U.S. DEPARTMENT OF COMMERCE

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NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

HYDROGRAPHIC SERVICES REVIEW PANEL

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PUBLIC MEETING

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WEDNESDAY
AUGUST 31, 2016

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The Hydrographic Services Review Panel met in the City Club of Cleveland, Conference Room 200, 850 Euclid Avenue, Cleveland, Ohio, at 8:00 a.m., Bill Hanson, Chair, presiding.

MEMBERS PRESENT

BILL HANSON, HSRP Chair
JOYCE E. MILLER, HSRP Vice Chair
DR. LAWSON W. BRIGHAM
LINDSAY GEE*
KIM HALL
EDWARD J. KELLY
CAROL LOCKHART
DR. DAVID MAUNE
CAPTAIN ANNE MCINTYRE
SCOTT R. PERKINS
EDWARD J. SAADE
SUSAN SHINGLEDECKER
GARY THOMPSON

***participating telephonically**

NON-VOTING MEMBERS

ANDY ARMSTRONG, Co-Director, NOAA/University of New Hampshire Joint Hydrographic Center
RICH EDWING, Director, CO-OPS, NOAA
DR. LARRY MAYER, Co-Director, NOAA/University of New Hampshire Joint Hydrographic Center

STAFF PRESENT

REAR ADMIRAL SHEP SMITH, HSRP Designated Federal Official
MIKE ASLASKEN, Chief, Remote Sensing Division, NOAA/NGS
GLENN BOLEDOVICH, NOAA/NOS
ASHLEY CHAPPELL
DAVID CONNER, NOAA/NGS
JENNIFER DAY
SAM DEBOW, NOAA/OCS
DAVE HOLST, NOAA/NOS
CHRISTA JOHNSTON, NOAA/NOS
BRANDON KRUMWIEDE, NOAA/OCM
TOM LOEPER, NOAA/OCS
GARY MAGNUSON, NOAA/OCS
RACHEL MEDLEY, NOAA/OCS
LYNNE MERSFELDER-LEWIS, HSRP Coordinator
RUSS PROCTOR, Chief, Navigation Services Division, NOAA/OCS

ALSO PRESENT

JACKIE ADAMS, Environmental Scientist, Great Lakes Restoration Initiative, Great Lakes National Program Office, U.S. Environmental Protection Agency

JOHN T. ALLIS, Chief, Great Lakes Hydraulics and Hydrology Office, U.S. Army Corps of Engineers - Detroit District; U.S. Chair, Great Lakes Coordinating Committee

HELEN BROHL, Director, Committee on Marine Transportation System, U.S. Department of Transportation

SAMANTHA BRUCE, QPS

THOMAS R. CRANE, Deputy Director, Great Lakes Commission

DEBORAH H. LEE, Director, Great Lakes Environmental Research Laboratory

SCUDDER MACKEY, Ohio Department of Natural Resources

CAPTAIN SCOTT SMITH, U.S. Coast Guard

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

(8:07 a.m.)

CHAIR HANSON: Well, good morning, everyone. Welcome back for Day 2 of the Hydrographic Services Review Panel Public Meeting in Cleveland, Ohio. I was going to ask a trivia question this morning, but it looks like the -- it's already up on the list and I was going to ask who can name all five Great Lakes.

Well, four. Okay. It's a Rick Perry moment, so what was the fifth one? Which one was missing? Superior. Superior is missing. All right. We want to start off this morning reviewing, quickly, some of the highlights from yesterday's discussions and panel presentations before we get into today's business, which is going to include panel discussions this morning about some of the things we've been working on as a panel and then followed by some presentations and stakeholder engagement as well.

So, Joyce, I think you had a list, you were going to kick us off this morning, on highlights from yesterday.

VICE CHAIR MILLER: Yes. Good morning. What we try to do is to summarize issues we heard brought up that are direct impacts to NOAA that we might reflect in our -- the letter that follows every panel meeting. So from Captain Paul Arnett's presentation, I got two issues that -- and I think there is going to be cooperation, but better ability to track the U.S. Coast Guard chart recommendations, that a way to efficiently track feedback was necessary.

And the second issue, I believe, Captain Arnett raised was, the clutter on the charts from AIS, and that there's simply too many things, and that --- a way to de-clutter charts. And that was mentioned again, I believe, in Admiral Smith's presentation.

From Josh Feldman, U.S. Army Corps activities, we have run into this multiple times in multiple places. The difficulty in connecting a particular district's data, the ability to get it in one place, and the ability to get it to NOAA in an efficient manner so that it can be shared with everyone, because people tend to look at the NOAA site for information and they don't necessarily know about every different Army

Corps.

And I think we need to highlight Dave Holst's presentation that the Lake Carrier's Association stepped forward for the PORTS system. One of the issues, papers, that we're dealing with is PORTS and we believe -- and also, later on, let's see, this was not directly Great Lakes, but Cape Cod said that any system must be a PORTS installation.

And then later on that the pilots, I believe -- one of the pilot's requests was that Toledo get a PORTS system as well as several other harbors. And if anybody noted which harbors those were, I'd appreciate it, because I didn't get it all down.

And then also from the Lake Pilots Association, continue maintaining the Toledo Maumee River current meter and another important recommendation was getting water levels, wind speed, and direction on VHF or AIS; either one. And those were the highlights that I had. Anyone want to add to that or --

MEMBER BRIGHAM: Yes. This is Lawson Brigham. I think that we were going to mention the positive theme about public/private partnerships and federal/state relations, and all of that, that we saw and heard across the board in one of the panels, that we should say something in our letter about the new engagements and the importance of those partnerships in actually funding some of the PORTS hardware.

VICE CHAIR MILLER: Okay.

CHAIR HANSON: Of course, these issues are important for us. As the panel concludes our business, we will begin preparation of letter recommendation that goes to the Undersecretary, underscoring issues that we believe need to come to her attention and are very important for this advisory committee to get in front and believe need to be dealt with.

I will note, need to note, for the record, sir, I know we already talked about privately, but letter of recommendation that came out of this panel at the last meeting has not received a response and that's unfortunate, and disappointing, and all the other words that go along with that, for us, and so we appreciate your attention on that.

And as we present our next letter of recommendation, we will track that a little closer, although, we would like to see as much excitement in the response as there is in our submittal, so hopefully, next time we can be more timely and more productive in making use of the time that we spend here. Didn't want to belabor that point, but I did want to get that on the record.

And finally, Dave Holst mentioned to me this morning that apparently he and I are the only two that paid attention to the business casual mandate, no ties, so I know some of you wear ties as pajamas, so you keep them on all the time, but feel free to be a little more productive, so thank you.

MR. ASLASKEN: Mr. Chair, one thought, I was talking to Mr. Holst last night and one of the previous jobs I had was working downtown and supporting the Undersecretary, and at that point in time, when Scott Rainey was the Chair, I believe it was either quarterly or every half year, the Chair met directly with the Undersecretary.

And I would recommend that we try to reinstate that fact, that not only taking your letter to the Undersecretary directly, but also speaking to her, or the follow-on, directly, I think, is more effective, and try to reinstate that.

CHAIR HANSON: Very good. Actually, we had talked about that and perhaps one of the reasons we had high hopes this going time is because we had had, Joyce and I, had that meeting with Captain Brennan and with Admiral Brown, and found it very effective, very encouraging, and thought we were on the right trajectory, so if we can just close that loop, I think we'll keep everyone on the right trail, so appreciate that.

MR. ASLASKEN: I think that's an action for us here at NOS. We have a PCO, the person who works directly on the Undersecretary's staff, and I think that's something very easily we can do. It just takes a little bit of time.

CHAIR HANSON: Understood. Okay. Thanks for that, Mike. All right. Next, let's go ahead and get started with our committee business. We're going to talk about the good

work of the Planning and Engagement Working Group, led by Colonel Dave Maune and Joyce Miller. And this is where a lot of work on our issue papers is being done.

Something that the former Chair instituted, Scott Perkins, and I've had the privilege of just tracking with him on it, but this is an idea of instead of putting bullet points in our letters of recommendation, let's give some real meat and some backup, and I think it's been very successful, it gives us a lot to talk about, and a lot to work on in the future.

So, Joyce and Dave, I'll turn it over to you guys.

VICE CHAIR MILLER: Can we have this put up on the screen? Do they have a copy of it? It would be -- of the three papers. Okay. We were going to discuss the PORTS paper because it's the one that is --that we've been working on, clear up until this morning, and we're waiting for a new printout to make sure it printed out correctly. For some reason we have a severe technical glitch.

So we're going to discuss the first one, Hydrography, A Core NOAA Mandate, first, and are those -- do they have a copy of that?

MEMBER MAUNE: Yes. Everybody should have one in their folder in the right side in the back.

VICE CHAIR MILLER: Okay. I was hoping that maybe we could put it up on the screen. Okay. All right. So I think as a summary, I'll read the second paragraph, which -- so people in the audience understand, the last meeting in Galveston, we put forth three papers, one was on the fleet -- the needs for hydrography vessels, the second was on, what's the correct title, New Hampton, or on Hampton Roads. Hampton Roads Regional Pilot Project and then the third one was a one-page report, which was a follow-up to a quite lengthy report on the Arctic.

So this time we have three candidate papers, Hydrography, it's actually A Core NOAA Mandate, Reference Frames 2022, and the PORTS issue, that has been a recurrent issue, so let's go ahead and discuss Hydrography, A Core NOAA Mandate.

For the audience, I'll read the second

paragraph, which is kind of our bottom line up front. Although NOAA's missions have grown substantially since its formation in 1970, these original mandates are as critically important today as they have been over the past two centuries. The two original mandates were survey the coast of the United States, 1807, and provide nautical charts and products for safe maritime commerce and navigation, the Coast and Geodetic Survey Act of 1947.

NOAA's leadership should emphasize the importance of these mandates to the Department of Commerce, Office of Management and Budget, and the Congress, and request funding for NOAA's Office of Coast Survey at levels that will decrease the hydrographic survey and charting backlog, maintain NOAA's status as a world leader in hydrography, and sustain U.S. economic growth.

So that's essentially what we're asking and we have four direct recommendations for NOAA actions; stress the importance of legislative mandates for hydrographic services to the Department of Commerce, Office of Management and Budget, and Congress, and request funding to decrease the hydrographic survey backlog, return hydrographic services as one of the highest internal priorities for NOAA's National Ocean Service.

If NOS does not highlight hydrographic services as one of its critical priorities, it will never be perceived as such within or outside of NOAA. Formulate a long-term sustainable plan for recapitalization of the NOAA fleet and make replacement of hydrographic survey ships one of the highest priorities.

Support appropriations for additional hydrographic training centers, as authorized in the Integrated Ocean and Coastal Mapping Act of 2009, to provide trained hydrographers for both government and commercial positions.

So does any -- we have discussed this multiple times in telephone conversations and were fairly satisfied that all recommendations that could be possibly fit into two pages were included, which is always a challenge. So are there any further questions or comments?

MR. ARMSTRONG: Thanks, Joyce. At the risk of sounding self-serving, on the last

recommendation, support appropriations for additional hydrographic training centers, so the IOCMA actually provides authorization for additional integrated ocean and coastal mapping centers, including one hydrographic.

VICE CHAIR MILLER: Okay. So Ocean and Coastal Mapping.

MR. ARMSTRONG: Yes, and that would be -- those would have education, not as a primary mission, but as a --

VICE CHAIR MILLER: So instead of hydrographic --

MR. ARMSTRONG: Yes, I would just say Ocean and Coastal Mapping Center.

VICE CHAIR MILLER: Okay. Thank you. That's an easy change to make. I did have some discussion last night whether -- because hydrography, the title -- oh. I did have some discussion with others last night because hydrography is a confusing term to some. Some people take it mean CTDs, and whether the title might be misleading and perhaps we should say ocean and coastal mapping or navigation services, perhaps, but we're talking, really, about the mapping functions here. Any discussion?

MEMBER BRIGHAM: I mean, the word hydrography is in the title of our group, so I would stick with hydrography.

VICE CHAIR MILLER: That's kind of my --

MEMBER BRIGHAM: In the professional world and the people -- the network that we -- I think even the staffers on the Hill will know what hydrography is, unless you want to put hydrography and charting, but, I mean --

VICE CHAIR MILLER: Yes.

MEMBER MAUNE: This one seems to be non-controversial, we've coordinated this a lot and received a lot of feedback from people, so I think this one's ready to go.

VICE CHAIR MILLER: Okay.

MEMBER MAUNE: Any objections?

MR. BOLEDOVICH: Maybe a couple technical corrections. The statute, it's the Ocean and Coastal Mapping Integration Act, those types of things.

VICE CHAIR MILLER: Yes, I was just ad hoc'ing it. I've got it quoted in here.

MEMBER MAUNE: Okay. Are we ready to move on to the second paper then? Okay. Please go to the paper entitled, Replacement of the North American Datum of 1983 and the North American Vertical Datum of 1988. The reason this one is significant is that, in 2022, basically, every map and chart that we use in the country is going to be obsolete because the basis of the measurement, the datum, is going to change.

We are going to have new horizontal and vertical datums and every horizontal position is going to change by X amount in easting and Y amount in northing, and every elevation is going to change by some amount vertically, and even though this paper pretty much reports what NGS is probably going to do anyway, we thought it was important to bring the issue upfront so that the NOAA administrator, and anybody that we can get to read this paper, will recognize that there are major changes ahead and the significance of what NGS is doing with these new datums.

Gary Thompson wrote this paper and, Gary, I wonder if you wanted to make any comments on it?

MEMBER THOMPSON: No, I think you covered it well. Just one question for Mike, there's one sentence in here I may ask to remove. Mike, look on the one, two, third paragraph down, one, two, three, fifth line, we have a short sentence that says, furthermore, all state plane coordinate systems will change.

More than likely they will, but there's a possibility some states may keep their same state plane coordinate system constants. So do you think that sentence should be removed or?

MR. ASLASKEN: No. I think one of the big issues that we see, and face and discuss it, at least at headquarters in NGS, have been the state laws are going to be changed and how this will impact state plane coordinates. So I think, you know, highlighting the fact that will or will not change should be in there, and maybe stressing even more the fact that at the state legislative level, you know, that we really need to make a push across the nation.

MEMBER THOMPSON: Right. Yes, because I think there's 40, 43 states that have legislation that's going to have to be modified.

MR. ASLASKEN: Okay.
MEMBER THOMPSON: I'm okay with leaving it in there.
MEMBER MAUNE: Thank you. Essentially, the only issue has been, is the paper too technical? Starting at the bottom of the first page, we get into subjectology here that gets into spherical harmonics and different things on procedures they use to adjust the gravity model. It's rather technical language, but it does show that there's a lot of technical calculations that go into coming up with a mathematical model that basically describes the bumps in the gravity changes in the Earth.
And how you define this mathematically is done with a tool called spherical harmonics. When I studied this at Ohio State University it was the most complicated subject I took. We talk about it here a little bit, it just gives you a flavor that there's a lot of technology in there, but it's a part of the process.
And so I thought to leave it in, but there may be people who think it will cause people's eyes to glaze over, and if anybody has any objections, please let me know now or forever hold your peace.
DR. MAYER: Just a question, as I read through this, it is technical, and depending on what its purpose is, it's fine, and I agree that it's important to let, even, people who don't understand the technical aspects understand that this is a complicated thing.
But I wonder if somewhere, I mean, something that really hits home, a statement that says -- you know, just the GPS each one of us uses every day is dependent on this sort of backbone, something that would standup to anybody on the street, more than just saying transportation, but it's something where that, you know, they really can associate with it. Just a one-liner in there might really help right upfront.
MEMBER MAUNE: Gary, what do you think?
MEMBER THOMPSON: Well, in the second paragraph, we say how much change, there is going to be a change both horizontally and vertically, and give some mathematical values. You know, we

can always add --

DR. MAYER: You know, I think, already, that's getting so technical that a staffer will get glazey-eyed the minute they start seeing GNSS and the time-tracked geoid gravity models, so I'm just saying right upfront, if we don't want to get lost, we need to do this.

VICE CHAIR MILLER: We could state that the third paragraph says, new referencing to impact all maps, charts, geographic information systems, surveying -- so in the third paragraph, there is a statement that it will effect everything. We could include GPS in there. I mean, it might be more impactful upfront.

MEMBER SHINGLEDECKER: I was one of those people who commented that it might be too technical. It's too technical for me, but I recognize that this is not my area of expertise. My concern was exactly that, if we could -- something upfront that gets your attention as to, okay, you know, maybe if you don't understand the technical details, understand that it's important that somebody else is, and these are the -- maybe, is there an example we can give of the kind of things that this is fixing or either avoiding and why it's so important?

MEMBER MAUNE: Kim -- I'm sorry, Lawson.

MEMBER BRIGHAM: And I agree with Larry. I think he's looking for a punchline like, national security, national economic impacts, I mean, it affects a whole range of security issues, I think, but how do you say that? I mean, I know it's technical, but I think it has to be, but there are no punchlines that a staffer can reach out and say that this affects everything.

It's what we're saying, but --

MEMBER MAUNE: You're lacking that upfront zinger, and that's what Kim specializes in over there. Kim, I wonder if you'd care to come up with an opening sentence for this paper.

MEMBER HALL: I'll work on it. This is, obviously, been one that's been a little bit over my head, for as technical as it is, but as my father used to say as I was growing up, where's the so what for the general person? Why am I going to read this? And that's why I am the

outspoken person for that bottom line upfront.

I just want to make sure that it isn't -- it doesn't lead the person to believe that they're going to understand everything else in the paper. As has been said by everybody else, hey, by the way, maybe you don't know what this means, but you should care to know that other people know what it means.

So I will work on that. It's something I'm going to put up right now.

MEMBER MAUNE: And if you can talk with Gary about that, maybe at lunch or something, if you two can agree on a zinger like that to start the paper, I think this one's ready to go.

MEMBER HALL: Sounds good to me.

MEMBER MAUNE: Thank you. Are we ready yet, Lynne, with the third paper? We're going to do it on the screen? Okay.

VICE CHAIR MILLER: Okay. A little background on this. This paper, we've been struggling with. It's very important, particularly to people like Ed Kelly and others on the panel, and we hear at every single meeting just how important PORTS is to the stakeholders in a community.

And there's other things that are also important from Sal Rassello, who's not here, he is a cruise industry person and is very aware of ever larger ships entering ports. So we probably had six different versions of this and this is something that Ed Kelly provided the backbone and then Kim and I did some rearranging and editing, and I'll give warning upfront here that we're talking about PORTS, precision navigation and high resolution bathymetric surveying in a much shortened form.

And this may not be satisfactory, but we needed something to work with. And we still have the original thing that Ed's group came up with. So this, I'm afraid, is going to have to be sort of a paragraph-by-paragraph. Okay. And so Ms. Bottom Line Upfront, you want to introduce the first paragraph? I'm sorry, Mrs. Bottom Line Upfront.

MEMBER HALL: Thank you. So this has been, and we all saw that there were some comments yesterday by Lindsay Gee, followed up by

Lawson, and I just sent out another email regarding what we were trying to do. I think we had been given previous advice that it shouldn't just be about PORTS. I think that Joyce and I talked about it being, you know, precision navigation is a nice follow-on. What do you do with the data that you get from PORTS? How do you integrate that into a useful and reliable product?

So what we have here, what we tried to do, and maybe it's not quite the zinger that we would normally have, and I happily provided that in an email this morning, that maybe we can add that in instead, but the intent here was to try to give a much broader overview of why we think NOAA should continue to prioritize and support PORTS prevision navigation like we've seen in LA-LB.

