration priorities, we're

putting it in the context of long-term trends, long-term opportunities and challenges that we collectively face. And fundamentally I believe that that's our kind of responsibility as stewards of the NOAA mission to apprise our new leadership of the long-term implications of their near-term choices. And that fundamentally is why I'm here today, is to elicit your assistance in that. So if we do move our timeframe out -- I'm just trying to go forward one slide. We're "frozen in time." I'll continue. Maybe you can see how that unlocks.

But I'm going to move to the next section and really give a thumbnail sketch of some of the major trends that we're trying to include in some of our external environmental scanning, which if we go straight ahead -- let me see if this works. Very good.

Just to give you a sense of the breadth of our field of view, when we talk about a 25-year future, which is the context we're setting, the external context that we're setting for NOAA's strategic plan, I use this very often. It's just a rubric for climate

and major environmental changes that are associated with it. And I would include with that major societal and economic changes. You're looking down here at the Arctic and I just had the benefit, and I'll describe in slightly greater length going forward of participating in a regional forum that we held in Anchorage that brought together a very diverse stakeholder community and looking at a lot of trends that are associated with or driven by changes in the Arctic climate regime over time. And, the nature of this trend is very, very real to them. In that community it's not considered to be a "whether", it's a rate question. And indeed, if you look at the Arctic Marine Navigation Commission's scenarios that they developed, four different scenarios going out 50 years, they pretty much took the same assumption. The question was rate of sea ice loss, not whether it would happen or whether it would even necessarily rebuild at some point in time.

The other point that I want to make, and it's a theme throughout here is that when you look out over long timeframes -- and this is going out further

than we are. We're kind of in our timeframe looking out to 2035. Most of the things that I'm going to be pointing to here have two common attributes. These are trends that have very high degrees of uncertainty in terms of how they will actually play out and with that uncertainty is very, very high degrees of impact. And this exists not only in environmental domains in climate where we have a lot of underlying reasons to have high degrees of uncertainty because of the nature of our difficulty of predicting these complex changes but certainly, as has been very, very heavily emphasized in the literature recently in a lot of the public debates, we should be looking at the most, the full spectrum of uncertainty and the types of impacts that are associated with the so-called tails, the "fat tails," and I may mention some of those things are going forward.

Complex set of changes, all kinds of implications, not just environmental, societal, business, economic are being driven by fundamental changes in our climate. And that's one area where we

have to really think of different ways and different rates of evolution with different types of impacts over the planning period. There's also a lot of different kind of different sectoral trends. We kind of pulled this straight out of your own content. There's a lot of different trends that you could look; in industrial sectors, some of these sort of things are on a fairly well-characterized path but the context for the transportation industry when you look at it over this timeframe has a range of other types of uncertainties associated with it that apply to a lot of different types of businesses, international maritime governance sorts of issues, governance issues broadly construed in terms of, think of the range of disputes that currently exist in the policy arena in the Arctic that are currently being discussed, the whole array of factors that will shape the rate of demand for and the nature of the kind of structure and functioning of the global transportation industry. So that's something where your expertise could help us characterize things a little bit better.

Looking and, you know, just crossing into the fisheries domain, we're putting up here just a, you know, a glimpse of some of the long-term trends in the levels of exploitation. Not only is there a great deal of uncertainty about where we're going to end up over this kind of timeframe but the other thing that I want to point out here is the global dimensions of this sort of challenge. And we often use -- I'm cutting it out here but we often use another graph that shows the adherence of nations, of the whole array of nations to the food and agriculture organizations' standards for sustainable fishing. And there's two fundamental points. Most, more than half are failing and even the best nation's including the United States are only implementing at a level of 60 percent. This is a global problem. It's a problem that's not just an environmental and management problem. It's a complex governance problem as well.

Other aspects of the climate domain, global precipitation levels. We're looking at drying trends, warming trends, great deal of uncertainty out of our

timeframe in terms of weather impacts of climate as well as natural variability and also really key economic sort of factors. And I'm just wanted to mention a couple of things here. I want to make sure that we are looking, when we look out over this time period, not just at environmental trends, not just at trends that are rather narrowly directed at NOAA's mission functions, like our fisheries management functions, but at the broaden environment that NOAA exists in as an organization, huge degrees of uncertainty about how the global demand for and supply of energy will evolve over this sort of time period, not just environmental impacts, significant economic ones as well.

And one of the other key things that is really a daily issue for all of us in a way that you might not have expected a year ago is the rate and direction of our response to what's been one of the most profound economic dislocations that we have seen in many decades. We're looking at here at the kind of long-term trend in the Dow, and every time I do this

briefing we update this number and it started, when I first did this we were in the 9,000 territory and we went down to 6 and now we're back up to 74. It's actually hit 80 recently. It's moving all over the place. High degree of uncertainty in terms of the near term but I'm really looking at the long-term trend here. You've got your tech bubble collapse, housing bubble, major collapse there. The nature of the response is unprecedented. We have had something on the order of more than 7 trillion in wealth erased during this time period in the U.S. economy alone. On a global basis it's considerably larger than that. We have had unemployment loss at a more rapid rate than any other recession since the Great Recession. So about, the last I looked, 3.2 percent of all jobs in the United States have actually been lost during this time period from October of '08. And they've evolved in such a way that a lot of economists are looking not just at job declines but firms are exiting entire lines of business and it creates a great deal of concern and question about the composition of economic growth out

of this path. It's not just going to be rebuilding inventories, rehiring an existing kind of industrial footprints. And traditionally when we've gone through these type of dislocations in the past it has really been an innovation-driven, sort of change in the composition of the economy that's pulled us out, whether it was the tech-lead thing or the innovativeness of the financial services sector in these two bubbles. We are hoping that we get the regulatory regime right in a way we don't have a bubble-lead inflation but a genuine innovation, but a genuine innovation and growth-driven path out of this which might have a significant environmental dimension to it.

A couple of other key aspects of this. It's not just the composition of economic growth and what type of economy with what type of energy use patterns and what type of environmental implications, significant uncertainty there but also a considerable uncertainty on our favorite topic, Washington, which is the budget, our fiscal posture at the federal level, a

major contextual factor for NOAA and any federal organization.

This was CBOs recent estimates versus the President's, a lot of debate about your growth estimates. But the big thing to me is just the profound level of decline that we're having here. Looking at deficits on the level of 12 percent of GEP (phonetic) is a really unprecedented level and again this just creates a little bit more of a focused type of uncertainty about the path out of here. We have always lived in an environment and NOAA has lived for many years in an environment of constrained resources. The entire federal government is on a path right now that needs really some fundamentally different ways of really thinking about the allocation of public resources, and a great deal of uncertainty again about how that is going to evolve.

The other aspect of this economic decline, that's very interesting, too, brings in another dimension that we're trying to look at, which is social attitudes towards the type of things that NOAA responds

to. And this is just again a quick rubric to give you a sense of the level of uncertainty and significance of public attitudes. Well before the collapse of the current recession, you were seeing a distribution where at least environmental issues, which were using roughly, as I guess it's kind of a surrogate level of interest in types of things NOAA does, was at least in the top ten. And we are always, we have been monitoring this for many years. It never gets into the top three. But one of the things you've seen in the recent environment starting in September, it completely dropped off the list. You have had a change in the composition of the top-tier stuff from foreign to domestic issues, and really the whole focus here is where you would expect it to be.

In that kind of context it does raise questions about the nature of society's interest in and both ability, willingness, awareness and attentiveness to the types of issues that we're trying to address. Again, high degree of potential impact on the organization, very uncertain evolution.

You could broadly put these things -- you grabbed me twice there -- you could put these things on a variety of different spectrums and I'm just putting this up to indicate the breadth of our thinking and the range of potential outcomes, not just on economic factors but also energy demands, supply, what the actual rate and direction of environmental indicators related to climate and others are, management practices, governance regimes. You can look at one extreme to another and they're equally plausible.

And all of these can interact in complex ways, even over the limited time period that we're looking at, 25-year time period. All of them are significant to the organization and we're sitting here with a strategy that at the highest level looks like this, with our current mission-vision and set of four mission goals and underlying infrastructure goal. And the question sort of that we need to answer for this incoming team is, do we have a robust strategy? Are we well prepared to deal with these types of factors as they might evolve over time?

And our approach to doing that I hope would benefit from your contribution along with many others on these three fundamental questions. These are the questions we're asking ourselves. We are putting these questions out to our staff, to different levels of our management and leadership, to our advisory committees, our external stakeholders at multiple levels, and not just in Washington.

We're going around regions -- as I'll describe in a minute -- to try to get a really robust sense of what people are really concerned about, how well are we thinking about long-term trends, question one, that will shape our future, what kind of things are relevant to you and your industry, you and your line of work and what do you think that creates in terms of opportunities and challenges for NOAA in it's its line of business or the NOAA-related component of your domain, and fundamentally at the end what do you think the NOAA should start to accomplish over this time period, what fundamental outcome should we be pushing, not just what are our fiscal needs, what

service needs need to be enhanced but what will be the fundamental impact of that on society, on economy, on environmental conditions that we're trying to affect.

And this is really a starting point for thinking about the long-term trends but also starting to frame what's the range of potential response strategies that NOAA can consider, both long-term and then in the five-year period leading, kind of our step in that direction.

So given this timeframe, 25-year timeframe, and the high degrees of uncertainty on all those different dimensions that I was talking about, how do organizations cope with that? And, we're adopting an approach to at least cultivate long-term strategic thinking both within the organization and with our stakeholders that is rooted in a scenario planning methodology that's quite well developed in a variety of different sectors, been around for decades. It is just a starting point of our planning process, a way to deal with complexity and uncertainty over long timeframes.

Nobody can predict the future. We're not

trying to come up with alternative predictions or define the probability space. We're trying to create challenging ways of thinking about how the world might actually evolve and then looking at our strategy against that. It's a kind of a business discipline, if you will, that allows us to grasp these types of issues and be able to constantly monitor, decide what to monitor, monitor things over time and understand what the potential range of impact might be for the organization.

I also think, personally, I don't have it up here but scenarios can also be a very powerful device for casting the relevance of an organization's work. Many of the choices that we make now have a significant bearing on what direction many of those trends actually go in. And that's part of what I think this type of scenario discipline can help us do as well.

I borrowed this thing from The World Bank, that's also used as a mechanism and has developed some very, very interesting material about the rate and

direction of issues related to global economic conditions and societal conditions that they address. And this very nicely captures in one shot how to think about scenarios, again, that they're not really trying to define probabilities, they're not what we want to happen in the future, which is a very common bias in planning. You cast the future in the terms that you would really fundamentally like to see; they're kind of normatively-driven. They're not really driven by a theoretical construct. They're really trying to explore the range of the possible. They're plausible stories about how these complex sets of variables can fit together in a logical way. There's plausibility tests. You want to be looking at things that are realistic, not wild, out of the box, wild card kinds of scenarios but things that are really within the range of our knowledge.

You could see atmospheric carbon concentrations going in different directions based on a variety of different trends. Well, what's the range that's plausible? Likewise you could look at things

like we were talking about earlier, sea level rise, rate and direction of Arctic and Antarctic ice loss and things of that nature, and think through their implications, again within the realm of the possible. And that's mainly the goal. They are exploratory and they're used to really test hypotheses and really challenge our own conventional thinking about how the world is or should work.

A very common technique that's used, Shell was one of the early well-known adopters. Their scenarios are quite central to their long-term planning and they use them in public fashion and you can get access to these, that they use to really try to drive home the implications of choices that we make now about long-term energy use patterns and their kinds of societal, environmental and economic impacts. They have these two scenarios, one scramble and one that's blueprints, where there is concerted action, starts in the near-term, and that helps them think systematically not just through the range of things that will shape energy use patterns in the future and constantly the

environment that Shell will work in and what the energy sector will look like twenty, thirty years out. It also allows them to have the type of stakeholder engagement that we're talking about so people understand what their kind of collective interests are, if you will, in the energy domain.

Looking closer to home in a sense in terms of federal government, the National Intelligence Council every four years does a broad-based geopolitical, environmental -- geopolitical set of scenarios that they use for the geopolitical briefing for the incoming administration. This was developed for the, what eventually became the Obama Administration. It was indeed used as some of the fundamental briefing material to put some of their choices in terms of both foreign and domestic security into context. And there's very interesting -- I highly encourage you to look at these, the very interesting actually environmental dimensions. And there's a lot of concern here about the impacts of long-term environmental changes and what that might mean for

international security, domestic political stability in different parts of the world.

Just examples, all oriented towards in different organizations, fundamental questions, how do they help you answer a question; we're using the scenarios to answer, what should we really be targeting as our range of kind of our vision for the future and casting of our mission and our long-term goals and what should we be doing in the next five years with that long-term view of the future in mind. That's what we're trying to get to and the scenarios are a starting point to do that.

We have spent some time inside the organization, crafting some scenarios. We're going to make them available. They're in kind of final edit stage now. This and some of the backup material in my slides, which are available to you, sort of cast what they are and they range -- we give them titles that help you remember sort of what the dynamics are but they range from a scenario where we're looking on different, different sort of axes of how the world

might turn out, economic, kind of in terms of governance regimes and in terms of kind of societal and environmental interactions. Those are all relevant to us. And we looked at different combinations, used a cross-cutting team inside the organization representing our different lines and kind of different mission domains to think about how the world might evolve and to develop these sort of plausible scenarios that we could then use as a reference point for our thinking about the future.

And they show things from, ranging from efforts to really concentrated efforts to develop smart growth types of patterns, as we're sort of broadly calling them, and a lot of investment alternative energies, sample production modes but still in particularly over the mid to the long-term piece of the scenario, still the very considerable climate-driven environmental disruptions and dislocations that create the fundamental questions about change in strategy at the national and international level.

We have another one that we've broadly

labeled Green Chaos, where we have an interesting convergence of fundamentally private sector motivations to invest in alternative technologies in sort of new sectors that are, could broadly be construed as green in a sense but you don't get any considerable development, unlike, in Too Little, Too Late, at the opposite end of the spectrum you don't have a lot of cohesive action at the international level and among the different levels of government and governance in the United States and so you have a very limited kind of domain for policy-driven coordination on data-sharing on a variety of other observation-related environmental scenes. And you have a nice convergence of societal and private environmental, environmentally beneficial private actions even though there's a fairly disorganized governance, sort of response to that.

And Carbon Junkies, I guess you could consider the darker of the scenarios where the nature and depth and prolonged nature of the economic downturn kind of forces a reversion on a global basis towards really kind of a reindustrialization where you have

particularly in other parts of the developing world, very strong and high rates of growth on an industrial pathway quite similar to the advanced industrial states and no pricing and very little attention to some of the environmental spill-over benefits and you start to see some fundamental impacts from that mid to late in the scenario as a result.