And so that's kind of what this first paragraph gets -- that we need to work on -- you know, NOAA can't go it alone. And we just saw the presentation yesterday of the plaque to, you know, seeing the Lake Carriers Association become involved in putting together a PORTS and being part of that funding and process.

So here what we've done in this first paragraph is just done a very basic overview about the services that NOAA provides and how invaluable we think they are overall. Then we move into, here's why it's important. You know, there's a real economic boon. I think the only data that we had, and I have looked in the past for what, maybe, the passenger data would be, as kind of the cargo that we see here provided by the report from AAPA.

I'm not sure if we need to go into that much, and I don't know if there's a better general way we can show that, but we thought it was a pretty important one, you know, 23.1 million jobs, $4.6 trillion, I mean, those are big numbers and those mean something, so we thought that that helped support the reason why these systems needed to be there.

VICE CHAIR MILLER: Can you go down?

MEMBER HALL: I'm not running it. Sorry.

VICE CHAIR MILLER: Could whoever is running the -- page down? Yes. Okay.

MEMBER HALL: And then we know that there's -- you know, we talked and Sal, and Ann, and Ed in Galveston had talked --

VICE CHAIR MILLER: Wait. Go up. Second paragraph first. We need to give people a chance to read it since we don't have written copies of it. Okay.

MEMBER HALL: So the second paragraph is where the numbers are there. You know, 95 percent of U.S. international trade moves through ports and harbors. That's a huge number; huge percentage. It's then broken down, using an AAPA study, into jobs, mostly related to cargo, again, I don't have the numbers for passenger, necessarily, which would also be a fairly high number, actually, between cruise lines and ferries, and the transport of people.

So from there, we bounce down to -- you know, and the talks we've had about this before, we're worried about mega ships, we're worried about other things that make these ports and harbors much more complex systems. So, you know, in an effort to do our most to be concise, we listed out, just kind of very generically, if this was going to be a mega ships paper, I'm not sure that actually is applicable for this particular committee, but we could do that as well.

And maybe we say that, we put, you know, larger and then define what larger actually means with regard to a mega ship. We went through and, you know, the waterway congestions, more and more people are turning to the water.

It's really hard when you're trying to keep it at two pages to go into depth about any of those things, and we thought a high-level intro, or a high-level highlight, was what would suffice here as we move forward.

We then, the next paragraph down, the annually, over 600 commercial vessels. This came out of, I believe, Dave, you quoted this out of the value of the PORTS system. I did see that we had a comment this morning from Lindsay that it was kind of out of place.

I think it's actually really important to show whether we know why they were caused or not, understanding that the safety of navigation and the efficiency of navigation, and increasing

that would obviously help us reduce accidents. Maybe we can't codify exactly how many it would be, but we know a lot of those can be created by people having bad charting, people don't -- you know, grounding because they don't have the right depths.

VICE CHAIR MILLER: There's a comment from --

MEMBER BRIGHAM: Yes, I mean, I think it's Lindsay and I have a problem with the way the --

MEMBER HALL: It's not on. You're not on right now.

MEMBER BRIGHAM: -- 600 ships, I mean, okay. Fine. Even the data that was given, the economic data, I mean, I think on the ship stuff it should reference the Coast Guard's statistics or something; very specifically. I mean, I see this as gratuitous. Throw it out there, and not justified, but where is it in the government's data -- you know, if it's 600? So that's what our issue is.

MEMBER KELLY: We got it from a NOAA report.

MEMBER BRIGHAM: Okay. Great. We should reference it then.

VICE CHAIR MILLER: I did and I need to check the actual title of that paper. That's what that comment is, NOAA Value of PORTS to the Nation.

MEMBER HALL: Yes, we were working on getting that footnote in there, we just hadn't gotten it, but that is a quote and we needed to put the quotes around it because it's a direct quote, but that was directly from the NOAA report. We wanted to reference NOAA and the value of the PORTS versus just generic Coast Guard stats at this point.

But it was a great quote that I thought Dave pulled out for us and the comments that we were going back and forth. We were trying to integrate not just Joyce and Kim's thoughts on this, but the comments that we'd received back from the panelists as well, including Susan, Lawson, Ed, and Dave.

So it's always writing by committee, we always know, is a little bit difficult, but we thought that that was, you know, key. We told

you how much things cost and now we think that, with all these things happening, to continue to invest in these systems would be huge for reducing, potentially, some of these 600 million, or excuse me, 600 accidents.

Maybe it's too generic, happy to put a couple other words in there, and looking for some insight as to how to do that.

VICE CHAIR MILLER: Could we make that the last bullet there? Because it's one of the issues and challenges. With quotes rather than a separate paragraph, although it's much, much longer. I mean, the reason we didn't was it doesn't fit.

MEMBER HALL: Right.

VICE CHAIR MILLER: Yes.

MEMBER MAUNE: I like that as a separate paragraph.

MEMBER HALL: I'll let you go, Joyce, into the next couple of paragraphs?

MS. BROHL: It's a technical correction, if I may?

VICE CHAIR MILLER: Sure.

MS. BROHL: Helen Brohl. Committee on the Marine Transportation System. It is commonly used, 95 percent, 99 percent of trade through the U.S. is on water. That's technically incorrect. That is a world transportation number. Through the United States, it is 72 percent of international trade by volume and 44 percent by value.

Those are DOT numbers by Bureau of Transportation statistics. So I know that we commonly use the 95, 99 percent, that is not a citable number for the United States. A citable number is 74 percent by volume and 44 percent by value, if you want to refer to just the numbers for U.S. maritime transportation through the United States specifically.

MEMBER MAUNE: Would you repeat those statistics again? 75 percent by value?

MS. BROHL: Yes, sir. It is, technically, 71.6 percent, so 72 percent by weight, 44.2 percent by value. And we can get to the citation after this if you'd like.

VICE CHAIR MILLER: Thank you.

MEMBER MAUNE: Thank you.

MR. ARMSTRONG: I guess I -- it's

important to get the details right and the statistics are often mixed together. They include imports and exports, local, you know, interior shipping, and exterior, so we need to be sure that in addition to the number, we have the -- what that refers to, very carefully laid out. Thank you.

VICE CHAIR MILLER: And those statistics in the previous paragraph came from -- they came from your wording and the AAPA report, but we'll make sure -- and perhaps that's something that NOAA can help us with in the final edit is to --

DR. MAYER: And if I could just chime in and maybe speak to Glenn or Admiral Smith, I think it's really important that the agency itself be consistent. I think we saw an example last night where one report comes up with one number, and from the same agency, another number, and when that gets up to a staffer, that really undermines credibility.

And so I think we have to be very careful that there's consistency. Whatever is chosen, just be consistent.

VICE CHAIR MILLER: Okay. Let's go down to the bottom of this page. The next section simply discusses what PORTS and precision navigation are. And this, Dave, I believe you wrote the PORTS part of it, did you not, the explanation of what it was?

MEMBER MAUNE: Oh, I probably pulled that off the website.

VICE CHAIR MILLER: Okay. So this was -- this is an explanation. Go down to the remains of that paragraph on the first page -- or on the second page. Okay. So it basically explains, and the figure as well, explains what the PORTS system is and, you know, all of the sensors that are included, and is it now 26 PORTS systems or is it now 27 PORTS systems?

MR. WRIGHT: It's 28 right now.

VICE CHAIR MILLER: Twenty-eight. Okay.

MR. EDWING: That number will be changing soon. It's a fluid number.

VICE CHAIR MILLER: Maybe I should say, in August 2016, yes, so that's general, and then the second paragraph on that page, I hope

that printed out correctly. Okay. Yes. That's correct. Here, guys. So we now have copies of this and people can look at it.

And we wanted to include here in this paragraph, the number of people that use it. And our recommendations are for federal recommendations and that is partly because not only does NOAA use these systems, but FEMA, Homeland Security, Coast Guard, just, there are, literally, hundreds of users, everywhere down to recreational boaters, being the little guys, and so -- and each PORTS system is somewhat different, depending upon the conditions, air gap sensors, you know, current meters, et cetera.

So this has been kind of longstanding in the writing. The third paragraph, which goes down, which is what Kim and I added, down a paragraph, okay. And this is quite short and I wrote it, and I'm probably not the best person to write about precision navigation. I saw it in Long Beach. So I would -- I said it's a -- my perception is that it's an expanded version of PORTS that integrates many of the sensors into ship motion models based upon ship parameters and water movements.

And then comes in the up-to-date data, which is what Sal really wanted included, from highly accurate bathymetric surveys, provide the information needed to determine safety margins when navigation -- I'm sorry, that should be navigating, in approach channels, and within the port.

And as we saw in LA, Long Beach, it is a system much like we saw on the DIS yesterday, that provides ship captains, pilots, and onshore personnel with information required to make good decisions.

And then let's go down to recommendations. Ed, for your information, having issues and then recommendations that really stated the same thing, Kim very much felt we should be positive here, rather than saying, this doesn't happen, here's our recommendation, and so we combined your issues and recommendations into the same one.

And again, notice we said federal funding. I was encouraged to hear from Glenn that the PORTS system was mentioned in the Senate

mark this year as deserving full funding, whether that gets to the point, so I'll give you a chance to read through the recommendations and see if -- and feel free to -- if you don't think this is the right approach, we've just been struggling with it for so long, and we wanted to get something ready to potentially go out.

One suggestion I would make to those who are specifically concerned with this is, we could follow this with individual papers on PORTS only, precision navigation only, or bathymetry only, with more detail on each of them, if we want to. I don't know if that's a good idea or not, so any discussion? Dave?

MEMBER MAUNE: My only discussion is that this was the main issue throughout the last six months is, is this one paper or is it three papers? And the three papers would heavily overlap one another. And we decided that -- well, we didn't decide, it was when Kim and Joyce got together and figured out that they could pull at least these two together, that it might make a good single paper that covered safety of navigation in many respects. Yes.

VICE CHAIR MILLER: Ed, feel free to object.

MEMBER HALL: Just really quickly before Ed -- I did, you know, when we got the comments last night from Lindsay Gee about this, you know, maybe there needs to be a more specific bottom-line upfront, and what I had come up with, and it's not exactly right, but something where NOAA should continue to support value-added seaport systems that increase the safety and navigation, such as PORTS.

Without such systems and the integration of their data into practical and reliable products for end users, U.S. seaports may encounter, I don't know if it's increased, significant impediments to the safe, effective, and efficient transfer of people and goods. That puts it right out there. That's how I would normally operate, but I know the way we were trying to put it together, that would make it go over two pages.

But that's, ultimately, what we were trying to do with the paper is explain that. And so, you know, I think we really needed, as Joyce

said, and as Dave had said, and we'll let Ed talk, I apologize, what is the purpose of this paper? Because I think, as we've gone back and forth, everybody has an idea and I think this is where we thought we came up with something that was a good third option to try to get as much of it together in one without going into too much detail or too little detail.

MEMBER MAUNE: Ed, would you like to speak next?

MEMBER KELLY: Just a couple quick comments. Motherhood, apple pie, the American flag, I don't think there's anybody against safety of navigation or the fact that we should disseminate this information, valuable information. The problem that I've consistently faced with this paper is that it can be tremendously complex. There are overlapping issues, and with a constraint to fit it on two sides of one piece of paper, and include a graphic, and leave room up on top so that we can get the banner about the panel, is a daunting challenge.

You know, I don't think it's possible to get safety of navigation into a two-page paper. I also feel that some of the overview and some of the backdrop might be extraneous. We have to remember who we are and what the purpose of the paper is. It's professional groups addressing professional groups. We kind of should all understand safety of navigation and with compressed space, there's not much room for prologue.

To combine PORTS, precision navigation, and bathymetry into one paper, I think is probably going to be too much. There's a possibility of breaker PORTS paper and then a bathy and precision navigation paper, perhaps, and I think if we can cut this a little bit more, we might be able to focus more specifically on PORTS.

Some of the issues that we're addressing here, clearly, are important. I don't know if we've blown it into enough definition. As an example, NOAA should work with federal and state governmental agencies, and other stakeholders, to provide consistent ongoing funding for these critical systems, is kind of

where we are right now, and very frankly, it doesn't work.

We have mentioned down further, the very large and broad-based numbers of users of this system, yet, almost without exception, if you go to see who is actually funding the O&M, it's Ports Authority and commercial shipping operations.

I think we need to be more specific in who we suggest NOAA go after, i.e., cost-sharing on O&M with other federal agencies. It should be a federal. That's how you provide consistent ongoing funding. And whenever something is everyone's business, it's nobody's business.

I would like to know how we're going to send a share of an invoice for O&M to the paddleboarders, to the kayakers, to the commercial fisherman, to academia, I don't know if you bill Navy, they're a big user, Coast Guard, there's, obviously, NOAA has a certain share of that as well, but I think it's kind of impractical. We're kind of painting ourselves into the same corner by suggesting, you know, and not really saying this has got to be a federal obligation.

And we can work with NOAA to perhaps find some way to construct that, but the reality is, these systems in some locations have gone dark in the past. The Port Authority, as an example, in New York, pays for ours. They have told us that as soon as the last piece of work on the Bayonne Bridge is done, they are ceasing payment. We have nobody else to pay for that.

It's a hodge-podge of port authorities, local agencies, there's some oil tax in California, the co-op group has some payments, it's just a dog's breakfast as far as getting this done, and it's really inconsistent, and it's unfair, based on who the actual end users of this are.

We go a big retinue here, I mean, how do we charge academia? They're big users. Maybe we should put in a 900 number and people will pay for it, whoever are the actual users can pay for it. We suggested that, not being facetious, in the past with New York, and we were told we couldn't sell government data.

So, you know, it continues to be a

problem and we may have to refine this a little bit more into PORTS itself. Also, in the line with the recommendations, I don't know if it's hard-hitting enough, but it says, update all technology for equipment processing, display modeling, and forecasting, and modeling and forecasting are key requirements we'd like PORTS to move into, particularly modeling.

You know, we have very accurate real-time data where the sensors are located. We don't have it at some other areas. If we could get accurate modeling where any mariner in any position would be able to basically say, I need to know what's happening right where I am, not where that meter is, that would be very helpful, and forecasting is also very valuable to us here.

So, you know, I think that's very key. Identify the users beyond commercial maritime is very important. I don't know how much outreach there's been to academia, to commercial fisherman, to recreational users, to OEM operators, first responders, et cetera, all of whom are using this data and may also have some requirements for the formatting.

So, you know, I'm a little bit embarrassed, quite apologetic, that we haven't been able to put this out. I certainly appreciate all the help and the collaboration that we've had, and I think the more collaboration in the work we've done, we've found, it's more difficult to do.

So that's just a few comments and I think it kicks the can down the road. I think we're very close to getting a PORTS paper together. I think we might dilute the issue a little bit by bringing in precision navigation and bathy requirements, and maybe that's a separate paper, because those two do dovetail much better, perhaps.

VICE CHAIR MILLER: But don't PORTS -- doesn't PORTS need accurate bathymetry too?

MEMBER KELLY: The more data we can get, the better. Is that currently an extensive piece of the PORTS product? Not to the degree that it is with, say, precision navigation.

VICE CHAIR MILLER: I mean, I don't -- actually, Lawson has a comment.

MEMBER BRIGHAM: I agree with Ed. I

think we've gone full cycle. I think this should be focused entirely on PORTS as the topic and that a more technical paper, which we started with, with Sal, myself, and Ann, that had a wiring diagram of what it means to have a large ship and all the technical issues, and all the responses, so I think this paper should be focused entirely on PORTS.

I don't know if I agree with Ed that it should require -- it should include the very sensitive topic of user fees. I mean, I'm hearing user fees and I don't know. I mean, I don't know if this is the paper to do that, although it's a huge topic, but then again, PORTS can be the public/private partnerships, the federal/state relationships, and what we talked about yesterday, so maybe that theme could be rolled in.

But I'm sorry, we've gone kind of full cycle here, but I don't think the safety issues can be combined all in one mega paper that Ed tried to do.

MEMBER MAUNE: Well, last night I got the impression from Ed that this paper was pretty close to being ready and maybe would take about ten minutes of work to straighten it out, but right now it sounded like you want to deep dive the whole thing, or whatever you call it, and --

MEMBER KELLY: Dave, based on the comments I've seen, even just, you know, last night, I don't know if it was last night, Lindsay had sent something, I think we could tweak this and perhaps, you know, if we could dive a little bit -- my original opinion on this is, if we could dive a little bit deeper into the PORTS funding issue, and into the modeling and forecasting issue, and perhaps, at the expense of the space on the two-page paper of trimming back precision navigation, I think it can still work.

MEMBER MAUNE: Is this possible to be salvaged by tomorrow if we can have a revised version to review tomorrow? I think we have a little time on the schedule tomorrow, don't we Lynne?

MEMBER KELLY: I would think that if we could sit down with interested parties, in about 15 minutes or so, to maybe a half hour tops, we could probably knock this into something

that's useable. That's in my estimation, anyway.

MEMBER MAUNE: Oh, Susan.

MEMBER SHINGLEDECKER: I just wanted to echo that, as I read it, you know, today there are 26 or 29 PORTS systems. To a layperson hearing that, hmm, that sounds pretty good. We're doing all right. I don't think it -- there isn't that piece. I was wondering, almost, if there is a graphic that shows, you know, ports that are federally funded, ports that -- you know, the different funding mechanisms and how stable they are.

How long do we have certainty of that funding that might convey where the gaps are and where the gaps may soon be, and how fragile and dicey the funding situation really is, and how it is kind of hodge-podged together, if there was a way to do that, because as I read it, 26, 29, I think there are a lot of people that would pat themselves on the back and say, we're doing all right.

And to get that funding urgency in there, I agree, is really important.

MEMBER MAUNE: Yes, Andy.

MR. ARMSTRONG: I'm sort of of the opinion that we can't merge precision navigation, and bathymetry, and PORTS in this single paper at this point, and I don't think it's correct, as this paper says, that precision navigation is a kind of port system, or even, in fact, a system.

It's a concept that can happen, you know, with lots of different kinds of data input and I think we've -- I think if we want to get something out for this meeting, we should just go with PORTS.

MEMBER KELLY: Andy, Ed Kelly here, yes, I would kind of agree with that. I think, as my comments are, I think we need to be a little -- delve into the depth a little bit more regarding the funding issue and the requirement for the expansion of modeling and forecasting.

And with the limited space we have in the paper, to kind of take the issue of precision navigation out and park that in a separate paper, but I think that's very doable in a pretty quick piece of time here.

MEMBER MAUNE: Who would you work with?

MEMBER KELLY: If we could just sit down without microphones and a couple of pencils, and whoever wants to get involved in the wordsmithing of it.

MEMBER MAUNE: Who wants to work with Ed on that today?

MEMBER HALL: Yes, I think the biggest piece that we maybe missed, and this is just kind of in the iterations that we've, kind of, seen where this is going and the objective has changed slightly, is that we have not in any way explained the vulnerability of the PORTS system, which is the funding piece, and I think that that's really a key piece.

Hey, you've got it. It seems to be going really well. You've got 29 sites, or 28 sites, this sounds great, but hey, New York's is losing its funding soon and if there's a couple of examples we can give to show that it's a vulnerable system, that is, maybe, where the objective here is, so happy to help.

VICE CHAIR MILLER: And that more systems are needed.

MEMBER HALL: Indeed.