So that's just a very unsatisfactory thumbnail sketch. I've got some slides in the back that provide a little bit more depth on each of those. And I'm going to talk about probably how the panel here can weigh in not just on these long-term trends but also really what you think NOAA should be thinking about and setting as our long-term goals.

We are at an early phase in our five-phase development of a plan. We're right here in the spring where we're trying to connect not just with our internal leadership but also with our advisory committees, cooperative institutes, all kinds of formal and semiformal external stakeholders. We're also having our regional teams conduct stakeholder sessions

in the field so we get regionally distinctive views of trends and potential implications for the organization. We've got a synthesis phase inside the next, in the summer and these timelines will likely, you know, these hard lines are likely to be, we'll probably, we'll be gathering input I'm sure in this kind of analysis phase.

We're going to be trying to cast the fundamentals of the plan here and then going back out to all the sources of input with the document itself so we can have a final review and a great deal of the formal usual forms of external coordination but we want to make sure we're hearing at the front end as well about what we should be considering and then you will be able to see where it came out at the end and have a point of comparison to the comments.

This next slide really just shows how the documents evolve. And I really want to get to quickly a couple of points here. We're going to use all these sources of input including from our advisory committees as they are inclined to engage and then we're going to

have this review process where we also include this entire community in the public review phase. And it really comes down to I think these options for you to consider. It's back to our three questions here. You can participate either directly. We're putting up a Web-based mechanism for soliciting input from people directly or as groups on those three questions. You can also participate directly in regional events if you're located in different parts of the country to help us address those three questions.

As I indicated, we have crafted a more extensive scenarios document and for those of you really interested in getting into system of the in-depth dynamics in thinking about those things, there's also the opportunity to look at that document and comment on it as and then fundamentally at the end during the formal review phase.

These are not mutually exclusive things. I would assume at a minimum that you all would want to do the formal commentary process but I certainly would encourage you to think about providing your input

either collectively or individually in this front-end process so we can make sure that we're taking into consideration the sorts of things that you all have focused on in your lines of work in the same sort of context.

That's fundamentally how I wanted to leave things today, with that in a sense open invitation to contribute to this process and I look forward to any types of questions you may have about how this could work and how we could make the interaction mutually productive. Thank you.

MR. SKINNER: Thanks very much, Paul. As we sort of listened to various stakeholders and have presentations, we start drilling down on the issues that are presented to us. So it's very useful to be brought back and in effect be forced to think about, not against our will but think about the broader picture and in some ways, different ways of looking at not only what NOAA is dealing with but how NOAA is thinking about the future. So that's very, very helpful. Thank you. Any questions or comments for

Paul? I think we're still processing a lot. That's a lot of information.

DR. DOREMUS: It is and there is, you know, this is available and, you know, I think some reflection on the scenarios themselves as individuals sort of think about what are some of the major trends that we're considering can be a very helpful thing. When I talked to our science advisory board and presented very much the same -- it was really quite similar to this, just changed a little bit of the external trends that we happened to highlight -- we're asking them to contribute to the same questions.

And, interesting, there were a number of folks on our science advisory board that is our advisory board that probably has the broadest scope, if you will, of all off advisory boards. They were very interested in how you can use scenarios to think about what several of them are calling nodal points and really strongly encouraged to use this kind of dynamic and way of thinking in broader policy discussions. A lot of folks are really grappling -- and I got this as

well from our Cooperative Institute Directors -- are grappling with the issue of complexity in a lot of the types of conditions that we're referring to here, and about the significance of some of our near-term policy choices on these long-term trends. So it is a, it's a challenging thing to do and I have been sort of encouraged by a number of folks to take this and this mode of thinking into these broader policy domains. It might be something that would be helpful looking at the broad array of demands for hydrographic services from multiple -- as I was talking with Steve earlier today -- from a whole array of different types of users and think how that composition of demand could change over time, think about how the technologies could evolve over time, think about how the types of organizations that could be involved both in producing or distributing information that helps to possibly fill some of these gaps in the future. It can be a very helpful way to think about with high degrees of uncertainty again and very significant service domains with high impact to think about how the world might

evolve. And there are ways for us to sort of capture that from this group either at a collective or an individual level or at least start participating in that type of discussion, I think it would be beneficial for us for sure.

MR. SKINNER: We normally do a meeting summary in the form of a letter to the NOAA Administrator and try and capture some of the comments and recommendations that we've heard from the stakeholder panels as well as the overall recommendations from this panel. And, I don't know if that would serve as a way to convey some of the information that this panel gets or recommendations that we have for the planning purposes or if there's another mechanism. I'm not quite sure how we plug in to your process.

DR. DOREMUS: There's, you could provide input directly through our kind of Web-based link or through any of these stakeholder events or any other manner of your choosing, which includes communicating directly to the NOAA Administrator, which I certainly

wouldn't discourage you from doing. We would certainly get that through that channel as well. And I think that's an appropriate level for this panel to be conveying their long-term views and concerns about.

MR. SKINNER: Can we "cc" you on our letter?

DR. DOREMUS: Absolutely.

MR. SKINNER: Okay.

DR. DOREMUS: Yes.

MR. SKINNER: And I think that for the panel that the idea of thinking about what is likely to happen in the future, we tend to focus or we have been focusing on sort of the current situation with our stakeholder panels. And I think you brought up a good point about thinking about what some future needs might be and what some future, not just needs based on what currently is going on but how technology and industry and commerce and other disciplines are going to be evolving, thinking about that a little bit more as we come up with recommendations. So I think that was very helpful to sort of raise that issue.

DR. DOREMUS: Indeed, and I actually have a reason for emphasizing the technology piece. In my personal view I think that's one area where NOAA could learn not the most but could do a much better job than we did with our fairly short process of developing these scenarios. The one area where I feel like we did not do as good a job as I would have liked to have seen is in really thinking, I mean, over a 25-year time period thinking about the range of different potentially disruptive technology developments. And I mean disruptive in a sort of just change sense, not in a pejorative sense at all.

And we have been benefiting enormously from talking to people in a variety of different technology-intensive domains about how things might evolve that would affect our, you know, the nature of earth-observing, the ability to assimilate information to model, to get predictive information out to people and connected to people in ways they can assimilate and use it readily and quickly, and, in a simple sense our kind of core line of business. And that's one area

where I would really encourage people to focus, that I think that we would really benefit from. Certainly there's others that are particularly sector-specific but that's one that I think would be something that I would personally feel like we'd have a lot of opportunity to incorporate in our trend analysis.

MR. SKINNER: You missed this comment from this morning but maybe NOAA can be a paperless agency by the year 2015. Any comments or questions? I think -- Admiral West and then --

ADMIRAL WEST: Paul, when does the new administrator, when does the new administration see all this and when do they get their input to this? I mean, Obama's made a big deal about I'm going to use science instead of politics to make decisions now.

MR. PAUL: Yeah.

ADMIRAL WEST: And I never saw where you go back to Jane or the new Commerce Secretary or OSTP or wherever and say are we on the right track as far as the Administration is concerned.

MR. PAUL: Yeah.

ADMIRAL WEST: Or do you do that and then hope it's okay?

MR. PAUL: Well, we got a lot of this in motion really trying to prepare the organization to move quickly in responding to new administration's policy priorities and trying to inform them. I view it as in a sense a dialogue. And we have had initial discussions with the new administrator, with Dr. Lubchenco. I'm meeting with her formally on Friday. And, I think she broadly supports this process. And one of the things that I can't promise but would like to see, right now up to this point in time we have been able to go out and we have focused on going out, with what is fundamentally a pretty inductive process. We're in a learning mode about what the potential challenges are and what NOAA should strive to accomplish. It could very well be the case that there are fairly well-formed or at least formative, a very strong sense of strategic direction that's coming out of this administration. I think it's been fairly well-articulated in the climate domain. It has

implications across our entire mission portfolio and it's quite possible we might be able to get some fairly well-cast signals that not only do we go out in regional events and through other types of engagements and ask these open-ended questions but we also ask how would this type of response serve these longer-term trends and challenges.

It remains to be seen how quickly that gets cast but it might at minimum get cast through this year-long process of reframing our strategy. I think there are some statements that Dr. Lubchenco already has made that indicate a lot of concerns that she has not just on climate-driven issues but a range of other fundamental NOAA mission responsibilites.

So we may have a little bit more articulation as her team gels. She's in place now but the rest of the team is not. We don't have an Assistant Secretary. We don't have Deputy Assistant Secretaries, and I think we're still in kind of a formative phase as far as the new administration goes. She's been in place for three weeks now barely. This

is her third week, I think. So, but we fully, we're going to get a very concentrated sense of the pace and direction that she would like to take this starting this week. Did that satisfactorily capture your -- yeah.

MR. WELCH: Paul, Ed Welsh. Does your strategic planning for 25 years out assume as a given that there's going to be a NOAA in 25 years or there's going to be a Department of Commerce?

DR. DOREMUS: Some of our scenarios look at different things. It's interesting you say that. We, in a couple of our scenarios there is the complete reconfiguration of federal environmental agencies into a Department of the Environment where in that context NOAA in a sense could be thought of losing its current or distinct organizational identity. And we also thought about in the variety of our discussions and our internal scenario development about areas where NOAA's success could in effect put it out of business, as it were, where we'd see a change in the composition of those services that we developed and delivered, as

other types of attributes and capabilities develop in other organizations and in other sectors.

So, yeah, we are thinking about that and if there are areas where the current provision of services can be done more efficiently, effectively or at least at an equal level of quality at a lower cost by other organizations, it's our fundamental public responsibility to make that happen. You are already looking in our own domain of hydrographic services at mixed models of, in a sense mixed private-private models of asset use and of survey and date-of-delivery types of technologies. That mix could change over time. It's something we should be thinking about.

MR. WELCH: Well, thanks for that answer. And I don't mean to be too, throw too much cold water over your process but, you know, if you look back 25 years as opposed to looking forward 25 years and you say what would people have said were scenarios in 1984 for what is happening now, people would have missed a lot of boats.

DR. DOREMUS: Absolutely.

MR. WELCH: And people would not have probably anticipated the huge rise in the Hispanic population of the United States and, you know, personal computers and the Internet, that wouldn't have been on most people's list of scenarios. So, you know, 25 years is a long way to predict. I mean, a decade or 15 you know, trends in motion now are likely play out and that type of thing.

DR. DOREMUS: Right.

MR. WELCH: But all sorts of intervening events that nobody predicts are going to happen between now and 25 years, nobody would have, you know, ten years ago nobody would have predicted the whole federal government would have reorganized itself into a massive Department of Homeland Security. So, you run some risk about focusing too far out.

DR. DOREMUS: Yeah, that's a point that we certainly appreciate and there's debates about how far out do you go. But a key thing that I want to emphasize in response to your question is that I don't think any of these scenarios are actually going to

happen. The bigger point is there is no way to assess any degree of probability to any of them. And, they are not intended to be predictions and I wouldn't expect 25 years from now to actually see -- you know, it's possible, it's plausible we could see something that would have key elements of one or another of these scenarios but the point is to challenge our thinking in a lot of fundamental ways, not to predict the future but to think about what are the forces that will likely shape the future.

And, one thing that will help NOAA do -- and I'm saying this as NOAA's planning director -- that I think we could do a much better job at, we don't systematically analyze and have a methodology for discerning what trends we should monitor and track over time. It's big world with a whole lot of different factors. These scenarios will help us sort of tease out major trends, major dynamics, some of which we want to try to affect, change how they might evolve, reduce the degree of uncertainty associated with certain environment predictive phenomenon for one instance.

There might be other issues that we have absolutely no control over but could have profound impact on how we do business. And generally organizations that can do that are organizations that are better positioned to survive and to rapidly respond to major exogenous changes.

And I think that you can see that in the way that a lot of different organizations have successfully or not successfully responded to fundamentally different economic conditions that exist now. But to me I think it brings back to us a discipline of deciding and actually monitoring major forces and trends and also trying to think about an organization in a public setting that's strategically flexible and adaptive. And I think that that's a key kind of message that comes back to us from an organizational point of view, when you look at the range of potential outcomes in some of these scenarios. But point well taken, and I really want to emphasize, we're not trying to predict the future here.

ADMIRAL WEST: I agree with what you just

said. Do you think NOAA is organized today to do what you just said?

MR. PAUL: For The strategic flexibility point? I don't really know and I think that --

ADMIRAL WEST: Well, I will suggest to you that NOAA needs to reorganize.

MR. PAUL: That might well be the case.

ADMIRAL WEST: No, I really firmly believe this. If you're going to pertinent and relevant, first of all, are you going to pursue an Organic Act for NOAA? I mean, what is the strategy with you and Commerce, is the role of NOAA? Are you going to get involved in climate change? If you are, then you're not structured correctly now.

MR. PAUL: Correct.

ADMIRAL WEST: And if you don't start making these moves now, then it's business as usual for the next term.

MR. PAUL: Yeah.

ADMIRAL WEST: And that's really all you can look, I think, is, you know, in the next four to

five years or so. But, so that's why I asked. What is coming down from above, too, from the folks that will support whatever you want to do?

MR. PAUL: Yeah, we're trying to put that together. And, I think that there were two key things that you said and they both were preceded by an "if". The organizational piece to me follows from the answers to the "ifs." It's an implementation of a strategy and we're really trying to get that strategic focus to allow us to then say how well are we organized to implement.

ADMIRAL WEST: Do you, maybe you know, has NOAA been directed to be, to establish a climate service by either the Administration or Congress? I saw some language and I can't remember where I saw that that was in fact the case.

DR. DOREMUS: On the administration side, on behalf of the administration, Dr. Lubchenco has committed to establishing a National Climate Service, and starting at least with NOAA recognizing that it's a multiorganizational requirement for the federal

government as a whole. On the Hill there's been a lot of provisions and statutory proposals but nothing yet passed that formerly establishes a National Climate Service in that kind of manner. It's in process right now.

ADMIRAL WEST: So you think it's inevitable?

DR. DOREMUS: I think it's highly likely.

ADMIRAL WEST: Okay. Then that ought to be driving what you're looking at in what you're looking your strategic --

DR. DOREMUS: It's driving a key piece of it --

ADMIRAL WEST: -- which means reorganization --

DR. DOREMUS: A very, very substantial piece of it. Yes.

MR. SKINNER: Other comments or questions? Paul, thanks very much. We appreciate your taking the time. We know your schedule is very busy.