VICE CHAIR MILLER: Yes, as we've heard here in this meeting.

MEMBER HALL: Right.

MEMBER KELLY: And the component of modeling and forecasting is essential. The two really make the product more usable. Yes. But having just said that, it's fairly simplistic. We've got the bulk of it, I'd say, and by taking out the space that we've devoted to precision navigation, we can put those comments back in and then just wordsmith it to fit.

MR. EDWING: And I'm more than happy to sit in and be a technical consultant, so to speak.

MEMBER MAUNE: Okay. Ed, is that a go for you and Rich, and Kim? Anybody else? Not Joyce?

VICE CHAIR MILLER: No.

MEMBER MAUNE: Okay.

VICE CHAIR MILLER: I've written enough.

MEMBER MAUNE: You've written enough. Okay.

MR. BOLEDOVICH: I'll provide some

reference materials for the contribution background.

MEMBER MAUNE: Well, with that being said, we are ahead of schedule as far as reviewing the issue papers that we had planned to discuss today and hopefully finalize today. Perhaps we can use the remaining time to discuss future issue papers. What do you think, Joyce?

VICE CHAIR MILLER: Sure. I mean, I don't think it will take that long. If this is only a PORTS paper, we obviously have a precision navigation/bathymetry paper that needs to come up, and there was already -- Anne, were you working on that already?

MEMBER MCINTYRE: We've had a number of iterations on and trying to decide where it ends up as far as integrating the PORTS and pulling it out. I agree that it's a good idea to pull precision navigation out of PORTS and just address PORTS.

MEMBER MAUNE: Okay. For next time, then, will you be drafting a precision nav paper?

MEMBER MCINTYRE: Sure.

VICE CHAIR MILLER: And, Anne, was there something you wanted to show at this time?

MEMBER MCINTYRE: If we can capture my desktop here. I just wanted to show you how we're using all this information together being, you know, integrated. I just wanted to show you the navigation system that we're using on our laptops and I think we're setup and ready to go with that.

So I just wanted to show everybody, very quickly, how we're using all the information that we get from NOAA, that we get from the Army Corps of Engineers, and how it integrates into, you know, something that's useful.

So what you're seeing here, this is just like a baseline of our Portable Pilot unit, and we can layer different information that we get from different entities on this. So this is the Port of Longview in Washington and right here, you see some ships on here, and this information is all being received over AIS.

And so, here, I can layer an ENC on top of it. Here comes the ENC, and you can see -- it's not working quite right, but you can see there's a little bit of data here, and what I

wanted to point out is, so we can see some survey data here on the ENC.

And so the next thing I'm going to layer on top of this now is the Army Corps soundings. And see, now it gets to a point where the information is useful from a navigation standpoint. Again, just kind of having little spot soundings that we have from the survey, you know, it's good information, but it's not enough.

So what you see here are Army Corps of Engineer soundings that are layered on that, and I'll try to zoom it in a bit more, and you can see all the soundings here now. And then, in addition to that, we can add surveys from terminals, so we have private soundings that we can put on top. And now the information becomes really useful because we've got Army Corps of Engineers' surveys, we have the NOAA, you know, ENC, and we have information from the private terminals.

And you can see here where the soundings are a bit closer together and now we really have information that we can work with. And then the other thing that I wanted point out to everybody in what we do, so now we have all the surveys, we have the physical features of the docks, and when you really zoom in, you know, we're even seeing little fenders where we come along side with the ship.

So you can see all this has been entered, but what's unique about our system and what we're moving towards nationally is that we're receiving all the PORTS data into our system. So over here, every one of these over here is a PORTS gauge, it's a river level gauge, and so right now I know that at the various stations, so I'm saying, Skamokawa, for instance, we have on the gauge, it's 3.2 feet and it's falling.

And so that's my real-time information what the river level is at that location, and then again, it's updated every six minutes. So when I'm moving a ship down the river, I can look ahead and I can see what's happening ahead.

And then, some of the stations have additional information besides the tide level. It's not working that great, but -- well, you can't get it in there, but again, it's got the

wind speed and direction. And so the point in showing this is that when we have all the information from the various agencies integrated together, it really becomes a useful tool.

And when you only have, like, one piece of the information, it's good, but it doesn't work in the way that we need it to.

VICE CHAIR MILLER: What is the software, Anne?

MEMBER MCINTYRE: This is the software, it's called Transview 32, and it was developed by the Volpe Center, which is a part of the Department of Transportation, and they do a lot of public/private partnerships. And the St. Lawrence Seaway, the information we saw from them yesterday, had a component of it. It's used in the Panama Canal, and my understanding, it was also setup that the railroads use it a lot because it has predictive features and it's not moving very quickly.

You can see, here's a ship coming up the river here right now, where we can predict where we're going to meet and pass vessels in real time at any point on the river, and I don't know -- it's moving pretty slowly. I can try to show that. So here is, like, we call it the blue dot, but here's a predicted meeting point of, you know, in time of when this ship is going to pass this.

And so for everything, it's kind of a silent Vessel Traffic Service, where you can see where you're going to pass all the ships, but the point in this is that, unless you can layer and integrate the information, it's not particularly useful just having one thing.

So some of the other things we can pull off of this, like, you know, we have ETAs for various points up and down the river. And then if I wanted to know how long it was going to take me to move up, you can get time to go just by moving, you know, your cursor forward you can see, you know, what time you're going to be at a particular spot.

And then, like, in-house, we've added information and so it's enabled us to better utilize our anchorage areas, where each of these little yellow dots, you essentially put the bow of the ship on this dot, you drop the anchor, and

so now we can anchor ships more closely together than we used to be able to in the past when you were not able to be so precise, I guess, in your navigation.

So here's another example of, kind of, the layered soundings, and I'll pull those off just so you can see, so I'm removing, like, the private soundings. So I can remove the ENC, that takes another layer away, and now I'm going to remove the Army Corps soundings that you see right here. That's just one little bit of shoaling.

CHAIR HANSON: Well, thanks, Anne. I think I hear a lot wheels turning. How do you get the data?

MEMBER MCINTYRE: So I can show you very quickly. So we can download the data immediately from the Army Corps of Engineers' website, and I'll do a download here real quick just so you can see it happen. It works really well. So you go to work and it's like, boom. So all the private soundings are on here, all the Army Corps of Engineers soundings are on here.

Like, when we update the ENC, we have to just manually load that into the system to have that information. It's almost done.

MR. ASLASKEN: So, Anne, as part of the software service, they set this up where you can go and gather all the -- they gather the data for you?

MEMBER MCINTYRE: Yes, the Volpe Centers set it up and for the Army Corps of Engineers, we essentially, it logs into their server and we download the information. And so then again, it shows you how it's updated and then if I were to start the software again.

CHAIR HANSON: Next question is, how do you get the private terminal data?

MEMBER MCINTYRE: We call around and we ask for it, you know, within that. And then, you know, every year we kind of have a list that we go through, we ask for it, and we coordinate. We have about three companies that do surveys and we just let the ports know, if you want to bring in these deep ships, we really need to have the information and it needs to be timely, and it works pretty well.

And so again, here, these are all, you

know, you can see all the traffic in the system here too.

MEMBER KELLY: Virtually, every port pilotage group has got some version of this software that does, basically, the same thing. It's very locality specific and it pulls in data, either automatically, like, from the Corps, or you can just create links, or you can aggressively go out to Port Authority terminal operators, et cetera, to get the private information and input that and use that.

So there are systems like this in virtually every major port where the pilot organizations setup the systems and then populate this for the PPUs, the portable, or personal pilotage unit, the hand-held-type devices, that they'll take with them onto the ships to utilize.

This type of system is not available on just regular commercial vessels, even large commercial vessels. Obviously, recreational users or others are not going to get this type of thing, so this is a very sophisticated system for a specific locality, just to kind of frame what we're looking at right here.

But each major port, their pilotage groups have implemented this type of a system.

RADM SMITH: Can I ask a quick question? And that is, so is this the right model for you to do this?

MEMBER MCINTYRE: Absolutely.

RADM SMITH: So every -- I guess I'm just trying to, you know, every once in a while NOAA gets scolded for not doing this, right, with the Army Corps data, why aren't you bringing it in and providing more soundings, or that sort of thing, and we could, because we have access to all the same data, but so I'm hearing two different things, both that we should be doing this, and that we don't need to because you're already doing it.

MEMBER BRIGHAM: I think in ports where there are hundreds of very large cruise ships that, maybe, NOAA ought to provide, and maybe we should be selective based upon, well, this mega ship issue. I don't know. Is it the sole domain of the pilots or is it for this very integrated and microinformation, or should it be provided to certain users because of the safety

considerations?

RADM SMITH: I guess I would also note that we spend a lot of time, but what we do is spend all our time getting rid of all that extra information, right, just simplifying it down. And that's a huge resource and nobody seems to be using it. In fact, you seem to be going back and undoing everything that we did to simplify it.

And so I guess I'm wondering aloud whether we should be changing the way we do things so that we do provide more information at lower costs to -- through the, sort of, official navigation distribution channels.

MEMBER KELLY: The issue with data is always, how do you process it and use it? And I think the broad range of users involved, obviously, you know, a pilotage group is going to need this type of information, recreational users, other tug barge operators, et cetera, may or may not. The beauty of the electronic charts is the ability to layer.

And as Anne just showed, when you can make it more or less detailed, depending on your need, that's essential to have that option that it's there.

VICE CHAIR MILLER: One thing that we've discussed in other -- for instance, well, in Galveston, is that less sophisticated users don't know where to get all the data, and it was particularly on the ICW that we were discussing it, because Army Corps District A had this data, and you had to go to their website and know how to get to it, and then the next district had a different website.

And how many people on a 20 to 50-foot sailboat are going to know which Army Corps District they're in right now? This is a very different application than the Columbia River where you've got -- you know, but I think the frustration is, I mean, we had the Army Corps guy here say that, you know, everything's available in a pdf. How do you merge that with the NOAA data?

RADM SMITH: To be fair to him, he did say, pdf, XYZ, blah-blah, blah-blah, it was a list of things, and we've insisted, pdf is not easy to work with for mapping purposes.

MEMBER SHINGLEDECKER: Yes, I would

just kind of echo what Joyce said. I mean, that's beautiful. And, I mean, especially on the ICW, I mean, figuring out the frustration between if there's more current data out there that Army Corps has, how can we get it into one place so that every user can benefit from that data that's already been paid for, already been collected?

How can we -- because exactly what Joyce said, and that's what I say all the time, I'm really lucky if I can get my recreational community to regularly update the NOAA charts that they have, but they're not going to go to every different Army Corps District website. They don't even know what an Army Corps District is or that they just transferred between one to another as they were heading up or down the ICW.

So if there's a way to make that product more dynamic, that'd be great.

MEMBER MAUNE: I'm wondering what Anne envisions for the precision nav paper; some of the main points you'd like to cover.

MEMBER MCINTYRE: Accuracy and understanding what the data is based on are the things that are important to me. I need to understand how the datums integrate. You know, when you're dealing with inches, you need to understand how things are derived and everything needs to be on a common platform, if that makes sense.

And again, being able to layer it and being able to have it perform in real time is what we need.

MEMBER MAUNE: Okay. And how long will it take you to prepare your first draft of this paper?

MEMBER MCINTYRE: A couple days.

MEMBER MAUNE: Have a question in the rear? Can he get a microphone, please?

CAPT SMITH: Hi. Good morning. Scott Smith again. I'm the Chief of Navigation Systems Office at Coast Guard Headquarters, and the owner of the NDGPS system within the United States, so if I may make a recommendation in the paper, if you choose to do so, is tout how important or non-important NDGPS is to your systems and how you're getting that precision navigation piece as far as your position from PNT.

Are you using DGPS or WAAS, or what

you would use for that correction, because I think that's a key component, if you could add that in there. It's one of the things we struggle with from our end, just seeing how valuable NDGPS is. If you saw the recent shutdown of some of the system on the inland side. We've protected the marine side, but I'm not sure how long we're going to be able to do that.

So the information from bodies like yours would be important for us to have.

MEMBER MAUNE: Okay. Thank you. Okay. Brigham? I'm sorry, Lawson.

MEMBER BRIGHAM: It's Lawson Brigham. We want to make sure that we chat with -- I'll work with you, Anne, also get Captain Rasello to weigh-in because at the beginning, he showed us a graphic, showed, with these large cruise ships, have a lot of windage, heeled over, and what that meant to the whole dynamic of precision navigation, so I think we'll get Captain Rasello to weigh-in on this one as well.

MEMBER MAUNE: Okay. And we're trying to have three issue papers for next time. Do you envision one, Ed Saade, on technology?

MEMBER SAADE: Not yet. I think we have a -- you'll see when we present later on, there's still a lot of weeding out on what we're going to focus on.

MEMBER MAUNE: Okay. Suzanne, we had been talking about recreational navigation for a long time.

MEMBER SHINGLEDECKER: I'm hoping that I can have a draft for you, but the earliest would be in January.

MEMBER MAUNE: Okay. That's --

VICE CHAIR MILLER: Dave?

MEMBER MAUNE: Yes, Joyce.

VICE CHAIR MILLER: I have a -- I've been thinking about one. The vital role that -- and I think you mentioned this, someone else mentioned this, that NOAA plays in emergency response, and that would look over the role of the Navigation Managers in coordination, both before and after, the role that the NRTs and the NOAA ships play, not only in aftersurvey, but how the ships function as, you know, to provide, in some cases, lodging, in some cases, electricity,

and sort of a, I don't know if it's OCS' role or NOAA's role in emergency response, just to highlight the importance of that because it's a very -- you know, I've heard such praise of all the people, the Nav Managers, and the NRTs, and stuff after, you know, in New Orleans, in New York, et cetera, so that's one idea for a paper.

MEMBER MAUNE: Do we have anybody on our panel qualified to write on that subject?

VICE CHAIR MILLER: I can take a cut at it. I mean, I think we have an idea, and talk to people in OCS for --

MR. ASLASKEN: Joyce, I think it's much broader than just that aspect of it. I mean, there is a National Response Framework, which NOAA has several different entities part of that the FACA actually does have oversight over, so I think it'd be broader than just, you know, the shipborne assets that do that work.

In fact, we have pre-mission assignment agreements with FEMA now that not only include the shipborne, but the airborne assets as well as onsite coastal advisors that probably could be brought into this. And I know Glenn stepped out, but Glenn's kind of the expert on it, because actually, Glenn was kind of lead on that with working with FEMA to get that broader NOS aspect with FEMA brought to the table and then the agreements, have them in place.

And in fact, you know, we've been mission assigned twice this year just for the airborne part of that. That'd be a good highlight.

MEMBER KELLY: Joyce, I could work with you, and perhaps it might be good just to throw things against the wall and see what sticks, because there are various layers and applicability, but we have quite a bit of experience from Sandy, and I can help you with the Coast Guard piece of the MTRU, the Marine Transportation Recovery Unit, and it's, you know, under Coast Guard command, but NOAA played an essential part, particularly with NRT capacity, to clear channels, and we were reopened in 48 hours after Sandy.

But it did require the surveying and the deployment of a lot of the NOAA assets and the teamwork that went into that, and, you know,

basically, you know, commercial port recovery.

MR. ASLASKEN: And one thing from Sandy that did not happen is still the awareness of the capability from the hydro assets that what NOAA can do, especially when the ports shut down, you know, I know this from just working with remote sensing coordinator at FEMA and those things that, you know, that awareness needs to go up.

MEMBER KELLY: Yes, definitely. I mean, we had the, kind of, boots-on-ground experience, but we -- you know, in the aftermath, what we did find is that there were other assets, including NOAA assets, that may have been available that people were not aware of at the time, and I think by identifying the response capabilities, it could be helpful.

It'd be a dynamic tool, really, to put out to any port or any estuary because the awareness level just wasn't there. I mean, we, New Yorkers, consider ourselves fairly sophisticated and we had, you know, table exercised a lot of this stuff and we still were not aware of some of the assets that were available.

And, you know, bottom-line, you know, if you can make it in New York, you can do it anywhere. If we didn't know it, I can guarantee a lot of other people didn't know that also, and it might be worthwhile for us to try to find a path forward on identifying that and, you know, impelling, perhaps, you know, in a paper, charging NOAA to take a lead position on putting together a response capability.

MEMBER MAUNE: Okay. Is this something, then, that Joyce and Ed can work together with and maybe you consult with Mike Aslasken to pull this paper together?

VICE CHAIR MILLER: I think Shep had --

RADM SMITH: I was trying to sneak in one more topic before we break. After you.

MEMBER THOMPSON: So, Dave, we've had a lot of experience with Mike on the airborne, so I can help with the airborne capabilities of what NOAA provides. We've used it quite exclusively in North Carolina.

VICE CHAIR MILLER: We're going to

have to -- I didn't know if the hydrographic, because we're the Hydrographic Services Panel, I mean, I understand that it's a much, much broader thing than that. And, you know, it may not even be an ask or a recommendation, just an informational paper of the --

CHAIR HANSON: Why was the port restricted for three days then? Hydrographic services, right? Couldn't get the port cleared.

MEMBER KELLY: Yes, no, we had the channels cleared in 48 hours, you know? We can go into the some of the problems we had and some of the solutions, and NOAA had played a very active part in finding some of those solutions. We didn't know what had washed over and what was under the water in the channels, if anything, containers, debris, you know, but there were also some other pieces that we really kind of weren't too clear.

So I'm thinking maybe we just kind of sit together and frame what the paper might look like, and it might be a request for NOAA to either enumerate or take a lead position on creating a response template of some sort.

VICE CHAIR MILLER: Okay. Let's take it offline then, but it's one suggestion for a paper.

MEMBER MAUNE: Okay. Are there any other suggestions for papers? Admiral, did you have a topic you want to propose?

RADM SMITH: Well, I guess I wanted to raise an issue that's one of, you know, were you to ask me would I lose sleep over at night, I did want to raise one issue, and actually, Anne, your Exhibit A here. If you could bring up one of those Army Corps surveys in there. Does everyone remember the Athos?

So Ed and I were talking about this last night. The circuit court ruled on the liability for the Athos grounding a few years ago. As you probably remember, it was a, I don't remember what kind of a ship, but it tore a hole in the bottom on an anchor, on a disused anchor, an anchorage in New Jersey, spilled loads and loads of some sort of, I guess it was fuel oil, might have been what they were carrying, in the river, and it was, you know, $100 million to clean it up.

There's a 193-page ruling on this that I will not attempt to summarize, I'm not a lawyer, but in the end, they split the liability for the spill between the facility -- interestingly, not the ship, but the facility, which had guaranteed a safe berth to the Athos, and the Federal Government, for failure to find the anchor, essentially.

But if you look at how the Federal Government is organized in our hydrographic services, to find things like anchors and anchorages, right now, that's nobody's job, because the Army Corps does sort of volume-type surveys, primarily for dredging, often sparsely-spaced single-beam lines, like the ones you see up here, and because the Army Corps has the surveying responsibilities in federal projects, including anchorages and channels, NOAA does not systematically and regularly survey them with our object detection standards.

So there's no reason to think that anyone would find those anchors and whenever we do -- occasionally, we will, NOAA will, survey straight over an anchorage or channel because it's easier than stopping while we're doing a large survey, and almost inevitably, we will find things in the channel that are dangerous to navigation.

And so there are a lot of things between those lines on those Army Corps surveys, and I don't want to say that the Army Corps is doing it wrong because they're doing it right for what it is that they're doing, which is, channel condition surveys in order to determine when to dredge. They don't consider it a mandate to do object detection surveys.