DR. DOREMUS: It's a great pleasure and I

certainly want to extend an open invitation for any of you to connect with me directly, follow-on, on the aspects of this, as your thinking evolves. And please don't hesitate to do that. I'm easily reachable at night.

MR. SKINNER: Oh, you don't know what you've just said.

DR. DOREMUS: I meant it.

MR. SKINNER: Thanks very much.

DR. DOREMUS: Thank you.

MR. SKINNER: We appreciate it.

(Applause)

MR. SKINNER: Juliana, I think you're up next if you're ready to go.

MS. BLACKWELL: I'll walk slowly.

MR. SKINNER: Yes, walk very slowly.

MS. BLACKWELL: Well, I have only, I have about twenty minutes' worth of things to go through so it shouldn't, maybe even shorter if I can flip through some slides quickly. I'm Juliana Blackwell. I have been the Director of the National Geodetic Survey since

January. I have been with NGS for, officially since 1996 so I have been here in a capacity but it's been a different perspective for me stepping into the director role. So, I'm pleased to be here and I just want to give you a few updates on things that we have done and are working on in NGS currently.

Okay. I just want to give you a brief update on the NGS strategic plan. This has probably been mentioned, since it's been in draft since last year, it has probably been mentioned at the previous HSRP meetings but I just want to give you a little status update.

What we've done here within the National Geodetic Survey is look at a three to five year outlook, not quite the 25 years but we do have a ten year plan, which is what's driving our strategic plan, and which is something that we'll be looking at on a yearly basis to make sure that we are focused on the things that we say that we're going to, our goals that we have put forth in the ten year plan. Again that's also something that we did over the last 18 months as

an organization, getting feedback from our stakeholders and our users and our internal offices that we work with, trying to outline what our big goals for the next ten years, and I'm going to go through briefly but I just want to give you an update.

The strategic plan is a two-page document. If you haven't seen it, it's available on our Website and the link is posted here. You're more than welcome to take a look at that and provide comments if you like. The comments, we're trying to get this wrapped up by the end of the month so if there's something majorly wrong that you like to comment on that be great; otherwise, we have a 60-page document which you probably do not want to look through but that's more detailed about our ten year plan.

We've discussed this internally recently and we're trying to not only use this to guide our organizations but make sure that all of our employees are engaged in supporting some of these major efforts that we have underway and identifying that within their performance plans, so, trying to get more of the

workforce engaged in moving forward and moving into the new ways of doing business to make sure that we can accomplish the goals that we have set forth.

Okay. We're just going to go through these next four slides, just click through the next three or four. What I wanted to show here, and it will culminate in the next one, is that in the National Geodetic Survey's ten year strategic plan, all the different Five Most Wanted things from the HSRP recommendations and the reports, that was published in 2007, are intertwined in the major things that we have set forth, modernizing the geometric or the horizontal datum. And when you see that think back to the real estate laws of location, location, location. Building on what Dave Nemerson said earlier this morning, the geopotential or the vertical datum, that's the elevation, elevation, elevation. So we're really looking at the two ways of, the two positional things that we do in support of the National Spatial Reference System, modernizing those reference frames, being able to make them more accessible and more available to

support the navigation and the hydrographic survey as well as all the other components of spatial positioning and monitoring and observations that we have multitudes of stakeholders and customers that need to have that information.

The third one, being migrating the coasting mapping program into more of an integrated ocean and coasting mapping program, the, you know, "map once used many times" motto, and the fact that we're working with other federal agencies as well as internally to make sure that we get the most efficient use out of our technologies and our resources so that we can provide the data to others for them to be able to build on in the future.

Evolving core capabilities and increasing our agency visibility, I would say internally as well as externally as far as the visibility, and all of these different things that we've set forth in our ten year plan all link back into the main, the Most Wanted things that we talked about already today in the HSRP report.

Next, so just some specific details on the major, some of the major programs and initiatives that we have going on in NGS. In conjunction with many of our partners, some of whom are here today with the Spatial Reference Centers, and other universities and state agencies, NGS's Height Modernization Program, although not, when we talked about the budget earlier, that there's not the same level of funding that's happened in the past. We do have a growth in the number of partnerships that we have ongoing. We have 17 different states as well as other interested states that are involved in height modernization in being able to move into more of a global navigation system arena in order to provide positioning and spatial information.

Recent accomplishments, we last year in September, end of August, we had a National Height Modernization Forum that was held in Florida. We have also done a lot with our training program. We have outside of Fredericksburg, Virginia in a place called Corbin, we have a small training center where we are

bringing not only internal users and partners in NOS but a lot of outside users in to train them on our services and products and opportunities for them to look at the things that we do and give us feedback on our software, our guidelines, our processes for doing not only observations but processing of our data and linking that more into not only the Geodetic but also into more of a, tidal datum reference frames, and bringing those things together more so this, today than we've done in the past, and working with CO-OPS and Coast Survey to accomplish a lot of things including some of the field procedures, workshops that we have been involved with and also workshops on leveling, and some of the more geodetic or land-based surveying applications that we do.

Next, so one of the biggest initiatives that we have going on now is called GRAV-D, and this is really the next generation of positioning for elevation information. This is basically a model that's being done with an airborne gravity collection and ground-trooping it to ground terrestrial gravity

observations.

This is basically, this project plan is also available on the Website. It's a, I think, quoted as a 38.5 million dollar project over a ten year time period, basically being able to provide a model that's going to be accurate to one to two centimeters so that you could use a system such as a GPS in conjunction with other global satellite navigation systems to provide an elevation that would be good to one to two centimeters if you do the right types of procedures, basically eliminating or reducing the need to do a lot of the traditional ways of doing leveling, line-of-site leveling that was done to create the current vertical datum, the NAVD-88, which folks from the Corps of Engineers and anybody that does work regarding the elevations is aware.

The earth is changing. We've talked about isostatic rebound. We talked about some science. We've talked about erosion and the fact that, you know, we're pretty job secure right now because we know there's enough movement around that we're going to have

to go back out there and revisit a lot of these different places. But we want to be more efficient and we want to be smarter in being able to produce products that will enable people to get elevations and position information quickly and more accurately than ever before. And so GRAV-D is one of the big initiatives that we have going and it's really the technical realization of height modernization in a sense and we're doing this at a national level.

Next, this little bit more information is basically a meter that's on a -- this is an NOAA citation aircraft but it's something that we can use to partner with other groups such as NGA, U.S. Geological Survey and some other groups like the Naval Research Lab providing our equipment, our personnel, their flight hours, however we can partner with them and be able to do this most efficiently. We have done some gravity collection last year, along the Gulf Coast, Puerto Rico and the Virgin Islands, this calendar year, and we're looking at finishing up in the Gulf Coast from the coastline of Alabama down south to the

southern port of Texas this year, as long as we can get our aircraft back up in the air and finish that up.

There's also plans to go and do some work up in Alaska, hopefully if all that works out with our logistics and partnering with NGA and the Naval Research Lab to get a portion of Alaska covered in the summer if everything works out.

Next, again just a demonstration of the different agencies that we're working with and trying to come up with ways that we can work smartly together, FAA, FEMA, Corps of Engineers. You see NASA. We really are trying to do the most that we can with our partnering agencies so that we can all benefit from this GRAV-D initiative.

Next, same, same picture, different subject matter but this is the Integrated Ocean and Coastal Mapping and again different sensors, same platform but being able to work with federal agencies at a different level to do the shoreline, to do other work from a remote sensing aspect that helps with the coastal mapping activities as well as all the integrated

products and services that not only NOS and NOAA utilize but our partners here today and the partners that we heard from this morning.