Which means that, in the end, some of the most critical waterways in the United States are surveyed at a lower standard than many of our coastal areas. So this is out there as an issue that I have opened conversation with the Army Corps at a high level on this issue. We do not yet have a, sort of, way ahead, but, you know, this was a tragic oil spill and did end up costing the government a whole lot of money because of this underlap.

So oftentimes, you know, I'll be testifying in Congress next week, they're going

to be trying to quiz all the federal agencies up there to find out how we're really overlapping and doing each other's business. This is a case where there's a serious underlap between the work of the federal agencies.

MEMBER MCINTYRE: I think people may have read in the press that we had a ship that hit a charted obstruction. And so here, without the ENC, you don't see the obstruction. I'll layer the ENC on there, and there it is, and so we had a ship tear about a 5-meter hole in the side of the ship when it hit this due to a miscommunication in the steering.

And it isn't something that shows up normally on the Army Corps of Engineers' soundings. That was something that was identified through the NOAA survey. So again, you can see the Army Corps survey here, you see 56 feet, you see 32 feet, but this was the sounding that mattered.

MEMBER MAUNE: Lawson?

MEMBER BRIGHAM: Yes, Lawson Brigham. I mean, it may be the topic of NOS and Army Corps. I mean, every meeting we go to we hear this overlap and bit of tension, and, you know, responsibility. I mean, maybe that's a paper to put on our list. Maybe we don't know enough, but we've heard a lot, to write a paper, but it is a topic that comes up every meeting.

CHAIR HANSON: Dave, can I swap my defense paper to work on this one?

MEMBER MAUNE: You may, Bill.

CHAIR HANSON: Thank you. That's something I can actually understand.

MEMBER MAUNE: Okay. Thank you. Well, we're out of time. Sir, if you'd like to take over.

CHAIR HANSON: All right. Well, thank you again. It's a lot of time and effort. I've been on a couple other FACAs, I don't think I've been part of one that works as hard as this panel. In fact, even this morning, looking around, and I think we had 100 percent participation by the panel, and great participation by the audience, and that's really what these types of discussions are all about, so appreciate your leadership --

MEMBER MAUNE: And I want to thank

Joyce and Ed, and Kim, and Gary, and everybody that -- Lawson, and everybody that provided input for these papers. We couldn't have done it without you. They did such a great job. Thank you very much.

CHAIR HANSON: Thank you, sir. Then we're going to take a short break. We'll be returning at 9:45 for a panel discussion. We have Ms. Deb Lee leading the panel and so appreciate everybody being back promptly at 9:45 and we can participate. Thank you.

(Whereupon, the above-entitled matter went off the record at 9:34 a.m. and resumed at 9:50 a.m.)

CHAIR HANSON: Okay. Appreciate everybody getting back almost promptly, plus or minus. Being a contractor, that means a lot to me. So we're going to have our panel discussion this morning on hydrographic services and this morning's panel is going to be moderated by Ms. Deborah Lee, Director of NOAA's Great Lakes Environmental Research Lab, known affectionately as GLERL.

Ms. Lee, thank you for being with us, leading your panel, distinguished panel. As Director of GLERL, Ms. Lee is responsible for overseeing and leads NOAA-sponsored scientific research on ecosystems of America's north coast, the Great Lakes, and the Great Lakes.

Before joining NOAA, she also worked for the Ohio River Division of the Army Corps of Engineers. So, Deborah, please begin with any remarks and we look forward to your panel.

MS. LEE: All right. Thank you very much. It's very much a pleasure to be here and be here with my panel members, John Allis, with the U.S. Army Corps of Engineers, Jackie Adams, with Environmental Protection Agency, Great Lakes National Program Office, and Tom Crane, Deputy Director of the Great Lakes Commission.

So we're all very excited to be here today to tell you why the Great Lakes are unique from the coastal areas, the ocean coasts, and why we need hydrographic services. They are actually foundational. The data that they provide are foundational to the management of the Great Lakes.

So the Great Lakes region faces unique

challenges in water resources management and environmental restoration. The dynamic nature of its climate and of the Earth's crust requires state of the science hydrographic services to provide the foundation for lake regulation, water management, navigation, sediment dredging, and environmental restoration of the near shore.

This panel today will examine these challenges and will discuss potential measures for improvement of services. Let me take a few minutes to give you a little background on the Great Lakes to help set the stage for our panel's presentations today. Here we go.

Even for residents of the Great Lakes, it's hard to grasp the magnitude and the complexity of the lakes. The Great Lakes are the largest freshwater ecosystem on Earth, they hold 6 quadrillion gallons of freshwater, which is 20 percent of the world's fresh surface water, and 95 percent of North America's surface freshwater.

As we look ahead at the next generation of NOAA's hydrographic services for the Great Lakes region, we anticipate numerous challenges, such as a growing population, an increase in demand for water withdrawal, and the need to continue to prepare for a changing climate.

One-third of the North American population lives in the Great Lakes watershed, and some of the most urbanized regions, like Cleveland, are in the United States and Canada can be found around the Great Lakes. The Great Lakes affect many human lives, they supply freshwater to more than 40 million people, they're a source of drinking water and food, as well as mineral and energy resources.

The waters of the Great Lakes also sustain an incredibly diverse biology of plants, animals, fish, birds, and even microscopic algae and crustaceans. The Great Lakes and their respective watersheds and waterways, and the ocean, are all connected.

Shown here, you can see the system in profile. Within the Great Lakes system, water flows from Lake Superior and Lake Michigan to Lake Huron, through Lake St. Clair into Lake Erie and over Niagara Falls, and then into Lake Ontario before flowing through the Saint Lawrence

River into the Atlantic Ocean.

Lake level is defined as the height of the Great Lakes relative to sea level. Lake level changes are caused by variations in precipitation, evaporation, runoff, and snow melt, as well as wind and waves. While tides are typically not discernible in the Great Lakes, seiches are common in the lakes.

A seiche action is similar to that of water sloshing back and forth in the bathtub, something many of us might recall from our days as children, or for those of us who have children, they like to play in the bathtub in that way.

But on a slower timescale, decadal to centennial, the Earth's crust under the Great Lakes is rebounding following the retreat of the last glacial period. This lifting is not at an equal rate across the Great Lakes. The northern and eastern shores of the lakes are rising with respect to the southern and the western shores.

And so in short, by example, water levels are getting shallower in Georgian Bay, on northern Lake Huron, and they're getting deeper in the Chicago area on southern Lake Michigan shore.

Lake Superior and Ontario are regulated by man-made structures at their outlets, and the outflow from Lake Erie is split between hydropower generation and flows over Niagara Falls. Many people don't realize when they look at Niagara Falls that they're not seeing the total amount of water. They're only seeing, roughly, about half the amount of water that leaves Lake Erie because the other is being diverted through hydropower tunnels around the Falls.

Navigation locks allow shipping to transit to steep changes in elevation in the St. Lawrence, Niagara, and St. Marys River. So accurate water levels are critical for managing and predicting the flow of water through this complex system.

Captured here is a dramatic image. It's water evaporating from the lakes surfaces. It's an unusual orientation because you're actually looking across Lake Superior from the west to the east, and then you can also see Lake

Michigan stretching there across the picture.

But the Great Lakes warm by absorbing solar radiation and they lose heat by evaporation and by warming the overlying air when the atmosphere is cool. After water vapor is released into the atmosphere, it condenses and form precipitation, some of which falls within the Great Lakes Basin, and some which is carried outside of the Great Lakes Basin.

The lakes modify the local weather climate because of this. Water temperatures -- because water temperature changes more slowly than land temperatures, lake waters gain heat in the summer and then they release that heat during the cooler months. This results in cooler springs and warmer falls, delayed frosts, and something Cleveland and Buffalo are both well-known for is lake effect snow.

The Great Lakes have a significant influence on regional climate by absorbing, storing, and moving heat and water, and lake effect precipitation can occur downwind when major weather systems move over the lakes.

So the Great Lakes water balance is complex. No two years are alike when it comes to Great Lakes evaporation, ice cover, and water temperature, and long-term changes in the lakes' water balance are also occurring as a result of climate change.

Continued observations over each of the Great Lakes is needed to better understand the seasonal, inter-annual, and long-term variations. Of critical importance is NOAA's Great Lakes water level observation network in determining the Great Lakes' water balance. Again, it's one of those foundation pieces of data that we need in order to manage this system.

You'll be hearing more about our Great Lakes water budget from John, who will be our first panel speaker, and NOAA's hydrographic services are crucial to the Corps' mission of regulating Lake Superior and Lake Ontario, and to the Corps' navigation and harbor maintenance mission.

Over time, use of the Great Lakes resources has had significant impacts. The future sustainability of the Great Lakes resources depends on our understanding of those

resources and their potential and their limitations. Fortunately, our understanding of the threats and challenges facing the Great Lakes' ecosystems has grown, and NOAA is working to provide the information, the services, and the on-the-ground action needed to address them.

One such challenge is managing sedimentation. Shown here is a color image of the complex sediment transport in Lake Erie. You'll hear more about our collaborative efforts in addressing regional sedimentation management, and dredging, and near shore restoration challenges from Tom Crane.

The Great Lakes have been dramatically degraded and challenged by human endeavors since European settlement. Basic ecosystem processes have been restored through individual and collective efforts, but proper foresight and informed decision making will continue to ensure that the Great Lakes are a model of environmental protection, restoration, and innovation.

The Great Lakes Restoration Initiative, begun in 2010, has provided a large infusion of funding for sustainable Great Lakes restoration. NOAA is fortunate to be working with the Environmental Protection Agency, and 15 other additional federal agencies, with funds provided by the Great Lakes Restoration Initiative.

So the areas that we're targeting include cleaning up Great Lakes areas of concern, preventing and controlling invasive species, reducing nutrient runoff that contributes to harmful nuisance algal blooms, and restoring habitat to protect invasive species, and then of course, also, science-based adaptive management.

The Great Lakes Restoration Initiative projects have already yielded tangible successes and distinct progress in alleviating some of our most pronounced threats to the Great Lakes and the region. You'll hear more about this from Jackie Adams' presentation and how we, at NOAA, and our hydrographic services, are supporting that restoration.

So the Great Lakes are affected directly by the decisions and actions of people throughout its watershed, which include parts of states of Illinois, and Indiana, Michigan,

Minnesota, Ohio, Pennsylvania, New York, and Wisconsin, and the Canadian Provinces of Ontario and Quebec, and also tribal lands.

We've had a great long history, a successful binational stewardship, that's working to ensure their sustainability now and into the future, and NOAA's hydrographic services continue to provide the observations and the services which serves that foundation for our stewardship.

So we hope you'll be able to provide feedback and input to NOAA's Hydrographic Services Review Panel via the following, if you're on our webinar, there's a comments and questions function where you can submit feedback, and this will be shared and become part of the public record. You can also email in advance, or during, or post the meeting, to lynne.mersfelder@noaa.gov, the HSRP program manager, or to hydroservices.panel@noaa.gov.

So at this time, what we would like to do with this panel is pause in-between our presentations. If you have some questions you would like for clarification or additional information, we'd love to take those questions, but what we'd like to try and do is hold the discussion until the end of our presentations so that you get to have a sense of the full aspects of water management responsibilities and how hydrographic services support those.

So at this time, I'd be happy to take any questions anyone may have regarding my introductory remarks. Okay. Have you all had a chance to play the question trivia, Great Lakes trivia? Okay. Great. So you've got a good introduction.

So then without further ado, let me introduce John Allis. He and I had the opportunity to work together when I was with the U.S. Army Corps of Engineers. He's in the office where I first began, in the Detroit district, and he's responsible for not only overseeing Lake Superior regulation, he's also the U.S. Chair of the Coordinating Committee on Great Lakes Hydraulics and Hydrologic Data.

And you'll hear more about the importance of that interagency committee in John's talk and in my talk this afternoon at lunch, so, John?

MR. ALLIS: Thanks, Debbie. Can you guys hear me all right? All right. Maybe just start on the next slide, please. I got it. Thank you. So looking around the room there's probably a bunch of you that may be experts on the Great Lakes as far as, you know, where water level regulation control points are, certainly, Debbie falls into that category, but there may be others of you that maybe today was the first day you learned that there are, you know, points where water levels are controlled.

And I certainly fell into that category until I had this job, so I'll go ahead and start off with, you know, kind of an overview of what Debbie just gave, but a little more detail about where some of those control points are on the Great Lakes.

This slide here, just summarizing some of the key missions that the Corps has on the guidelines. I'd really just summarize that all into saying that the Corps is the U.S. lead for international water level regulation on the Great Lakes, supporting the International Joint Commission, and then, you know, pretty much all of our other tasks get wrapped up into supporting that, whether that's forecasting water levels on the Great Lakes, monitoring conditions, understanding how the system's changing over time.

Ultimately, that's, you know, kind of wraps up into our mission to support the IJC.

So I'll walk you through this map, very similar to what Debbie walked through, but she gave you, kind of, the profile version of it, but I think this will help highlight where some of the control points are on the Great Lakes, where we have control, where we don't have control.

So if you start at the very northern edge of the basin, you see Long Lac and Ogoki Diversions, that's really the true inflow to Lake Superior, you know, if you want to call it that. Water is diverted into the Great Lakes Basin that otherwise would have flown northward into the Hudson Bay.

It's one of two points where water is diverted in and out of the Great Lakes. So those at the north, I just highlighted, also, the Lake

Michigan Diversion in Chicago is the other diversion point. Their water is actually diverted out of the Great Lakes Basin, that wouldn't have otherwise made its way out.

One thing I like to highlight in the table, in the upper right though, are that these diversions are very small, especially when you compare it to the other, you know, kind of the major flows, you know, between the lakes and the inputs to the lakes, and it's also important to note there's actually more water diverted into the basin through the Long Lac and the Ogoki Diversion than is diverted out through Chicago.

So if you kind of work your way through Lake Superior water, you know, kind of the key inputs to Lake Superior, really, are just Mother Nature. You know, the water just comes from runoff in the lakes or from the basin around the lake, rain that falls on the lake's surface, and that evaporation that evaporates off of Lake Superior, that's really what controls the, you know, kind of major inflow and outflow to Lake Superior.

But when you work your way eastward over to where we have the Lake Superior Control Works called out, that's the true outflow point then for Lake Superior. That's the Saint Marys River, that's where the Soo Locks are, so through a series of the Soo Locks, gated structures, hydropower plants, we have the ability there to control the outflow from Lake Superior.

And so that's kind of the first true control point here in the system. There's an international board established to make decisions on how much outflow should be released. The Corps, again, has the U.S. lead role with that board. I'll talk a little bit more about that on some of my next slides.

But then as you work your way down through the system, you kind of go down the Saint Marys River, which eventually dumps into Lake Huron. You'll hear me talk, as when I'm talking water levels, about Lakes Michigan and Huron, we refer to those two lakes as one body when we're talking about water levels, just because of the connection between the Straits of Mackinac, that's the connection between the upper and lower peninsula of Michigan.

You know, it's a very large connecting point there, so the two lakes really do rise and fall, pretty much, as one body of water from a water level point of view.

So again, that was, you know, the Saint Marys River is the main inflow to Michigan and Huron. Again, those lakes are driven by the same natural components as Lake Superior, and that Debbie highlighted in, kind of, you know, the overall water balance.

The main outflow from there is at the southern edge of Lake Huron, and that's the Saint Clair River. You can see that there at the southern edge. Water flows down through the Saint Clair River into Lake Saint Clair, and ultimately, down the Detroit River before dumping into Lake Erie.

It's important to note at that connecting channel point, there are no control structures. This is just a free-flowing channel, so the only influence we have on Michigan and Huron levels is through our regulation of Lake Superior and, you know, the inflow there. We can't control the outflow from those two lakes.

Water then makes its way -- you know, you work your way eastward across Lake Erie, you come to the Niagara River, again, Debbie highlighted Niagara Falls along the Niagara River. There is an international control board established for the Niagara River, but this board doesn't actually make regulation decisions to control the level of Lake Erie.

Again, as Debbie highlighted, not all of the water flowing down the Niagara goes over Niagara Falls. A lot of it goes through the hydropower facilities, but there's certain treaty minimums that have to be met for the amount of water that goes over the Falls, so it's the board's job to make sure that those flows are being met, they're being monitored, you know, decisions are being made about how much water can be used for hydropower, so that's the role of that control board.

You then kind of work your way eastward through Lake Ontario. Lake Ontario is the other truly, you know, kind of regulated lake on the system. It's outflow is controlled there along the Saint Lawrence. You see the Lake

Ontario Control Work arrow down by Cornwall. Again, there are hydropower facilities there.

There's an international control board on Lake Ontario that's making decisions about how much flow can be allowed to pass through those structures. So again, that's kind of the overview of where the control points are.

So we certainly have, you know, some control over Superior water levels, a little bit over Michigan and Huron, a little bit over Ontario, but still, you know, when you're dealing with lakes this large, you know, Mother Nature is still going to do what Mother Nature does, and that will ultimately drive the direction of the water levels for all the Great Lakes.

I'll briefly highlight here, the structure of how this happens. So again, you know, obviously, the Great Lakes are just one of many international boundary waters between U.S. and Canada, so this, you know, again, highlights that fact here on this map. And it's the International Joint Commission that's responsible for managing, you know, those watersheds, preventing/resolving disputes between the two countries on those watersheds, but the IJC itself is relatively small.

It's three U.S. Commissioners, three Canadian Commissioners, a handful of staff in various offices, but most of the actual work is done through control boards that represent those various watersheds that I showed on that map. And there are three of them on the Great Lakes, I, you know, briefly discussed them in that last map.

There's the International Lake Superior Board of Control, the International Niagara Board of Control, and the Saint Lawrence River Board of Control, you know, that deals with Ontario.

So I'll give a little bit of the details of the regulation here. I won't get into all the nuances of what goes into regulating Lake Superior, but long story short, there is, you know, a binational board of control, Environment and Climate Change Canada leads the Canadian side, Army Corps of Engineers leads the U.S. side, and this board is making regulation decisions every month about what the outflow

should be coming out of Lake Superior.

You have the image there in the right side shows all the various, you know, pathways for flow through -- that's an aerial view of Sault St. Marie and the Soo Locks there. As you can see, kind of, the various ways that we allow outflow to leave Lake Superior.

But long story short is, we're trying to keep Lake Superior's level and Michigan and Huron's level as close to their long-term average levels as possible. There's other, you know, nuances as far as environmental concerns and certainly, other stakeholder, you know, hydropower. There's, kind of, nuances that go into our regulation decisions, but kind of that guiding principle is, really trying to keep those two lakes, you know, as close to their long-term average as we possibly can.

I don't know if I need to say much more about the Niagara Board of Control. You know, I've kind of highlighted here again that the level isn't so controlled. You know, they're not controlling outflows from Lake Erie. It's really just making sure that the treaty minimums are being met over the Falls.

And I will say, with all these control boards, you know, the makeup is the same where, you know, the Army Corps of Engineers is the U.S. lead and Environment and Climate Change Canada leads the Canadian side.

Saint Lawrence River Board of Control for Lake Ontario, similar theory as Lake Superior, that the range of levels are compressed on Lake Ontario, but there's also downstream concerns, you know, that factor into the regulation, especially as you get down the Saint Lawrence River to the Port of Montreal. And again, you know, there's a set regulation plan being implemented, flows are being controlled through the hydropower facilities down the Saint Lawrence.

So that's the whirlwind overview of the regulation side of things, but obviously, there's a lot more that goes into trying to regulate those lakes than just pushing buttons on, kind of, the computer-programmed plans. We need to be able to understand how the basin is changing over time, we need to be able to

forecast what water levels are going to do over time, and that's kind of the real challenge, then, that the Corps has in being able to regulate, you know, in the best way possible.

And I guess this was where I'll kind of start transitioning into the data needs and data uses here. And one of the key gaps, and that Debbie kind of hinted at is just, if you're going to understand the water balance of the Great Lakes, you know, you need to understand how much water is falling on top of the lake's surface.

There's ways that you can model that, but, you know, it's very hard to actually measure that. We don't have points where we can measure directly how much water is raining in the middle of the lake at any given point, and so trying to do a better job of actually measuring over-the-lake precipitation, trying to do a better job measuring evaporation off the lake's surface.

That's the other, you know, dominant hydrologic output of water from the Great Lakes. You know, NOAA has been taking a good lead on trying to install eddy covariance meters to help us actually measure those fluxes and translate that into evaporation. That's been starting to fill a major gap of measurements that we didn't have until recently.

But again, it's very important for us to be able to collect that data, actually understand how much water is evaporating off the lake's surface. Also then, runoff into the lakes from the watershed is another one of those areas where we have limited data and if we're going to really be able to study how these different inputs are changing over time, we need to be able to measure them accurately enough that we can make conclusions about, are we going to see -- you know, are we seeing precipitation over the lake's surface change over time, are we seeing more evaporation or less evaporation than we have?

So again, that kind of all wraps into the challenges of understanding how the Great Lakes are changing and being able to work that into regulation plans and being able to recognize some of these trends of climate change, and again, be able to adapt that through our

regulation.

As one of the key foundational datasets, you know, it's kind of an obvious one, but I just wanted to stress the importance. It's just understanding the actual levels of the lakes themselves, so we rely heavily on what we call lake-wide average levels.

So when we say, you know, Lake Superior's level is X, we're talking about a lake-wide average, not just a single measure point value along the lake. And this map that I have here shows all those gauges that go into our current networks that we use to determine those lake-wide average levels. You can see it's a network of Canadian gauges and U.S. gauges.

You know, the U.S. gauges are NOAA gauges. And again, I just wanted to highlight, these are extremely important to our ability to actually perform our regulation. You know, basically, the current inputs, you know, as we're kind of feeding inputs into our regulation plan are, what's the upstream water level, you know, what's the downstream lake level and what's the upstream lake level?

And without those, we can't perform our regulation. And the actual network of gauges to use is kind of the specified consistent network and it's important -- you know, I've shown, in the bottom graphic, our current period of record that we have coordinated, lake-wide average levels back to 1918, and, you know, again, I wanted to highlight, you know, we have this long period of record of levels.

And that's really foundational to our understanding of the Great Lakes. Anything that we want to do, if we want to understand, do we see cycles, you know, between highs and lows over time? Do we see, you know, trends and differences between one lake versus another? Are we seeing a net lowering of levels or raising?

You know, we can't answer any of that unless we have this long-term foundational dataset that we have here. So, you know, I talked about two of the graphics.

The third, I just showed a report that we generate from my office out of Detroit with the Army Corps. So, you know, while we're the agency that'll actually take the individual gauge

data, use the gauge pairing logic that we have, come up with what that average lake level is, and then report that for use for the boards of control, you know, and for the public to track.

So I also wanted to talk water levels, not just from the lake point of view, but also along those connecting channels of the Great Lakes. So those are extremely important for us to be monitoring as well. You know, I just quickly pulled this screenshot from NOAA CO-OPS website of some of the various gauges along the connecting channels.

And I wanted to highlight over, you know, on your left side of your screen, you know, where I have the Detroit/Saint Clair corridor, you know, that's, again, a naturally-evolving channel that changes over time, and it's important for us to understand how that channel's changing.

You know, if we're seeing increased scouring in that river, we're going to see more flow over time releasing out of Michigan and Huron. We'll see in that lowering of those levels. We need to understand that so that if, you know, we're going to see lower levels, maybe we can adapt regulation strategies to account for that.

And one of the key areas for us to recognize that is just tacking the water levels at these gauge points along the connecting channel. This is part of our operational duties. We monitor for conveyance changes in that channel, we use NOAA gauges to kind of develop relationships between various points along the channel, where if you follow those relationships and water levels over time, you can tell if maybe you're starting to see, you know, a divergence in those relationships, or a change, which would indicate that there might be, you know, geometry changes in that reach of the river.

So again, that's, you know, kind of key foundational data to our understanding of those channels. And then I'd also highlight over on the Niagara River, again, on that eastern edge of Lake Erie, the importance of those, you know, for us to be able to track the flow going over the Falls and the flow on the river, we've developed relationships between the stage at

those gauge locations with what the outflow would be, you know, by going out with our boats and taking repeated discharge measurements.

And so we rely heavily on those gauges, you know, to be able to use, along with those relationships, to know what the flow is over the Falls and what the flow is through the river.

So again, water levels, you know, on the lakes and the connecting channels are obviously very key foundational datasets for us to do our mission.

As Debbie said, you know, we're dealing, still, with, you know, glacial isostatic adjustment. This rebound of the Earth's crust after the glaciers receded. So that's also very important to us. You know, here on the lakes, from a datum point of view, much of the Corps' mission, you know, whether it's dredging harbors, designing structures, understanding the water levels to regulate them, we need to understand how these levels are changing relative to, you know, the datum of the lake.

And that datum changes, then, over time as we're seeing this rebound, so tracking that, understanding -- you know, actually measuring, you know, the velocities of the different areas around the Great Lakes, and being able to translate that data into appropriate datums is, again, I keep -- I'm overusing the word foundational, but again, it's one of these key datasets that lets us then do the rest of our job, to have, you know, kind of key, appropriate, well-updated datums on the Great Lakes.

So transitioning a little bit here, you know, so I work for the Corps of Engineers with my day job, and my other duties as assigned, I'm the U.S. lead for the coordinating committee. It's better than saying Coordinating Committee of Great Lakes Basic Hydraulic and Hydrologic Data. We struggle with an acronym that actually makes sense for this group. I'll just keep saying the coordinating committee.

But this group is, it's a group made up of all the U.S. and Canadian federal agencies on the Great Lakes that have a role with, you know, performing the regulation duties, but also, all the data that goes into managing the water

levels, the flows, in the Great Lakes.

So, you know, obviously, that's going to be the Corps, Environment and Climate Change Canada, the GS, we work closely with GLERL, you know, NOAA CO-OPS, forecasting centers, you know, Natural Resources Canada. I don't have all the logos up here, but it's a comprehensive group.

This group was established over 50 years ago, so it's been a longstanding ad hoc group. You know, it's not like a formalized IJC board with funding, this is just all the agencies on the Great Lakes recognizing the importance of coming together and making sure that we're coordinating our data.

And, you know, obviously you can tell from the name of the coordinating committee that that's kind of the key mission, is that we're coming together and that we're coordinating what data we're using and the methods we're using for our water level regulation activity on the Great Lakes.

So you have these, kind of, singular bodies of water that are split down the middle with an international boundary, and you don't want to have one side of the border releasing their water level forecast that says, we think it's going to do this, and then the U.S. releases one that's similar, but it's slightly different, for the exact same body of water.

It just makes more sense for us to come together and agree on, you know, water level forecasts, we agree that when we're making regulation decisions we don't have Canadian staff using a different network of gauges to develop a lake-wide average that's slightly different than the U.S. side, you know, so we come together and make sure that we're all using those same datasets.

And in the past it's really been focused on water levels and flows, but as we've gotten more sophisticated monitoring for some of the other hydrologic variables, we've come together to discuss how do we coordinate things like precipitation, evaporation, certainly, from a water level point of view, water budget point of view, how do we come together and coordinate those values and make sure that we all understand, you know, again, that we're using

consistent data and how that drives, kind of, this water balance of the Great Lakes.

All right. My last couple slides here, just transitioning a little bit into this sediment and dredging topic. Josh probably gave you an overview of this yesterday, but, you know, the water management, obviously, isn't all the Corps does. You know, 140-odd federal harbors on the Great Lakes that we operate and maintain.

And again, just highlighting the importance of datums to that mission. You know, the Corps is authorized to dredge, you know, a certain amount beneath low water datum, and, you know, again, as we see glacial isostatic adjustment happening, as we see this rebounding and the datums change, if we aren't updating our datums, we may or may not be providing, you know, the depth that we should be providing, you know, at various harbors around the Great Lakes.

So anyway, that's kind of a vital mission of the Corps. And again, highlighting the importance of making sure we have good datum so that the Corps can do that mission as well. I think with that, that is all I have, so maybe we have time for a couple of quick questions, like Debbie said, before we transition?

MEMBER KELLY: John, absent control and regulation, is there a sense overall, if just left to pure nature, are the Great Lakes rising or falling, and what's the projection on that?

MR. ALLIS: Yes, that's a tough question. There isn't a clear trend right now of rising or falling, so the water levels have been fluctuating between extremes. You know, we're just coming off record lows from three years ago on Michigan and Huron. They've rebounded back above average, but we're still seeing a cycling of levels between kind of a natural range.

Looking forward, the climate change projections aren't real clear that they would go one direction or the other, but that we will continue to see further extremes, you know, that we'll see more extreme highs and more extreme lows than we've seen, but maybe not a clear trend in staying one direction of the other.

MEMBER BRIGHAM: Lawson Brigham. It's just to extend what Mr. Kelly asked about climate change and is it safe to say that the serving

network for the size of the hydrological basin surrounding the Great Lakes is not up to the task of giving you the kind of information that's necessary to trying to correlate in the future, climate change and warming with freshwater?

MR. ALLIS: That's exactly it. I mean, the modeling that you need to be able to resolve some of these questions of, will we see more over-lake precipitation, or less runoff, or more evaporation, you know, the modeling, I think, still has a long way to go for us to be able to answer those kinds of questions.

MS. LEE: Joyce?

VICE CHAIR MILLER: Yes. Just a curiosity question, how often do you need to survey and/or dredge in those connecting channels?

MR. ALLIS: That's good question. A little outside of my world, but I believe there's, especially on the Saint Clair and Detroit River, I think there's annual removal going on, of some sort, of various portions of the channel. So not to deepen it beyond the authorized depth, but again, to, you know, deepen those areas where there's been infill.

MS. LEE: If I could comment on that, if I may, one of the challenges that we had during the Upper Lakes Study, which was a $15 million study between Canada and the U.S. to try to explain why Lake Huron was falling relative to Lake Erie's water levels, that difference was changing over time. We did not have complete hydrographic surveys of the entire river.

And so while we recognized that that channel had changed at some point within, like, a 10 to 15-year timespan, we couldn't tell you when, we couldn't tell you exactly where, or exactly why. It was showing up in the lake levels, but because we did not have detailed routine hydrographic surveys to monitor that channel, we haven't been able to answer that question.

MR. ALLIS: Good point.

MS. LEE: And, David?

MEMBER MAUNE: How do you envision the international Great Lakes datum being -- I'm sorry. This didn't turn on. Okay. How do you envision the international Great Lakes datum

being impacted by the new gravimetric datum in 2022?

MR. ALLIS: I don't know. I'm not an expert in datums, so certainly, you know, I guess I just stress that same point that, we need the most accurate representation of, you know, the true datum on the Great Lakes. And certainly, from our point of view, low water datum, you know, and making sure that that's accurately representing, kind of, this lowest water level that we would expect and that we use to benchmark our, you know, kind of, operations off of.

It's critical to make sure that that represents reality. How the nuance is going to change from the old one, it's outside of my expertise.

MS. BROHL: Thank you so much. Just a quick question. And perhaps this is both for John and for NOAA, are there other regional versions of your national hydrologic data groups elsewhere in the country? How does the information that you gather feed into a national observational network or historical data records?

MR. ALLIS: Yes, I don't know if that's more of a -- so from a Corps point of view, what we do on the Great Lakes is very regional, and the data we're collecting feeds more of, you know, our regional mission on the Great Lakes and doesn't tie-in as well to the, kind of, national Corps picture, but certainly from a NOAA point of view, so the things that we care about and we're trying -- you know, as far as extending, you know, gridded precipitation estimates to cover the Great Lakes, you know, we keep pushing for that to be part of, you know, NOAA's comprehensive dataset and that these aren't regional initiatives that, you know, NOAA, as an agency, is just implementing their processes, but doing it over the entire Great Lakes Basin, and not cutting things at the U.S. and Canadian border.

So we do push to have those be, you know, broader, you know, headquarters-level products.

MS. LEE: Okay. We have time to take one last question before we'll move on to Tom Crane.

MS. MERSFELDER-LEWIS: So, Deb, I have

a comment from a webinar participant who is Robin Russell-Trinko from the Passenger Vessel Association and a private owner of a ferry, and she says, "Does the Corps monitor lake temperatures and/or invasives? I have heard that Lake Superior is warming."

MR. ALLIS: The Corps doesn't. You know, I know NOAA/GLERL does a fair amount of tracking of the temperatures of the Great Lakes. But, yes, so not the Corps, but there are others that do.

MEMBER SAADE: Ed Saade, I have a quick easy one for you. If you go back a century, or two, or three, when you show plus or minus 1-foot of the lake levels, is that how it's been for centuries or is that relatively new?

MR. ALLIS: So it kind of varies by lake, but I'll use, maybe, Lakes Michigan and Huron as an example, so the historical range of water levels, at least over the last 100 years, is about a 6-foot range, you know, so that gives you a sense of scale of, kind of, between the record low that we've experienced to the record highs, about a 6-foot range.

And if you look back every decade or so, you know, water levels do tend to fluctuate, you know, pretty much within that whole range.

MEMBER SAADE: So man's intervention in the last 100 years isn't that much of a driving force for what the level of the lakes are.

MR. ALLIS: Certainly not Michigan and Huron. If you look at Lake Superior and Ontario though, you know, and I don't know the exact numbers to put it, you know, to give you a sense of scale, but certainly the range of those levels. Like, Lake Superior's range, I think, is maybe about 4-feet, on Ontario, I'm not sure if it's -- 6 to 8, okay, but certainly on Superior and Ontario, you know, you're taking feet off of that range and compressing into a, you know, levels that stay closer to average.

MS. LEE: Okay. One last question then we'll need to move on in the interest of time to reserve time for some more discussion.

MR. CONNER: Yes, I'm Dave Conner with NOAA's geodetic survey, and as to the question about the Great Lakes datum, there will be a new

IGLD datum. We plan to call it IGLD 2020 and it will be developed in concert with the datums that were talked about earlier.

So it will be a new datum, it'll be related to the overall plan for the North American datum, but it will be developed in conjunction with Canada, special for the Great Lakes once again, and we have not yet determined exactly what the differences in elevation will be. That's still in the works.

MR. ALLIS: And Dave is one of our vertical control experts on the coordinating committee, so thanks for helping out, Dave.

MR. CONNER: Thank you.

MS. LEE: Okay. Thank you, everybody. Those were great questions. Let's go next to Tom Crane from the Great Lakes Commission. And he's going to talk to us about more on sedimentation issues and more of the commission's role and how they've used hydrographic services.

MR. CRANE: Thank you. So thank you for inviting me, Debbie, and Debbie cornered me at a meeting that we held at GLERL a couple months ago. We hold an annual Great Lakes sedimentation workshop. GLERL has hosted it the last few years and so she asked me if I would join the panel, and I said yes, and then my family and I promptly left for a three-and-half-week trip to Africa.

And Lynne was trying to get a hold of me because there was a series of deadlines for getting talk titles together, and so I was back in the office one day and I had to prepare a talk title. And so I did, but just full disclosure, my talk is not going to fully address all the issues in the title here, and I'm specifically not going to be spending a lot of time on sedimentation, although I will try to touch on it.

And actually, one of the things I wanted to mention was this, I found the panels and the talks to be very supportive and connected to one another, and I think that's great, and it's testimony to the work of the organizers who have put these panels together. Debbie and John have already given half of my talk, which is why I can take my time doing this.

But also, the maritime navigation

panel yesterday was also very connected to what we're going to do, so I guess I better dive in here in the interest of time. And what I really want to talk about, and I have two main thematic things that I really want to hit home. One is the importance of partnerships in the Great Lakes, and I think you've already heard that, but I really want to stress that because partnerships is the way that everybody does business in the Great Lakes and I'm going to point that out through a series of projects and initiatives here.

The other thing that's really important is how important NOAA's data and services are to those partnerships and collaborative efforts, and so I'm hoping that I've kind of weaved that into my talk here, but just -- and also, I really appreciate meeting many of you over dinner last night.

And as I was talking to you, I realized there's probably a little bit of a need for a Great Lakes 101, so my first couple of slides is going to do that. Just to give you a backdrop for the region, so we have a complex region and the governing structure is mature, but there are a lot of different parts to it, so we have two federal governments, we have eight states, we have the two provinces of Ontario and Quebec, we have three commissions, so I work for the Great Lakes Commission and I will describe that here on the next slide, John already talked about the IJC, and so I don't need to do that, except to say that the IJC has been around for a long time.

The IJC was formed under the Boundary Waters Treaty of 1909. So in 1909, Canada and the U.S. entered into the Boundary Waters Treaty, the IJC was formed, so they have more than 100 years under their belt in terms of managing the boundary waters of the two countries, and then there's a third commission, the Great Lakes Fishery Commission.

Great Lakes Fishery Commission and the Great Lakes Commission were formed in the same year, although we're different types of commissions. The Great Lakes Fishery Commission is also a treaty commission between the U.S. and Canada, and the Great Lakes Fishery Commission

was established to have a commission between the two countries to manage the fisheries of the Great Lakes with two things, one, to manage the native fish stocks.

At the time, the whitefish and the lake trout populations had been declining over a matter of decades and there was a real concern about managing those fish stocks, and then also sea lamprey control. Okay. So sea lamprey is an invasive species that came into the system, I think, way back around 1930s or so, which was the primary reason why the fish stocks were suffering so much, and so the Great Lakes Fishery Commission manages the sea lamprey control program with the two governments.

We also have First Nations and Tribal Organizations and we have numerous binational and regional non-governmental organizations that actually have a role in shaping the Great Lakes region because we have a lot of business and industry associations, like Lake Carriers Association, for instance.

We have groups like the Council for Great Lakes Industries, which kind of represents a lot of the industrial partners in the region, and we actually have a group that's very active that represents the cities' -- the regions' mayors, Great Lakes and Saint Lawrence Cities Initiative.

So the take-home point here is there's a lot going on in the Great Lakes with regard to organizational interaction and governance. Okay. So just real quickly on the Great Lakes Commission. We are an interstate compact agency, so we are a commission of the states.

We were formed by the eight Great Lakes states back in 1955. Compact is a mechanism that allows states to come together on issues of common interest, so the Great Lakes states got together back in 1955, established the compact, the compact was ratified by the United States Congress in 1968, so we are recognized in both state and federal law.

You can see our members there, all eight Great Lakes states. We work with Ontario and Quebec as associate members. In fact, one of the reasons why the ratification of the compact took as long as it did was, there was a lot of

discussion and debate over whether or not the Canadian provinces could be full members of a compact.

And the answer at the time was no, and so they are not full members of the commission, but we work with them as associate members. So we represent the interests of the Great Lakes states and provinces. These are our core service and program priorities.