Next, so some of the applications that are driving the IOCM initiative, looking at ways to map and monitor things like erosion, the impacts of storms, the shoreline change analysis, which is critical. All the things that you see listed here, sea level rise, sea level change, whatever you want to call it, having a remote sense, remotely sensed information that we can tie together and being able to use that with control points on land so that we can make sure that what we're measuring is truly the changes in the land versus the changes in the water.

So doing the land-water interface is a critical part of what NGS does in partnering with our other Nav Services Office here to make sure that when we start looking at the numbers and the observations over the years that we are truly able to tease out whether or not the land is rising or the water is decreasing and determine what the truth is in those

different observations that we're collecting.

Next -- okay. So most recently these are some of the groups that we worked with in the collection of the ocean and coasting mapping. We'll see a few more examples of some of the projects that we accomplished this past year.

Next, so, in FY08 we did a major, four different projects here, California SeaFloor Mapping; North Carolina, there was a, as you can see in one of the pictures here, the Kurtabank (phonetic) site as well as Kachemak Bay, Alaska and New Hampshire. So we've got some different types of sites that we have been able to fly and work with our other partnering agencies. NGS was more involved in numbers two, three and four, not so much the seafloor mapping but a lot of the pilot areas have really shown that being able to use the different platforms, being able to use the different sensors and combine the data together is something that we're going to, that we've done some this past year; we're going to continue on in the next year. If you'd go to the next slide.

Some of the planned project areas, again, additional work in Kachemak Bay, Mobile Bay and back into the Great Bay area in New Hampshire. And I don't have a lot of the details on those. I was thinking that the chief of our remote sensing division, Mike Aslaksen, who many of you may know, is more involved in details of those projects. So if you have questions on those, you can see me afterwards and I can try to get more information for you on these projects.

Next, again, just, you don't need to worry about the small print here, just basically a collection of information about how many priority PORTS, the shoreline that we've accomplished in FY08, there's 33 for that total, and analyze priority PORTS for change in 24 PORTS in '08 and our projected production for '09 is, that's projected, that's maybe the current FY09 production listed here. Basically, the bottom line here with the number of shoreline miles that are planned, about 5,000, a little over 5,000 statute miles per year. That's about 3 percent of what we can accomplish on a yearly basis.

Next, many of you heard before our State Advisor Program. There's always some flux in the numbers of advisors that we have in the different states that are interested in partnering with us. It's a cost-sharing program but these are NGS employees that are in the states, and they basically act as our liaisons not only with our customers and stakeholders but also with other NOAA and federal and academic organizations in those states.

There's been some change in personnel, kind of detailed here, but basically we are, our program has been growing. We would like to be able to continue to support this. There is a study underway to see how efficient, how most efficiently we can manage our State Advisor Program and that's something we are working on currently and we'll have more of an update on perhaps at the next HSRP meeting.

Next, so, just a few pictures about some of the other accomplishments. A lot of the press that we get is related unfortunately to events such as the hurricanes that go through, and the fact that we have

pre-and-post imagery that we are able to share as soon as a hurricane has passed such as in with Gustav and Ike, able to go up and collect photographs of the areas and post those on our Website so that people can look at them shortly after the event and do some initial assessments of roads and houses and other issues. And as you can see, probably not too if you're in the back of the room but very striking pictures in the fact that we've had, you know, over 5,000 images that were collected last year in Texas and Louisiana after Ike, and the fact that there are over 32 million downloads or views of this imagery last year.

Next, one of the other items that we're looking forward to rolling out is our socioeconomic scoping study that we have completed this year on our CORS, our Continuously Operating Reference Station Network and our GRAV-D initiative. This is something that is, it's just a scoping study right now. We're looking to whether or not we're going to continue and do a more detailed study but basically the initial reports say the NSRS, and the fact with our CORS the

way it is, cost benefit of over $750 million per year by having our CORS Network and the uses of that positioning service such as OPUS.

GRAV-D once it's completed is estimated to benefit at a magnitude of $4.8 billion over the next, over fifteen years, and basically providing different, providing these products and services will enable anybody out there doing positioning information to be able to do them faster and better than ever before. This is available but it hasn't been publicly released yet. We're looking at a May or early June release date for this information but we could probably get that to you if you are looking for something before then.

Next, just some of the other highlights. We celebrated the 15th Anniversary of our CORS Program. It's hard to believe that 15 years ago, before that we did not have CORS. It's hard to imagine what life was like when we didn't have that opportunity to do our survey work. CORS program is growing. The data that we have in, that we collected, there's over 1400 stations currently coming into NGS, that we collect the

data and provide free of charge back out to users to download. We also have our Online Positioning User Service that has been referenced before, where we can take your data, submit it and it will feed you back via e-mail a position and elevation information on your GPS data that you submit.

We're also expanding our real-time positioning role and you heard about that a little bit this morning as well. Everybody wants to do things faster and it's just going to continue. So the real-time networks that are being set up across the country are not necessarily what NGS's role is. Our role is to make sure that those are tide into the National Spatial Reference System and help with guidelines and specifications on ways to make sure that those independent networks, whether they're run by states or manufacturers or local communities basically are giving the right service to individuals by making sure that they are tide to the national reference frame.

We've participated in some real-time

network presentations, at things such as the American Congress on Surveying and Mapping Conference this past year and the Trimble Dimensions Conference, and draft guidelines for RTNs are going made available for others to review here shortly if they're not already posted on our Website.

Next, big highlight, we celebrated, we have, a hundred million digital products have been served. Somehow or another our IT folks have been able to collect all the information of what's been delivered and so a major milestone accomplished this past March is that since we've started taking these kinds of statistics since 2003, we've provided over a hundred million digital geospatial products, which I think is pretty amazing.

What does that mean? That means things like the CORS GPS datasheets, our data, our paper data sheet product which you can download electronically, GIS shape files, and a lot of our online positioning user service solutions, which have now numbered over a million serves, and also our shoreline data downloads,

in addition to that, the 32 million user downloads of the hurricane images, which are not included in this total.

But basically our Website is getting a lot of action. We are looking at hopefully in the near future being able to upgrade that to make it more user friendly. It's something that we need to move into the future with the way our Website is configured. And we know that that's an issue so we're working on that. I think that's it. Next? Yeah. So anyhow, that's all I have. If you have questions for me I'd be glad to take them. I don't know how we're doing specifically on time but --

MR. SKINNER: Great.

MS. BLACKWELL: Tom?

MR. SKINNER: We're fine. We're fine with time for right now. And, thanks very much for the overview. I think that we had an early version of the strategic plan that Gary, I think you had a work group or a subgroup that reviewed it.

DR. JEFFRESS: Right.

MR. SKINNER: I'm not sure that there were enough -- should, you want us to take another look at it for more feedback or -- this is before, obviously before you were the Director.

MS. BLACKWELL: Right. Right. We looked at it again recently and so it hasn't been updated on our Website yet but maybe what I will do is once we -- there are just a few minor tweaks. Once that's done, maybe I'll just send it to you or Gary or the group and just say here's what we have and if you want a quick look, fine.

MR. SKINNER: Okay.

MS. BLACKWELL: But again this will be something that we'll be looking at on a yearly basis as well, so, and, I think we're okay for now but if you want to take another look at it, you're more than welcome to.

MR. SKINNER: Great. I just wanted to make sure that you knew that if you didn't hear from us, it wasn't through lack of interest.

MS. BLACKWELL: No.

MR. SKINNER: Okay.

MS. BLACKWELL: I know there's been one set of comments that have come from this group already.

MR. SKINNER: Okay. Any questions, comments from the panel? Jon?

MR. DASSLER: Yes. Juliana, I just wanted to get clarification I guess on GRAV-D or just my characterization of that if that's correct. But the way I understand it, GRAV-D now once you have that model, that basically the Geoid model be strictly a gravity-based model so there won't be warping to benchmarks and fitting benchmarks and ultimately what that would do is replace the use of benchmarks so basically CORS sites will be benchmarks that are continuously being monitored.

MS. BLACKWELL: It will shift more to a GPS-based elevation model -- I shouldn't say elevation -- GPS-based for monitoring but the actual vertical datum will be derived from the gravity. So, like right now our Geoid model is based on a satellite like the Grace and -- the Grace Mission, et cetera, and

then we pin it down with our benchmark information, which we know in some cases is not as accurate as it could be. The GRAV-D will be ground-trooped by gravity but most of the data collection will be an airborne collect and that will be fitted into the other satellite-based gravity data that we currently use in our Geoid model.

So there is a satellite component that's the foundational stuff but the low wavelength information will be based on the airborne gravity collection. And that, what we anticipate with that model, that will enable us to use that for our vertical datum of 2018; that's our target date, is being able to replace NAVD-88 with a gravity based vertical datum. So, does that answer your question?

Benchmarks in the sense while there may be people who use them, they shouldn't rely on elevation information from the in NAVD-88 datum. That will not be supported after this new vertical datum is released. And again that's a ten-year timeframe for that. There always will probably be a need for people to have

benchmarks for certain, you know, reasons, certainly in areas that are changing, in order to get a true relative elevation comparison but we expect that it will be more of an airborne thing. But we will be able to monitor using GPS and we will be able to update especially in the areas that are showing change over a ten or twenty year time period, we'll be able to improve that Geoid model much easier with the GRAV-D version than by re-leveling, you know, thousands of kilometers of roads, et cetera.

MR. DASSLER: Then another question is that I know there are a lot of regional networks that are popping up that aren't being run by NGS but they mentioned some of the private cooperatives and that kind of thing. And, is there any kind of plan on how to get those into the fold where it can be more of a nationally, national structure to those types?

MS. BLACKWELL: The current plan is not necessarily to have them be part of the net -- well, not to be our responsibility to have them as part of our CORS necessarily but to ensure that they are tying

into the National Spatial Reference System, that there is a set of guidelines to show them how to check their positions and make sure that their infrastructure within those state or regional networks truly are accurate in reference to the National Spatial Reference System.

And I know right now that, you know, there are a set of draft guidelines that are being worked on by NGS, and if you haven't seen those or heard about those I can put you in touch with Bill Henning, who is our real-time expert there in Silver Spring. And, he's going to be looking for people to review the documentation but basically being able to help people with making sure that the networks that they're setting up truly are linked back in to the NSRS but not necessarily -- in other words, if everybody goes and sets up 50 CORS sites in their state or their area, we don't necessarily, NGS doesn't necessarily need to have all those stations feeding into a national CORS program.

We would recommend probably that they have

some way of linking to our CORS to make sure that they are truly fitting and can be monitored to make sure that they aren't changing so that their services in the real-time network are being done appropriately for their users.

MR. DASSLER: Right. Yeah, I think it seems like there's a lot of these being set up and there's no real guidelines or standards in it, kind of haphazard.

MS. BLACKWELL: We're working on those and, like I said, there is a draft and if it's not been made available to you yet we'll be able to provide that shortly. And we don't expect that Matt will have all of his 45 CORS stations in out National CORS Network.

DR. JEFFRESS: Julianna, I don't know if the guys on this panel realize it but the Europeans put up a gravity satellite most recently; GOCE, is that the name of it?

MS. BLACKWELL: GOCE, yeah.

DR. JEFFRESS: GOCE, GOCE. Have you seen any of that data yet? And I guess NGS is going to have

access to that data, correct?

MS. BLACKWELL: I know that our chief geodicist was very excited about that when it was launched. And I would anticipate that one way or the other that we will have information from those, from that collection, yes. I don't know a whole lot of details about it but I know that it made a big difference to Drew and to the Geoid team. So, we're looking forward to that. Again that's not going to do away with the need for the GRAV-D because it's not going to be at the level of resolution that we need, but, to get the one to two centimeter accuracies but it certainly will be a much more accurate foundation to provide for our Geoid models with this new launch of GOCE. Is that right, GOCE, G-O-C-E?

DR. JEFFRESS: Yeah, but I think the Europeans pronounce it "go-SAY."

MS. BLACKWELL: Okay. Well, I'm an American. Any other questions? Thank you.

MR. SKINNER: Great. Thanks very much, Juliana.

(Applause)

MR. SKINNER: Once again I'll break from the agenda just a little bit to see if there is anyone from the public who would like to make a public comment, statement.

(No affirmative response)

MR. SKINNER: Okay. The last part is really to look at proposed recommendations from Day 1, meeting wrap up, next steps and expectations for DAY 2, which seems like a lot but probably should not take too long. I think for the framework for our recommendations this year I wanted to, or for this meeting, I wanted to focus on how the stakeholder panels consistently seemed to support and reflect the Most Wanted report. We get more information and more details, which I think are important and help improve the recommendations. But I'm sort of envisioning a letter that reflects that fact that really focuses on the importance of the stakeholder panels with the individual recommendations that we choose to make.

Ashley had to leave but before she left she

handed me these write-ups which are sort of notes from today's meeting, which I think will be very helpful in terms of thinking about what types of recommendations we would like to make in the letter. And I would also like to float the idea of going back to a process we used I think once, which was to develop the letter and then have a telephone, an advertised conference call meeting to approve the letter.

It just seemed that we were much more reflective and had time to think about things more than trying to get an approval at this meeting without seeing the actual details. So I wanted to see if the panel had any thoughts on this and whether that provided -- I know we'd have to advertise in the Register -- or not advertise, we'd have to notice the meeting in the Federal Register if we get a conference call. Is that particularly onerous or is that a possibility to do that, if that's how we chose to go? Do people have strong views on that one way or the other? Can I get a candy bar for anyone? Ed.

MR. WELCH: Tom, one thing, first a

conference call is fine with me but I think perhaps we ought to have an objective of getting the letter finalized and transmitted to whoever we're going to transmit it to more promptly than we have. You know, this last one, the advantage was it went to the new administrator. The disadvantage was it was basically four to five months after the fact. We could probably wrap it up quicker. I know the staff has to leave these meetings and go on to other things but it would be I think useful if the letter could be finalized and delivered in a more timely fashion.

MR. SKINNER: I think part of that has been, I have been interested in waiting for the meeting minutes to come out to make sure that what we recommend is actually what we talked about. I think having notes like this is very useful and I'm more than willing to draft the first round to get it started because I know that everyone will be busy after this meeting and within about a week after we leave here planning for the next one. So, I'm happy to take on that task and circulate a draft earlier as we are waiting for the

meeting notice requirements, if that's acceptable to the panel. Andy?