Okay. So we are currently in the early stages of updating our strategic plan. So this is actually our old, and still current, strategic plan. And the take-home point here is, one, the outside circle shows some of the issue areas that we work with on behalf of our members and the inside circle shows the areas that, we call them our core service areas.

And the two that I think are the ones that I just want to spend a moment on are information integration and reporting, so we do some research. We're not a science organization, but we research, collect, organize, and make assessable data and information about the Great Lakes that is relevant to our members and to others in the Great Lakes region.

And decision makers rely on data, and the key there is a lot of this data and information is coming from agencies like NOAA, to support planning, resource management, and other activities.

And then the facilitation and consensus building, and someone asked that question of me over dinner last night in terms of building consensus between our members. And as you can imagine, we have eight states that are all different, they all have their own views of things, and one of our main roles is to try to build consensus on issues surrounding the Great Lakes with our members.

So we convene and lead multi-stakeholder forums, projects and activities on issues and ideas of importance to our members, we provide forums on emerging issues and ideas that are identified where leading research is presented, in other words, NOAA plays a big role in that, conflicting views are shared and debated and consensus built around potential solution.

The other take-home point on this

diagram here is the fact that if you look at NOAA's services, they're very consistent with this. In other words, NOAA does work in almost all of these outer rings here, and I think that's one of the things that I wanted to also hit on.

So getting back to this importance of partnerships. The Great Lakes Commission has what we call an observer program where we have organizations that are actually appointed to be part of our commission, they attend meetings, they provide comments to our commissioners, they report on things that they're doing, so you can see that NOAA is represented by both GLERL, the Office of Coastal Research Management, and Sea Grant.

And I'm not going to go through the other lists of that, just to show you, though, that it's a wide range of interest groups. And I pulled from the website the GLERL partnership statement, and I read that because you can do that yourself, but again, the take-home point here is just to show you that the partnerships between the two organizations is very similar.

So real quickly, I'm going to go through this, because I know I'm going to run out of time here shortly, these are some examples of regional collaboration in the Great Lakes and Saint Lawrence River Basin.

And they were picked, not for any particular reason, except to showcase and highlight ways that NOAA interacts with and supports a lot of these regional working groups. I'm not going to talk about the GLRI, because that's Jackie's job here in a couple of minutes, just to say, however, that the GLRI has been a tremendous benefit to the region in terms of bringing resources into the Great Lakes for restoration activities, but also as an opportunity to coordinate those activities, what, I think it's 11 federal agencies, and it's been a real success story.

And Jackie will talk to you about that here in a moment. Great Lakes Water Quality Agreement, Debbie mentioned that, so we have a formal water quality agreement between the U.S. and Canada, so it was first entered into in 1972 and updated in '78, '87, and most recently in 2012.

I'd love to spend 30 minutes talking about the water quality agreement, but in the interest of time, all I want to say here is, the newest agreement formed annex working groups that are very important, and the take-home point there is that NOAA is supporting and very involved with many of those annex working groups, specifically the Annex 4, nutrients group, and I think Annex 10 is the science group, and I know NOAA's playing a big role in supporting that effort, and again, Jackie may hit on some of those as well.

Great Lakes Observing System. I think probably most of you know about the Great Lakes Observing System, but it's one of 11 regional associations of the Integrated Ocean Observing System, and which is a partnership between federal, regional, academic, and private sector parties to work and provide data and tools and forecast to improve safety, enhance the economy, and protect the environment.

And NOAA data services and product support the GLOS data portal in some very significant ways in terms of point observations, like wind, waves, water temperature, water levels, air temperature, those types of things. Satellite observations, so including weather, information on harmful algal blooms, dissolved organic carbon, suspended minerals, water surface temperature, those types of things, and then model forecasting, so currents, ice thickness, water levels, waves, et cetera.

Great Lakes Commission was involved with GLOS in its early years. We helped kind of form GLOS and stand it up as its own 501(c)(3). We're a little less involved with it now. We are still a member of GLOS, but I just wanted to point that out as, this is one of the examples here.

This one here is really this, this is kind of a summary slide and the take-home message is this, NOAA's research services and products are really important to the Great Lakes. And I lifted that statement off of the GLERL website. And on the right, I just kind of summarize or highlighted, kind of, main areas where those services and supports are really influencing, in a good way, what's going on on the Great Lakes.

So the observing system, ecosystem

dynamics, and ecological monitoring, and the water level monitoring network are all really important to the work that we do.

So I'm going to kind of whip through these real quickly because the shepherd hook will have to come out here in a minute. These are just some additional examples of collaboration. Harmful Algal Blooms Collaborative, and it's actually a collaboratory, which, I don't even know is a word, and that's kind of the, maybe, one of the most overused words in the Great Lakes now, is collaborative, collaboratory.

But in any event, it's a partnership that involves NOAA, it's co-led by the Great Lakes Commission and USGS, and it's bringing science-based information into a very important issue to our region, so harmful algal blooms is a huge issue in western Lake Erie, it's a huge issue in other regions of the basin, including Saginaw Bay and Green Bay.

And this Harmful Algal Blooms Collaborative is really an opportunity to bring that scientific expertise into an important issue. One of the things I'm not sure you're aware of, and I wish Mike Piskur was still here, because his organization, Conference of Great Lakes and Saint Lawrence Governors and Premiers actually manages this, but we have binding water management agreements in the Great Lakes.

So this is agreements that have been entered into by the states and provinces to manage the water resources with regard to new and increased water withdrawals, diversions, and consumptive uses. So in other words, it's a commitment on the states and provinces to develop better water management programs for supplying the region's needs for water.

And that's public water supply, industrial supply, power generation, irrigation, all of those things. These agreements were worked on for several years, they were finalized in 2005, and became official in 2008, and there's a second compact here, so there's a water resources compact that is also recognizable state and federal law.

And it basically, these agreements detail how the states and provinces are going to manage their water. And NOAA's involvement in

this, again, is significant, one, in terms of working with the states and provinces on the collaborative science strategy, so in other words, helping the states and provinces better understand water resources and their need to manage them more efficiently.

And then the assessment of cumulative impacts. The agreement in the compact call for periodic assessments of cumulative impacts. And the last full cumulative impact assessment was, covered the years 2006 through 2010. I think it was issued in 2012. The next cumulative impact assessment is going to start next year after the release of the 2015 annual water use data, so it's going to cover the period from 2011 to 2015.

And NOAA's information on the water balance is critical and key to the success of doing those cumulative impacts assessment.

We've talked about dredging and I'm going to have to go through this real quickly, but our involvement with dredging, is a collaborative team effort with regard to the Great Lakes Dredging Team. It's been around now for 20 years. It's a partnership between Federal Government, the states, and private partners. We have ports and industry partners that work with us, and the team priorities are sustainable dredge material management, beneficial use of dredge material, looking at the science surrounding open water placement, environmental windows, which is really important in the Great Lakes in terms of dredge material management disposal and when you have active fish spawning.

And we're starting, as a priority, to work on using science to better inform policy and management with regard to dredge material management decisions. Take-home point here is this, NOAA's data and services are important to this team, but NOAA hasn't been particularly active with it.

And so one of my goals is to try to get NOAA more engaged as a full member of the dredging team. All right. So these last few things here before I wrap up, because I did want to point out a few areas that are important to us.

We heard in the discussion this morning, the Office of Preparedness and Response,

I don't know if I have the right word there, but we interact with NOAA, that office, on various things, and one of the things that really important for the Great Lakes is the update of the Environmental Sensitivity Index Maps.

They were last updated in the early '90s. Oftentimes, or at least it appears, that sometimes these updates are triggered by certain events, like, that last update followed the Exxon-Valdez incident in Prince William Sound, Alaska.

We've had two big oil spills in the Great Lakes over the last five years, the Enbridge Pipeline spill in Marshall, Michigan in 2010, the Lac-Megantic train derailment and explosion in Quebec, and the Great Lakes states and provinces are very interested in all of the increased movement of crude oil to and through the Great Lakes region, and so we would love to see these ESIs updated.

The other thing is, we wanted to just put a plug in for in-basin presence of navigation team staff in the Great Lakes. You heard a little bit about this yesterday. There was a nav team member that was located in the Lake Michigan field office who retired three years ago. The navigation program is managed out of Silver Spring, and from everything that I've heard, that management is fine and has been going along great.

The encouragement would be this, however, and I can share this just from personal experience, oftentimes having an in-basin presence can be really helpful in terms of establishing relationships, attending meetings, getting information out on services and product, so we would encourage NOAA to consider reestablishing an in-basin presence for the navigation team.

And then we've heard about the real-time flow meters. I think it was specifically for the Maumee, but there are two other flow meters that are really important, one in the Cuyahoga River and one in the Saint Clair River. Funding for those has run out, and I know NOAA is kind of working to see if there's some partnership opportunities with local partners, but the encouragement there is, this is really

important to the Great Lakes so we want to see those current meters -- make sure that funding for those current meters continues.

Just real quickly, a few final thoughts, one is, the Great Lakes Restoration Initiative, I think has been a tremendous success on a lot of different levels, one of which is, I think it has brought much needed added attention to the importance of the Great Lakes, but the encouragement here is, keep up the good work.

In other words, sometimes, historically, the Great Lakes have felt like the orphan stepchild, and we want to make sure that the Federal Government and federal agencies, like NOAA, give the Great Lakes the same attention as they give the ocean coast. Make sure GLRI funding does not supplant base funding for supporting programs.

Now, the GLRI funding, when it was established, it was very clear that those were funds designed to come in and enhance and accelerate restoration activities in the Great Lakes, but we periodically run into problems with those funds being used to supplant base funding for other programs, and we just want to say, we need to make sure that base funding for really important programs for the Great Lakes are not supplanted and continue at a level to make sure all that good work is occurring.

Make sure the programs are coordinated across different branches of NOAA. There's not a specific recommendation here except as someone who doesn't work for NOAA, you have a lot of different offices, programs, and it's hard to keep all of it clear, and to understand who's doing what.

And the way that I normally do it is, I meet people and I develop a contact in an office that I can use to help me navigate through that maze of different programs and offices, but I just want to say as an encouragement, make sure all your programs are connected.

And then specifically, and this is just an observation on my part, I think NOAA really needs to consider to have a stronger near shore program in the Great Lakes. I think the GLRI has accelerated that, so I think you want to build upon the successes of the GLRI and

coordinate near-shore activities with end costs.

But my observation is this, that the near-shore work seems to be project-based, which is fine, but I think it would be really great if the near shore program was connected and strategic. And I'm a little bit over, but I'll stop, and, Debbie, if there is time and people have one or two questions, I'd be happy to answer them.

MS. LEE: Yes, we have a few minutes for questions. So, thank you, Tom. Those were all great points and it's great to get that feedback from a partner who can provide an objective view on the services that we provide. Yes.

MR. ARMSTRONG: A quick question. I just wonder if you could elaborate a little more on what you mean by a near shore program, what kind of things, so we could think about those.

MR. CRANE: Jackie said she's going to get into that, so I will allow her to cover that on my behalf, just to save time.

MR. ASLASKEN: One comment on the ESI mapping. Mike Aslasken with NGS. So we, through ARRA funding proposal, we updated all, at least the border shorelines of the Great Lakes, that are now available, and that baseline, that lake level shoreline, is the basis for the ESI maps.

So typically, the Office of Response and Restoration, who's the folks that actually are responsible for the ESI mapping, will take the shoreline that we provide and then classify it to the sensitivity index, which is a much simpler classification scheme.

So the short message is that the shoreline is there, it just needs to be updated with that classification type. In addition, I don't know if you were here yesterday, but we are flying oblique imagery of the Great Lakes at this point, which is another basis of them doing the classification, which will be publicly available once we're complete.

Just to be aware that that data is coming from NGS.

MR. CRANE: One of the things I failed to mention, because I was kind of whipping through these things really quickly, is coordination with Canada. So Canada has been

doing some risk assessments and then has been doing a, kind of an ESI light, if you will. And we think it's important that we coordinate those activities so that the approach is consistent and uniform as much as it's able to be between the two countries, because there's so much crude oil moving through the basin, and some of that's going through Canada, some's coming through the U.S., and to have that coverage on both sides would be really great.

MR. ASLASKEN: I'll take that back to those folks. Mr. Holst is a little bit of an expert there too.

RADM SMITH: Shep Smith. Could you elaborate a little more on the value of the flow, you called them, sort of, flow meters in the rivers, which made me think that you were using them hydrodynamically and not for navigation, which, people may ask.

MR. CRANE: Well, they are obviously supportive for navigation. We periodically attach our name to efforts, the commission-named efforts, to make sure that the stream gauge network program nationwide is being supported, that we don't lose stream gauge networks. We have lost a lot of stream and sediment gauges in the Great Lakes over the last 20 or 30 years.

So it was really a -- I actually lifted that out of your report, your activities report, and I just brought it forward as something to say, these types of things are really important to support a whole variety of work, not just navigation, but I think it also can support some of the near-shore work that Jackie will be talking about here in a moment.

MS. LEE: And if I might expand upon it, and maybe John would want to mention it, but for example, the one in the Saint Clair River, it gives us the only measurement that we have of real-time flows in that connecting channel. The only other way we can do it is either model the flows or calculate them based on longstanding relationships between the water level gauges, so it's very unique that it be able to provide us -- it also provides year-round information, which is very rare in the Great Lakes.

Once the ice cover is on, we usually lose a lot of our observational capacity, yet,

ice has a profound effect on the amount of water that flows through that channel. In the Maumee River, it is looked at being helpful to look at the nutrient loading. It's not measuring nutrients directly, it's measuring the flows, and those impulse of flows carry the majority of the nutrients during high flow periods, so it's giving us a better handle of that flow volume coming into the lake.

And for the Cuyahoga, similar reasons as well, so looking at nutrient loading, amongst other things.

CHAIR HANSON: Deborah, if I could, appreciate the endorsement of NOAA's services and the products we provide, and we feel the same way and would appreciate also, as you guys have a chance to articulate your message outside these walls, but also in your other collaborations, that you continue to endorse those products because it doesn't always get the visibility that it should have. People just think these things happen.

I noticed the Coastal States Organization on your list of collaborative and they're meeting in Milwaukee in a couple weeks, and that's a group that is trying to tackle some of these coastal issues, on a national basis, not just regional, so it's good for them to hear that type of discussion as well.

So I just had a -- there was a comment, but more of a question next is, in a collaborative, where do you see the academics, the universities, on the Great Lakes? Who's most interested in coastal issues?

MR. CRANE: We work with so many universities. And Debbie probably even works with more universities than I do. I mean, certainly, the land-grant universities from all of the states are very heavily involved in this work. I mean, so we've got the Water Center over at the University of Michigan, we've got the Institute for Water Research at Michigan State, we've got a lot of things going on at the Ohio State University, University of Wisconsin, Purdue, and all of those universities are plugged into these efforts in meaningful ways.

I think the non-point harmful algal blooms issue is a huge issue for us regionally,

and a lot of the universities are really playing a key role in terms of doing research and really assisting and supporting in those efforts.

CHAIR HANSON: Maybe just a final comment, because we also, I'm with Great Lakes Dredge and Dock Company, and we participate in the Great Lakes dredging team as well, and appreciate your efforts there to look at beneficial use of dredge materials, and using science to make decisions, not lawyers.

MR. CRANE: Right.

CHAIR HANSON: Thank you.

MEMBER BRIGHAM: Just a quick comment. Lawson Brigham. I think there's an underutilized resource in the wintertime for observations, and it's the Coast Guard icebreaker fleet. I was Captain of one of the smaller icebreakers, and even in the late '70s and early '80s, we took measurements and it did some thickness measurements.

So I think in the preparation for this meeting in one of our discussions, the issue came up about enhancing wintertime observations using the, maybe the commercial world, but also the Coast Guard icebreaker fleet.

MS. LEE: Not seeing any more questions, we'll move on to Jackie's presentation. Jackie plays a very important role in the Great Lakes National Program Office, as she helps administer one of the focus areas of the Great Lakes Restoration Initiative. And so, Jackie, I'll go ahead and let you tell us more about that.

MR. ALLIS: Sure. So I just want to thank all of you for inviting us here. Thanks to Debbie for allowing EPA to come in and kind of give you our thoughts on the use of NOAA's hydrographic services and how they play, not only into EPA data collection and programs, but also, how they're used by the Great Lakes Restoration Initiative.

So I've broken my presentation up into three pieces. The first, I thought it would be great to give you guys an overview of the Great Lakes Restoration Initiative, not everybody's familiar with it, so I'll give a little bit of background on that.

And then I'll delve into a little bit

of EPA's use of NOAA's hydrographic services and future data needs. And then I'll closeout more with this other NOAA data services that support GLRI implementation, and that'll get more into the HAB forecasting work and things maybe not necessarily directly associated with the hydrographic services.

So background on GLRI, Great Lakes Restoration Initiative is by no doubt, the largest investment in the Great Lakes in at least two decades. As of fiscal year 16, approximately $2 billion has been allocated to targeting and addressing the most urgent issues and problems facing the Great Lakes.

In FY15, a task force of 11 federal agencies, and you can see their logos here, they released Action Plan II, which, like Action Plan I, was designed to be results and action-oriented. It targets the most significant issues in the Great Lakes and it strives to demonstrate measurable results.

So with that Action Plan II, there were very specific measures of progress that were developed to track all the actions that are implemented under Action Plan II. GLRI has also been a catalyst for unprecedented federal agency coordination through both the interagency task force and the regional working group, which are led by EPA.

Under Action Plan I, resources helped to fund the cleanup actions required to delist five Great Lakes areas of concern and to formally delist the Presque Isle Bay Area of Concern.

Resources were also used to double the acreage of conservation practices in watersheds where phosphorous runoff is contributing to these harmful algal blooms. And GLRI has provided assistance for over 2000 projects to support Great Lakes restoration.

During fiscal years 15 through 19, these federal agencies are continuing to accelerate --- to use GLRI resources to strategically target the biggest threats to the Great Lakes and to accelerate the progress towards addressing these threats. And how is that done? Well, it's by combining the GLRI resources with agency-based budgets, and by using these resources to implement protection and

restoration.

As Tom pointed out, I think it's important to note, I know that yesterday there were some funding discussions, it's really important to note that GLRI funds are specifically meant to supplement agency-based budgets and not to supplant them, so we don't want to lose programs thinking that the funding may come in from another area.

So as you can see here, GLRI was funded at the $300 million level in both FY15 and 16, and the president's FY17 budget has it set for $250 million. Discussions, since we're about halfway through Action Plan II, are now underway for the development and drafting of Action Plan III.

So as you can see here, there are five focus areas that are addressed in Action Plan II. As I mentioned, it summarizes the actions that federal agencies plan to implement during the FY15 through 19 time period. Many of these issues that will be taken up will take decades to resolve. It's not instantaneous results.

The actions will build on restoration and protection work that was carried out in Action Plan I, with a major focus on cleaning up Great Lakes areas of concern, preventing and controlling invasive species, reducing nutrient runoff that contributes to harmful and nuisance algal blooms, restoring habitat to protect native species, and in Action Plan II, we've also incorporated a science-based adaptive management framework.

That's being used to prioritize problems and then select projects to address these problems. It also is meant to assess the effectiveness of some of the GLRI projects. So not everything that we're implementing may have the results that we were hoping to achieve, so this adaptive management is helping us to refocus. If we notice something isn't working well, we're refocusing and readdressing.