MR. ARMSTRONG: I would like to make a sort of extraneous remark at this point. But, since we're talking about the letter that we send on, it occurs to me that, you know, one of our opportunities for providing input to the strategic planning exercise was a copy of this letter, I think we talked about. It seems to me that this strategic planning exercise has the potential to really drive the apportionment of NOAA's budget over the next four years or so in a way that we can't afford to let slip by.

So, my sense is that is that we should do more than send a copy of our letter to the strategic planning group as our input. I think we should sort of address those slides, those strategic planning input question slides directly. And like I said, it's kind of extraneous but I think we don't want to just go off and leave that at this point; otherwise, we'll be wondering why, you know, the Climate Service is getting all the funds and no one is paying attention to

Navigation Services.

MR. SKINNER: I think that's an excellent point. I hope that Paul's PowerPoint is, will be available to us, is that --

MS. DENTLER: Yes.

MR. SKINNER: Okay, because there was a lot of information there and being able to go back and look to see how we can plug in to that process I think will be important so I think that's a great, great point. Great. Thank you. Any other comments on the process of this? I think what I recommend is that if you -- here, I'll pass these around, different directions -- you can please feel free to make your own notes. There are some additional comments that were made about potential recommendations. I know Admiral West had one on funding for PORTS that might be a possibility. We talked a little bit about collecting data in the Arctic. There were some others. I don't have them right in front of me but feel tree to jot those down.

We have some time tomorrow afternoon where we can talk about this further along with the strategic

plan that we worked on in Tampa. On the strategic plan, again, I'm not, I don't think we have to rush through this in terms of coming up with something definitive by the end of this meeting. I think for a lot of us this will be a reintroduction to what we all said and agreed to at Tampa by going through the strategic plan summary. That's also in the packet. It's sort of in small print.

So, if you could take a look at that. I know we have some edits to that. Captain McGovern provided some. Some of you may have some others. So first of all I think we need to go through it and make sure that we're all in agreement with what's been written down. So if you have a chance sometime in your free time between now and tomorrow, take a look at that, that would be great. With that, any other general comments on how we put together recommendations and sort of make the views of the panel known to the powers at be?

MR. WELCH: Tom?

MR. SKINNER: Ed?

MR. WELCH: These aren't necessarily recommendations for a specific action but I think we ought to highlight the fact that the Maryland Port Administration is highly dependent on the hydrographic charts in fulfilling their dredging mission, which is essential for their port operations. That seemed to be very much key to them and we ought to emphasize that to the Administrator.

And secondly, to the extent that both the pilots and the Port Administration itself indicated how useful the port system was in the Chesapeake to making Baltimore a continual, continued viable port and in fact it provided them with a marketing tool, that they had that system in place.

MR. SKINNER: I couldn't agree with you more. I think that we're sort of evolving in the letters representing what we've heard of the stakeholder panels and I think the more that we can speak with their voice as well as our own, the better off or the more effective our letters are. Particularly prior to the meeting Steve and I were

talking with Paul and he said how useful panels like this are to channel public opinion. I think that's essentially what he said. So I think that that's a great opportunity to do just that, and those are two great, two very good examples. Other comments? No one's mentioned it to me but I think we have forms that we're supposed to sign for --

MS. WATSON: T&A and travel.

MR. SKINNER: See how well-trained I've become?

MS. WATSON: Please.

MS. STUBY: Can I can request that everyone please get them in, try to send your receipts in five days? A month is not good.

MS. DENTLER: We get yelled at.

MR. SKINNER: Yeah, also on -- I passed around all of them so -- the notes that were prepared for, as a result of today's meeting at the top, there is a handout in your packet on the presentation that Jack's going to be giving tomorrow. If you could also look at that, that would be great. So, if there are no

additional comments, we will break -- I'm sorry? Oh, public comments. Any final public comments? Has anything I have said in the last ten minutes --

MS. WATSON: No.

MR. SKINNER: That's the briefing for Jack, right. Right?

MS. STUBY: Yes.

MR. SKINNER: Okay. And that's in the packet?

MS. DANIELLE: Yes.

MR. SKINNER: Great. Thank you. We'll see all of you down in the lobby. Okay. One more announcement. Steve?

CAPTAIN BARNUM: I just want to talk about tomorrow's scenario, certainly a significant portion. We're going to break for the dedication of the Bay Hydro 2 tomorrow and we will certainly have Mary Glackin here tomorrow morning to speak to us and then we will break, I believe, at 10:30 after public comment and then proceed across the street here to the Inner Harbor, but just to go over, it's going to be a

relatively simple ceremony. It's not a commissioning, but, so, keeping in scale with the size the vessel, it's not an aircraft carrier, 55 feet long.

But we do have our honorary speakers. We have certainly Mary Glackin will be here to speak today. She's number two in the organization. She will also be our keynote speaker, honorary speaker. We also have Captain Mike Watson. He's president of the American Pilots Association, will be here tomorrow. Jeremy -- from the office of Senator Barbara Mikulski, who will read a statement from her office and we have a couple of still-to-be DVDs, but we'll see, from Senator Ben Cardin and Congressman Elijah Cumming's office. And then lastly Jack Dunnigan will say a few words and then present a plaque.

And then followed by that will be the breaking of the bottle by Mary Glackin on the bow of the Bay Hydro. And then we will close and then have the compliments of the Maryland Pilots\providing refreshments, light refreshments for the events and opportunity to interact with our guests, to include

some of the congressional staff which plan to attend, so, and other port executives.

MR. WELCH: If I could, Mary Glackin, who will be speaking with us tomorrow, Tom and I met with about a year ago and she will be, at least since my tenure on the panel the most senior NOAA official that we have had. So this is a good opportunity for people to make comments. She's not going to know all of us either or what our affiliations are so we should tell her.

We should take, you know, we should take every second we have that's available to us to interact with her because she's pretty knowledgeable about some of our things. When Tom and I went in to see her last spring, either she knew quite a bit about our Most Wanted or somebody briefed her very well. She brought things up before we had a chance to do so but this, you don't get to see, you know, senior people at her level every day so we ought to take advantage of it.

MR. SKINNER: Yeah, I think I sent around an e-mail afterward. It was pretty impressive. She

was clearly well briefed but briefing a person is one thing; retaining the information and actually being able to ask you pretty high-level questions about it is another and we were pretty impressed with her. So, I second what Ed just said.

MS. WATSON: Tom, Steve, Helen Brohl with MTS will be at the ceremony tomorrow. She'll be sitting with the panel and then coming to the meeting afterwards, so, FYI.

MR. SKINNER: Okay. Anything else? Sorry. Bob, will we see you tomorrow?

STENOGRAPHER: Yes, I'll be here tomorrow.

MR. SKINNER: Excellent. Thank you. We'll adjourn until tomorrow morning at 8:30. We do have with the logistics of moving across the street and I think we'll probably start right at 8:30 if can.

(Meeting adjourned for the day at 4:31 p.m.)

State of Maryland.

Baltimore County, to wit:

I, ROBERT A. SHOCKET, a Notary Public of the State of Maryland, County of Baltimore, do hereby certify that the within-named witness personally appeared before me at the time and place herein set out.

I further certify that the proceedings were recorded stenographically by me and this transcript is a true record of the proceedings.

I further certify that I am not of counsel to any of the parties, nor in any way interested in the outcome of this action.

As witness my hand and notarial seal this 29th day of April, 2009.

_____

Robert A. Shocket

Notary Public

My Commission Expires:

November 1, 2010