Since its creation GLRI has helped to supplement some of NOAA's hydrographic services work, which has led to getting these projects and products operationalized much quicker than had the funding not been available.

So to address the question of what

NOAA products, data, and services are valued by EPA and how are they beneficial, you'll hear me talk about bathymetry a lot. EPA and other federal agencies use NOAA's bathymetry data for countless efforts. We use the data for not only for navigational information and for charting courses, but it's used for determining specific sampling depths and determining sample locations.

So in the Great Lakes, different depths have different environmental components. I'll use the diporeia Ring of Fire in Lake Superior for an example for you. So diporeia, if you're not aware, is an anthropod, it's a major food source in the Great Lakes for lake whitefish and many prey species.

We know from several research studies that there are elevated diporeia densities within the 30 to 125-meter range within Lake Superior. So that habitat, which is named the Ring of Fire, it occurs as a band around the lake in that depth frame.

Now, that depth frame covers only a quarter of the bottom of Lake Superior, but it, in fact, encompasses 2/3 of the population of diporeia within Lake Superior, so small area, huge fish spawning habitat, fish, you know, anything that has to deal with the food web are migrating to that area.

So knowing this type of information and having the bathymetry data available helps us to monitor within specific environments. So the National Coastal Condition Assessment, which is a national coastal monitoring program, recently conducted a survey in the Great Lakes.

They used NOAA bathymetry data to follow the 30-meter contour and to select the near-shore frame that they wanted to focus on, so their station requirements were that it couldn't be more than 30 meters deep and 5 kilometers from the shoreline, so using that data, they were able to draw stations randomly.

You'll see here, that blue line represents the near-shore area of Lake Erie, but that was done for all five lakes to select the 225 base sampling stations that were assessed.

So moving on to address the question of what other products and data would we like NOAA to approve and/or offer. This is just a

list of needs that have been identified by EPA and some of the other GLRI collaborators. I'll go into each of these pieces in the following slides, but in general, the list included up-to-date bathymetry data, or at the very least, for Lake Superior, which hasn't been updated for several decades, and bottom mapping for both the near-shore and open waters.

And getting to your question, that bottom mapping is going to help with habitat classification, and I'll get more into that later.

So getting into the bathymetry data needs, more up-to-date information is needed, and as is always the case when you're collecting new data, if a study is done, getting those results out quickly would be most beneficial, though we realize that's not always the case.

The bathymetry data that comes out should be available to the public or at the very least, to other agencies, and it should be available in a variety of formats, whether it's ArcMap layers, Google Earth layers, something that can be pulled into mapping on mobile devices, just various formats for download.

And as Debbie and John mentioned, there should also be -- there's also a need to account for lake level fluctuations. The Great Lakes are impacted by lake level changes, whether they're seasonal changes, or crustal movement, you know, the data would be beneficial, not only for the commercial and recreational boaters, but for the environmental research community as well.

It was mentioned yesterday that GLRI resources were allocated to assist in updating the Great Lakes datums, and we're looking forward to seeing that data come out in the future and help to support it in the future.

Having up-to-date bathymetric information would also feed into helping with the Annex 2 of the Great Lakes Water Quality Agreement. So this annex specifically focuses on the near shore, and in particular, the Nearshore Framework, so updated bathymetry would aide in sample design, and ultimately, lead into habitat classification for this framework.

So while bathymetry is important, you know, there's a widely acknowledged need for

information about the lake bottom. This data would provide information on fish spawning, feeding and habitat selection, as well as information on invasive species and where they are, invasive species such as Dreissenid mussels and other mussel types.

The Great Lakes Water Quality Agreement and the Great Lakes Fishery Convention of 1955 are two international agreements that highlight the needs for bottom mapping. And then we get into Annex 7 of the Water Quality Agreement, which is the Habitat and Species Annex.

They have a goal to -- or they have a need to jointly support an integrated remote sensing delivery system, and this system would help to address the habitat assessment over the entire basin. You know, it's been recognized that the current approach that all of us have been using of, you know, certain projects funded here and there, sporadic projects, or inadequate projects, they've led to an incomplete understanding of the drivers that are degrading the lake bottom and the habitat systems within it.

So things like sonar for deepwater habitats, and getting into Admiral Smith's thing of seamless topography and LIDAR for coastal areas and wetland environments would be most beneficial. And I guess I should say that I was surprised during your presentation yesterday, there was a map that showed all of the coastal work that had been done, and it was like 1200 miles, nautical miles, or something, but there were no dots within the Great Lakes Basin, so I think that's important to note.

So what are we doing to address these? To address the needs, NOAA and USGS have developed a Great Lakes Bottom Mapping Workgroup. And their aim is to harmonize the collection, and processing, and sharing of all of the data. The workgroup currently has 70 registered participants from both sides of the border, and they're currently undertaking a data and technology inventory, and basically, developing a needs assessment, a prioritized list of needs, and they hope to have that needs list available in the spring of 2017 as a white paper.

So this bottom mapping workgroup is also identifying and addressing some of the challenges that scientists faced in generating maps of bottom substrate. For example, if you can't collect it via the air, it's probably because it's too turbid, but if it's too turbid, then the chances are it's probably too shallow to get a ship in there.

So other options would be these smaller boats that can use single-beam systems to sweep the near shore, or maybe utilizing that ice cover that you mentioned. If the ice cover is thick enough, maybe we can use some type of ground penetrating LIDAR.

And then there's a different method, this TDEM method, which is time domain electromagnetic method, and this can be used for bathymetry and substrate classification. So it's being used for mapping coastline and near-shore waters, and it's especially useful in mapping those areas where they're extremely turbid environments, where some of those conventional methods may not provide very meaningful data.

And since it's an airborne method, it's a little bit quicker than if you were to use a ship to get in and out.

So how will we get all of this done? Obviously, if we decide to go this route, there's a diversity of vessels that are needed to generate the necessary data. The NOAA GLERL fleet can be much more adept at doing Great Lakes work, especially if they're going to be the ones that are looked to to generate the data.

And if, in fact, they choose to go that route, an investment in the regional fleet may be needed. And also, we should be looking at the roles, the complementary roles, of AUVs when putting these plans together. As of right now, they're really only used to groundtruth remote sensing platforms.

And I'll finish up by just talking about the other part of my presentation, and other being the other types of data services that support GLRI implementation. It was mentioned yesterday that GLRI funds help to supplement some of the HAB forecasting work.

This forecasting will continue to be crucial because non-point source pollution and

runoff is not going away anytime soon, so keeping that system up and running is crucial. NOAA's also worked with the National Weather Service to develop a runoff risk advisory tool.

So this tool, it works to track storm systems and farmers can then go into it and it will advise them on when they should and shouldn't apply fertilizers to their lands based on the runoff risks.

And NOAA's playing a central role in Annex 4, which is the nutrients annex of the Water Quality Agreement, so this annex is looking particularly at harmful algal blooms. They're providing estimates on HAB biomass as well as toxin levels and triggers for toxin production within those cyanobacteria blooms.

So these triggers will be critical when we start to develop the phosphorous targets for the Great Lakes moving forward, and I think Debbie will touch a little bit more on that in her afternoon speech.

So underlying all of these are the circulation models. These models give us information on where the HABs are going to move once they're formed and where they're ultimately going to end up. And, you know, then we can plan, you know, town of so-and-so, don't draw in your water on these days, using that forecasting system and the circulation models, because the HAB is going to be present near your water intake and it can contaminate your drinking water.

So all of these things provide additional planning efforts and prevention efforts.

And with that, I will close. I have some people to thank. Brandon is in the back, back there, he really helped out with some of the information for the bottom mapping. I think he's one of the co-leads on the workgroup. And I can leave my contact information up. And with that, I'll take questions.

MS. LEE: All right. Thank you, Jackie. So I think you can see a lot of the complexity in the Great Lakes, both from a physical and an ecosystem perspective. So, Joyce, did you have a question?

VICE CHAIR MILLER: Yes, I wanted to know, is there a, and this is either to NOAA or

to you, is the Navigation Manager or an other OCS person a part of this bottom mapping group?

MS. ADAMS: I will turn to Brandon. Sorry. Putting you on the spot.

MR. KRUMWIEDE: So just for a little clarification on the Great Lakes Bottom Mapping Workgroup, it actually spawned out of work within Annex 7, habitat and species. Pete Esselman from USGS and myself, we keep hearing the need, we need more data on the bottom, we need more data.

And what's interesting is, with my line of work, you know, I get to talk to Tom and hear what the needs are, or I get to hear from other parts of NOAA, this workgroup is actually completely ad hoc, organic in nature, completely volunteer-based in that regard, but what's interesting is, so as Jackie pointed to, we're looking at the technology and standards.

This is binational in nature, so the Canadians, of course, have their standards that they look at with different mapping aspects. We're also looking at the data holdings. Canadians are obviously very interested in what we have as far as JALBTCX, and they're looking to do that on their side of the border, getting calls from that.

So really, this is kind of open to anybody and everybody that has an interest, and so actually, we're getting ready to send out a list to see who's interested in these different subgroups. So technology and standards, data holdings, and then the data user needs as well, so hopefully that answered the question there.

MS. LEE: All right. Thank you. I see another question over here.

MEMBER SAADE: So I was going to mention that there has been hydrographic LIDAR data collected on the Canadian side for the CHC. I'm not sure if, from listening to all of you talk, it doesn't sound like you're aware of that or you've been shared with that data. I was curious how that sharing process goes and then I was thinking, with Ashley Chappell's big map of, certainly, of North America and Alaska included, it might be a nice way to show where the data has been collected as a cooperative nature between the two countries.

MS. LEE: Yes, I think that's a very

good point. That's one of the things we do struggle with in the Great Lakes is, how do we integrate all of the data that is available; how do we make everyone aware of that data? It seems to be one of the challenges that perennially comes up because we have so many agencies and so many different jurisdictions involved in the data collection. It's a big challenge for us. Brandon?

MR. KRUMWIEDE: I just wanted to thank you very much, Ashley. With this workgroup, we are actually coordinating with Ashley quite a bit. I think I've been on more emails and phone calls with Ashley in the last year based on this interest in the workgroup. So actually, what we're using is the needs that we hear, that's going to get fed into SeaSketch and the IOCM, IWG-OCM as well.

We've got interests from USGS with the CoNED development to the point where we're looking at potentially having a summit here in the Great Lakes with John Brock and Jeffrey Danielson with that effort as well.

MS. LEE: Well, if there aren't any more -- are there more questions specific for Jackie? Oh, okay, I see another over here.

MEMBER BRIGHAM: Not necessarily for Jackie, but just for the, maybe, our letter, just a recommendation that, from what I heard, and everyone, that more observations for modeling for climate change, and when I hear 6-foot is the range for the lakes, I mean, that directly impacts on navigation services and navigation itself, so maybe we can work something into our letter about observations.

I'm sure a point about that would get great attention by our administrator.

MS. LEE: Okay. Well, we still have 15 minutes remaining in this session to have a general discussion, so if anybody would like to initiate that discussion, I guess, to start that off, I would say, I think it's really important to recognize that NOAA's data is foundational to supporting two, at least two, major agreements between Canada and the United States, that being the 1909 Boundary Waters Treaty, and then also the Great Lakes Water Quality Agreement.

Those two ensure that we have

peaceable relations with Canada, that we share the resources equitably between the two countries, and so I really can't understate, I think, the value of the data that NOAA provides to ensuring that we care for this binational resource. And so if we can help focus, if this committee can help focus on that, we would be very appreciative of it in this region.

RADM SMITH: I just wanted to follow-up on the bathymetry. You made a great case for a bunch of different applications for bathymetry and then threw out a bunch of different technologies that could potentially be useful for them. And one of the key things to match the technology against the requirement is understanding what the resolution requirement is for the bathymetry and the accuracy.

And so I don't know whether you have -- before we get into the weeds on the different technologies, can you give us any better sort of flavor for what types of resolutions?

MS. ADAMS: So I think this is getting into habitat and substrate mapping, so I would say that the finer resolution, the better. I'm not the bathymetry expert. I just know that the people that I had spoken to said it was like fine-scale high-resolution bathymetry, is the terms that they used.

Now, realizing that, when you get into those shallow environments, you may not necessarily get extremely high resolution, especially if you're using something like a single-beam versus multi-beam, but we don't have anything to work off of right now, so I think, going forward, any additional information or data that can be provided would be useful.

MEMBER PERKINS: Scott Perkins. So Jackie, I think the slide showed FY17 has $250 million for the GLRI. So is there a spending plan? Is there a public-facing spending plan of how those funds get allocated out in what services?

MS. ADAMS: Yes. So our budgeting process is a two-year process. So we've already budgeted, or planned, for fiscal year 19. So what happens is, we go through this budgeting process with the regional working group members, so all those agencies meet at a table, talk about

the different measures for the different focus areas, so there's a set budget for each focus area already, so it's not like it's a flexible --

MEMBER PERKINS: Yes, I'm just -- could any of that funding be used to fund NOAA performing those hydrographic surveys of the requested resolution?

MS. ADAMS: Not to fund -- so we have to remember that it's meant to supplement and not supplant, so it would have to be combined with NOAA funding, not replacing the NOAA-based funding that would normally go into funding a NOAA hydrographic service program.

MS. LEE: And one of the key things is, the money has to be tied to a restoration initiative. So we did recently have some funding that we were able to get to support the IGLD update, but the money that we got for the summer gauges had to be co-located with areas of concern, because Lee made the case that it was important to have accurate shoreline -- sorry, accurate shoreline information to be able to plan a sustainable restoration for an area of concern.

MEMBER PERKINS: Yes, I'm just looking, it sounds like there's an opportunity for coordination and cooperation with the work that Mr. Aslasken's group is doing on the shoreline in Michigan, with the oblique imagery, with the aerial imagery, you know, how would we liaise, how would we orchestrate that?

MS. ADAMS: So we'd have to tie it back to, I touched on those measures of progress, so there are targets that are set for specific focus areas. Like, for example, I lead the Focus Area 3, which is the near-shore focus area, and I do a lot of work with nutrients and harmful algal blooms.

Now, funding the HAB forecast system didn't necessarily meet one of our numerical targets of pounds of phosphorous reduced or gallons of water that were removed, but we realized that the HAB forecasting system is feeding us information on nutrients, so we were able to tie it into that focus area using that information.

So it's all about how you craft the wording, I guess. We would have to make sure that we could tie it directly to a measure.

MEMBER PERKINS: So I think this circles back to the comment we heard earlier about not having a NOAA person in the basin, I believe was the terminology. Is it the opinion of the panel, invited panel speakers, not this panel, that that is limiting this cooperation and collaboration opportunity?

MS. LEE: Well, let me explain just a little bit more about how NOAA manages the competition for funding for GLRI money. I sit as NOAA's representative on the regional working group and we have a Great Lakes collaboration team that has representatives on it from all of the line offices. And Jennifer Day, who's here in the back of our room, is our regional coordinator, and so she acts as the program manager.

And so when EPA commences planning for a particular fiscal year, we, at NOAA, put out a call to our collaboration team, to representatives at NOAA, and ask for proposals, and those proposals come back into the team, and they have to be related to a particular focus area, and we then rack and stack those proposals, and we put them forward to the focus areas where they then get discussed and decided whether they're going to be funded or not within the context of that focus area.

So in that sense, we do have representation of all elements at the table. The question is, is, are we really seeing the whole universe of projects that we could possibly put forward, and then, are those projects also considered competitive from EPA's perspective in terms of the action plan and the measures in the action plan?

So for example, it took us quite some time to get everybody to understand the importance of the IGLD update and why it mattered to restoration, and that took about a two-year, three-year, process for us to socialize that and get it to move up into the competitive realm.

And I do believe we have Heather Stewart, Brandon, do you know, she put in a near-shore mapping proposal for FY18. Yes, do you want to talk about that one?

MR. KRUMWIEDE: So, yes, for FY18, we did put forward a topobathy LIDAR -- well,

actually, I take that back, a bathymetric data collection in shallow water environments. The two environments were the St. Louis River Estuary and Chequamegon Bay. These two areas, on previous topobathy LIDAR collects, failed to provide any returns because of the turbidity and tannin staining within the water in these environments.

The reason we actually put forward the St. Louis River, a couple reasons, one, it's a NOAA Habitat Blueprint Area, and two, the previous hydrographic survey was completed, I believe, in 1942, in the upper part of the estuary. The only parts that have been updated with hydrographic information are Army Corps of Engineers dredge surveys within the channels.

Interesting thing though, is, there have been two large floods, 1976, I believe, and the largest one, of course, that made news was 2012, the Duluth floods there, and it completely changed the upper part of that estuary, to the point now where we've got, of course, as mentioned, the Lake Superior near is up there as well, they run around in a flat-bottom boat, because they're fear is hitting deadheads, sediment bars, things like that, and it's a continuously shifting environment as well.

Live coastal bluff erosion, so you have sediment entering into the system, so we have put forward a proposal in FY18. I will say that Jackie pointed out, there's two different action plans, Action Plan I and Action Plan II. Under Action Plan I, we did receive funding for a 2010 topobathy LIDAR collect that actually completed a lot of the north shore of Minnesota and parts of Wisconsin that filled in a gap that was not previously covered under the JALBTCX missions.

The other thing, for folks to be aware, talking with JALBTCX, they are planning to come back in FY18 and 19 to do recollects up here for the NCMP, the National Coastal Mapping Program. So our office does put forward proposals, but as Debbie has stated, you know, it has to meet those measures of progress under the Action Plan II, and that can be kind of challenging to get pushed forward through there.

MS. LEE: Right. And so that

particular FY18 project didn't make the cut line for funding at the $250 million mark, but if a similar trend happens and Congress appropriates more than what the president's budget provides, so last year they did a $50-million plus-up, then we can bring these other projects to the table that didn't make the cut to be reconsidered. It's still not a guarantee they'll be funded, but they can come forward for reconsideration.

So this really prompted a thought on my part and I guess a question I'd like to put to all of you, if I may, and that is, how, as a region, can we better communicate our needs to you? Because it occurs to me that we are not formally communicating our needs and maybe on an annual, or a semi-annual, or a five-year basis, to help inform needs across agencies.

And so I'd just be curious, your thoughts, on how we might do that better as agencies within the Great Lakes.

CHAIR HANSON: Well, I can speak a little bit from the navigation side because I think you've got some really good advocates who've made some progress. I work closely with them on issues like Harbor Maintenance Trust Fund and federal funding, so I think you're getting some visibility there.

I think the RSM component of what the Corps is doing around the country is probably the best thing they're doing, combining authorizations and taking advantage of the money that's available, overcoming hurdles and boundaries of agencies in local levels. We don't need to go into the federal standard discussion here in Cleveland, but that's not the only port in the country that that's an issue.

And when you start talking about beneficial use of dredge material and regional sediment management, we find you don't address many dredging issues. You're addressing regulatory issues, you're addressing efficiency issues, scattered funding, again, the authorization hurdles, and you're looking to get efficiency over the overall program.

So I think the more you connect as a system, we talked about that a lot yesterday with Mike's group, that's where your strength is. It's also a weakness in other parts of the

country when governors look at things regionally, agencies look at things regionally, you have a lot more stroke than you do looking at it individually.

MR. ASLASKN: I would also recommend that, you know, with our state advisors from the geodetic side and our Navigation Managers on the coast survey that, engaging them more regularly. Sorry I had to step out. We got a little bit of a storm in Tampa and we got one of LIDARs and that one LIDAR was sitting on minus a foot elevation, so we need to get that to higher ground.

Anyway, but a lot of what I've heard, or what I've heard in the hallway from Admiral Debow is that, you know, the foundation data you guys rely on. So, you know, I heard about ESI maps, I heard about imagery and shoreline, you know, I think that's maybe engaging more regularly with us because that foundation data is used in lots of different applications beyond charting.

And that might be more telling as far as how you engage and give us requirements of when and where we need to be doing surveying, because a lot of what we rely on, what I rely on as far as when we task our contractors, or when we task our aircraft, or people to do mapping in the Great Lakes, are feedbacks we get from a charting interest.

We'll fly the sanctuaries, we'll fly the nears as partners of organizations, but, you know, these other applications are sometimes we don't hear about, so I think engaging directly with the navigation community from your part would be helpful.

MR. BOLEDOVICH: I know some of your organizations, you know, make annual, or more than that, pilgrimages to the D.C. area as well, and of course, their offices are welcome to meet and catch up on some things if we can setup a side meeting with some of the folks. I know the Great Lakes has a big initiative every spring that they come in and we'd be happy to help coordinate across the ocean service and in NOAA, for that matter, just for a check-in meeting of what's up. What are your hot topics for the year and that kind of thing, just to touch base.

That's a good time of year to maybe do that on an annual basis as a check-in. But of course, Heather is our contact. She works for the ocean service, for OCM, and as Mike mentioned, the geodetic advisors, and Tom, the Nav Manager, point taken, a permanent Nav Manager in the region. We heard that message.

But I think we have some opportunities in the region already, and then through the regional coordinator, through Jen as well, it's an opportunity, I think, but just to check-in and say hello, not a big conference or anything, but when you come to town, make a point to reach out. You can start at Russell's office, where I work, in the AA, we can kind of filter it down with as much notice as you provide, the more notice, the better, that you're coming, would be great.

MR. CRANE: So that was a great comment. So we come to Washington for a week, or four days, every late February, early March, we often set up agency visits, we do a lot of Congressional office visits also, and we often invite agency administrators to come in and talk to our commissioners, and that sort of thing.

But I think that's a great comment. It doesn't have to be super formal, but just to make that connection. Like, for instance, every March, I'm always in Silver Spring meeting with Sea Grant director because we have a partnership with Sea Grant where we have a fellowship program, and so I'm always there for a couple hours, and it would be an easy thing to do to kind of arrange some additional visits and to check in and talk about priorities for the region, and that sort of thing.

MR. BOLEDOVICH: Yes, just to emphasize, I know the commissioners are kind of in another -- it doesn't have to be with the -- it can be with staff, just to check-in if there's some issues, so we don't have to get -- I know their schedules when they come to town are pretty jammed up.

MR. CRANE: Right.

MR. BOLEDOVICH: Happy to meet, even meet for coffee or something in the morning.

MR. CRANE: Yes, that'd be great.

MR. BOLEDOVICH: All right. Awesome.

MEMBER HALL: One of the requests

though, if I heard it right from Deborah, was how to better interact with HSRP. We obviously will not be at headquarters in February or March for your conference. And so I think that, I don't know how that would work, but I know that we only get to certain regions every few years. And I don't know if there would be some way for headquarters to help us get inputs from them every year so that we're not just thinking about Great Lakes in 2016 and not in 2017, or 2018, or 2019.

And so I don't know if that's something that we can start asking for, where we just have a one-pager on each of the regions and where things stand hydrographics services-wise, or, you know, I don't want to give a complete answer to it, but I think that that's kind of what I was hearing, how do you interact with HSRP where we can be providing, you know, recommendations that aren't, every year, just towards that one area that we were in and revisit some of these things, help influence our issue papers as we move forward and continue that process.

So I just wanted to put that out there. Thanks.

VICE CHAIR MILLER: I think, as we've said before, a lot of these issues, we see repeatedly in other areas, you know, the Army Corps/NOAA interdata compatibility, and so forth, is something that we see in almost every region, every time, and we report back on it, so it may not be specific to your region, but we are trying to improve the overall service to the communities by our letters and our one-page reports.

MS. LEE: Thank you very much. Okay. I think, Lynne, we are at the end of our time, is that correct? And everybody's probably getting hungry and ready for lunch, so, Admiral, I'll turn the floor back over to you and thank you very much for allowing us to come before you and for the attention you've given us for two solid hours, so thank you.

CHAIR HANSON: Thank you, and to the panelists for engaging as well. It's nice to be allowed the dialog and not just presentations, so thanks for giving us the time to do that. Also on our agenda now we have our opportunity for

public comment to the HSRP. I know we have at least two comments and although I'm not sure the first is really public comment. Helen Brohl, are you considered the public?

MS. BROHL: Thank you very much. If it's okay, I wanted to just take a moment and provide a little bit of my past experience when I spent ten years as the executive director of the Great Lakes Shipping Association. And just wanted to, really, just provide an observation from that experience, given your conversation about PORTS systems in the Great Lakes, and also, really, Tom Crane's timely mention of water level observations.

So in the late 1990s, there was extreme low water in the Great Lakes. We heard, you know, that there's a historical trend, but water goes up and water goes down in the Great Lakes, and representing vessel operators in the Great Lakes, this is a concern, obviously. You can't always wait for the water to rise because of the wind in order to address your loading capabilities.

And in my particular case, I represented the international vessel operators. Those were those vessels that actually left the Great Lakes through the Saint Lawrence seaway system, which had very restrictive, both draft and dimensional lock restrictions.

So at that moment, in the late '90s, when we had this unusual water level challenge, it was when we recognized that the suite of water level gauges that were managed by NOAA in the Great Lakes had gone under disrepair. It just was the nature of funding and attention to the Great Lakes at that time.

And thanks to the Great Lakes Commission, who came in, remember, there were earmarks back then, something I think some of us may miss, I don't know, but back then there were earmarks. Great Lakes Commission came in with about $250,000, I think you were able to get, secured, I can't remember the fiscal year, to help do some quick repair on major water level gauges.

This was hugely important because in the Great Lakes, and I think you probably got the gist of this, most of all of the river systems

provide in-transit capability for vessels. There is not necessarily a local sponsor.

So even though you have the Port of Detroit, most of those vessels are actually going past the Port of Detroit into the Detroit River, into the Saint Clair, the Saint Marys, it's not as if there is some local sponsor that is taking care of water level observations on the Saint Marys River. It's really an in-transit navigation channel.

So as the representative from the Great Lakes Shipping Association, I took it upon myself to coordinate Great Lakes representatives, including the Great Lakes Commission, to build on what the Great Lakes Commission had done.

So fortunately, because of Senator DeWine, at the time, from Ohio, we got, five years in a row, $2 million, under earmarks, again, that was then, not now, to specifically upgrade those water level gauges. That was how the Great Lakes Water Level Observation System was born. Didn't really exist in that name then.

So we also knew that PORTS systems wasn't really practical. At that time, there was only one PORTS system, it was up at the Soo, we called it PORTS light, I believe, the Great Lakes Commission provided money to the Army Corps of Engineers, or through the Army Corps of Engineers, by which then they helped to co-fund that, because again, there was no really local group at the Soo who could do that.

But I honestly say, we kind of thought amongst ourselves in the shipping association, PORTS was not how we wanted to go in the Great Lakes, because of that lack of local sponsorship, so we really, truly, took the time to invest in a Great Lakes water level observation network. It's not a coincidence that those gauges are updated in almost real time, in six minutes, I guess, which was a huge change from what we had before, which was basically a system in disrepair.

So I'm raising this because I wanted to share with you the history of how that was thought about in terms of vessel operations. So I know you talked a lot about PORTS systems in the Great Lakes, but it was at that time, the shipping industry's interest to really invest in

a Great Lakes Water Level Observation Network at large, rather than to go specifically.

And I will commend NOAA, who, at that time, did extraordinary work with us to put current meters in very critical locations in the Great Lakes, in Toledo, in the Cuyahoga River, to address the mariners' interests for certain spots that were very challenging, vessel operation-wise.

So really, my goal here was just to share a little bit of the history. It peaked my interest in listening to you talk about PORTS in the Great Lakes and also Tom's timely mention of water level observation networks, but just to emphasize what he did, that, at the time, when I was with the shipping association, and I imagine it's still the case, was really a priority interest in the Great Lakes. Thank you very much.

CHAIR HANSON: Thank you. And we're going to hear from you later as well, right? All right. Lynne, you said you had another comment from --

MS. MERSFELDER-LEWIS: So the NOAA liaison to the Office of the Oceanographer of the Navy was in touch with me before his wife had a baby and said that the NOAA and Navy partnership has recently taken steps to become stronger and more efficient. One of the five working group focuses on survey requirements. Both departments are in the process of identifying hydrographic strengths, weaknesses, and opportunities for additional collaboration.

The HSRP will serve as a terrific venue for this exact purpose, with both NOAA and USN representation. Captain Rick Brennan and the Office of Coast Survey will be the POC. Very respectfully, LCDR Jason Mansour, NOAA liaison to the Oceanographer of the Navy.

So you can expect a little bit more Navy participation.

CHAIR HANSON: Okay. Well, I guess we can get a copy of that?

MS. MERSFELDER-LEWIS: Yes. And that will go into the record.

CHAIR HANSON: All right. Thank you. Almost like a hydrographer of the nation, right? Yes, sir.

MEMBER BRIGHAM: Lawson Brigham. I think that this cooperative venture with the Navy came out of our discussions of the Arctic and databases that might be there or not there that could be merged in some sense. I'm sure that's where some of that discussion came from.

CHAIR HANSON: Well, good.

VICE CHAIR MILLER: We've got a few minutes. Do we want to read out the letter?

CHAIR HANSON: Sure. Just as a quick update as well, while we have a couple minutes here, we mentioned the letter of recommendation earlier this morning and a response from the Undersecretary, and we actually did receive that this morning, so we thought it would be fair that we -- do you want to go ahead and read it, Joyce?

VICE CHAIR MILLER: I can.

CHAIR HANSON: Okay. And Joyce will read it out and say thank you.

VICE CHAIR MILLER: "Dear, Mr. Hanson, thank you for your letter providing the Hydrographic Services Review Panel recommendations from the Galveston public meeting and for sending the issue papers that provided further insight into the meeting. The panel clearly invested a great deal of time and thought into its advice on NOAA navigation services programs."

"I congratulate you", this is Bill, "in your new role as Chair, Joyce Miller as her new role as Vice Chair, and the five new members of the HSRP. I rely on NOAA's federal advisory committees to provide forward-looking strategic advice on issues of science and technology. Your leaders in your areas of expertise in collecting offer advise to NOAA that will ensure our navigation data services and products effectively meet the needs of our citizenry."

"In response to the HSRP recommendation on re-capitalizing hydrographic capacity in the NOAA fleet, while we may not directly replace hydrographic vessels one-for-one, your emphasis on maintaining survey capacity is noted. As part of the ongoing fleet re-capitalization efforts, NOAA has initiated an independent review team, IRT, to examine current and future fleet composition."

"The IRT analysis final report is

expected in September of 2016. I will share their recommendations following reviews. You may consider reviewing this analysis at a future HSRP meeting. While the president's current budget does not include any new initiatives for charting geodesy, or related ocean observations, these activities in the U.S. Arctic will continue to be a NOAA priority as we make progress using existing resources."

"I would hope you will take advantage of the opportunity to communicate HSRP priorities to the incoming NOAA leadership team in the coming year, as you will provide valuable continuity between this administration and the next. Sincerely, Kathryn D. Sullivan, PhD."

CHAIR HANSON: All right. Well, thank you, Joyce. Any quick comments on the letter? Obviously, we'll have some time to discuss it later. Okay. Well, again, thank you for that. Before we break for lunch, let me go ahead and repeat that HSRP has a working lunch, so you're not off-duty yet. For all others, it's lunch on your own.

We're going to reconvene at 1:30 back here in this room. And before we go, Gary, go ahead.

(Off the record comment)

CHAIR HANSON: Well, let's take a pause and we'll see you back here at 1:30. Thank you.

(Whereupon, the above-entitled matter went off the record at 12:00 p.m. and resumed at 1:33 p.m.)

CHAIR HANSON: All right. As we adjourn, we would like to -- reconvene, rather, like to just get any thoughts on the last panel discussion, and see if we have any outstanding thoughts that we didn't get on the table before.

I think we've been pretty engaged, so I don't know if there's anything new, but after you've had a chance to think about it over lunch. And while you're thinking, I want to take the opportunity to say thank you to an old friend who's -- going to be his last meeting.

Mr. Magnuson, it's been a pleasure working with you. And I know we'll see each other around at all these things. So I appreciate all your friendship, and help over the

years, and congratulations.

MR. MAGNUSON: Thank you.

CHAIR HANSON: Okay. With that, anybody have any new thoughts on the last panel?

VICE CHAIR MILLER: Well, I would definitely say that bathymetry is an oft expressed need for -- up here, for many, many reasons, not -- probably charting not being the most important of them, but bathymetry is a definite need.

CHAIR HANSON: So if there is another thing that's consistent from all these meetings, besides PORTS, it's that very comment. It's identifying the needs of the nation in terms of bathymetry, and not just having the comments that we need more.

It's actually, for our purposes, talking about how we plan to accomplish those, with the assets available to us, so something we'll be talking about consistently. But I think, at some point, we would like to get where we have some ideas to kick around, and some solutions.

And I've got my back to Larry, so he's over here --

DR. MAYER: It's the story of my life. Yes, bathymetry came up, but as I listened to the presentations, I also heard a great need for backscatter, for bottom mapping, in terms of bottom type. And that goes way beyond bathymetry, but yet goes hand in hand with the systems that we typically deploy.

So I just don't think that should be forgotten. The call for sea floor characterization, or bottom characterization was quite pervasive.

CHAIR HANSON: Lawson, and then Susan, just a heads up, because I'm going to ask you the recreational side of this.

MEMBER BRIGHAM: Small thing. It wasn't -- it was -- and I still didn't understand. The dredging team, the regional dredging team, there was not someone NOAA on that team, or from NOS or the need for someone to be on that dredging team? There was a question about it.

CHAIR HANSON: Sir, do you recall the -- you tried to respond to that one about having

a NOAA person on the Great Lakes dredging team?

MR. LOEPER: Yeah. I'll be getting in touch with them to get on that team, so we've discussed it in the past, but --

CHAIR HANSON: Yeah. I think it's one of those things that when all's they were doing, and I was one of them, whining about lack of money. It was just kind of the same meeting, same conversation, time after time.

But now that they've actually, successfully have started to get more money for dredging in the lakes, they're starting to realize the disposal rate management issues are critical and need to be addressed. And so the team becomes more relevant, more timely, so encourage that participation.

Okay, the recreational boaters have been kind of quiet lately.

MEMBER SHINGLEDECKER: I thought I was -- I spoke up yesterday. I mean, I thought that, to me, it was interesting, this panel was one of the first times that we've had a crossover presentation from EPA, and how they're using some of the services. That's kind of what stood out for me.

And, I mean, obviously it's the connection, first and foremost, I think, with drinking water supplies, where their jurisdiction comes in, and how that is overlapping with the harmful algal bloom modeling.

Certainly, harmful algal blooms impact recreational boating a lot. We're hearing it more from stakeholders in Florida right now than in the Great Lakes. I think Lake Erie, they've come to accept it, more or less.

But for me, that was the biggest issue that came up, in terms of that. I mean, certainly the gaps in funding for the dredging of shallow water harbors, which was mentioned yesterday, is a concern to recreational boating. So that, probably and, you know, the importance of understanding harmful algal blooms certainly impacts recreational boaters.

MEMBER HALL: We've acquired a phone somehow, up here at the table, if -- okay. I've charged a couple of things on Amazon. They'll be arriving at my house, not yours.

(Pause.)

CHAIR HANSON: All right. I'll introduce you, Helen, so -- and that's -- what? Well, thanks for joining us this afternoon. And I saw your names on the agenda. We actually fought for some extra time for you. So thanks. Thanks for being here, and we know you'll have -- you'll generate some conversation. So thanks.

Our first speaker, for those of you who don't know, is Ms. Helen Brohl, executive director, U.S. Committee on the Maritime Transportation, otherwise known as CMTS, and also a former vice chair of the HSRP.

For the benefit of the new members, the CMTS is a cabinet level, interagency committee, chartered and authorized in law, to provide a federal forum to develop plans and strategies to improve the U.S. Marine Transportation System.

Helen, all yours.

MS. BROHL: Thank you so much, Mr. Chairman, Madam Vice Chair, and members of the HSRP. It's a pleasure to be here today. Thank you for the shout-out of having been a vice deputy chair of HSRP. You all hold a place in my heart.

I'm going to brag for one moment, and say that I am the proud co-author of the legislation, back in 2002, with Mary Beth Long from the American Association of Port Authorities, and John Rayfield, who is currently now the majority staff lead for the Coast Guard Subcommittee on the House side.

So -- and that was when John was still in the House Resources Committee, so we've come a long way together. So I'm very proud to have been part of that.

We were very much engaged with a group called the National Maritime Marine Navigation Safety Coalition, and that was how we brought 60 different organizations together to talk about, in many cases, really, NOAA's coastal and mapping programs. So we have a long history with NOAA, and a proud member of the CMTS.

So if I may ask, just by a show of hands, how many members of the committee have actually heard of the Committee on the Marine Transportation System? Oh that's actually pretty great. Okay.

So because there's a couple, and I know Ed doesn't know anything about it, but I'm teasing, Ed and I go back -- know anything about it, I'll just go over it quickly, because I don't know we have a lot of time. I'm going to assume this will put it forward. Hot dog.

Okay, so this is stuff you already know about our coastlines. A lot of navigable waterways in the United States, over 25,000 miles. So those would be waterways that are, include all major federal channels, that are mostly maintained by the Army Corps of Engineers.

This is a number that I see that -- I repeat a number that I talked about earlier. We have the citations for these, in case you want to use them. Lots of passengers, lots of recreational boaters, lots of cruise ship passengers, and as I mentioned earlier, if you look at the international trade in U.S. only, almost 72 percent by weight of trade, and 44.2 percent by value.

And I did forward that citation over, if you'd like to take a look at it. The reason I mention that is that when we, in the past, as a interagency committee, had tried to track that 95 percent number, we could not find an original citation. It was a citation from a citation from a citation.

So on our website, I'll show you the link later, it's really cmts.gov, we have a Marine Transportation System fact sheet. That fact sheet are those facts that we could, through interagency agreements, basically agree upon.

And one of the things we could not agree upon was the number of ports in the United States. So you won't see how many ports we have in the United States. The Coast Guard says there's 300, the Army Corps says there's over 500. Actually, the Corps has a couple of different definitions just within the Army Corps of Engineers.

MARAD has different ones. So that's actually a number. It's all about definition. And fortunately, we anticipate the new Bureau of Transportation Statistics Working Group on port freight statistics should come up with a definition. The question is, can we all agree to it, interagency-wise?

So for those of you who deal in transportation, one of the ways in which we describe the Committee on the Marine Transportation would be the obvious. If you wanted to know, in the federal government, who handled aviation, we'd send you to the Federal Aviation Administration, you know, highways, Highway Administration, rail, Railway Administration.

But if you were to ask me, who in the federal government handles something in -- handles maritime, I'd have to say, well what's your question? Depending on your question is where I'm going to send you.

If you want to know the number of U.S. flights in international trade, I'd send you to the Maritime Administration. If you wanted to know who did charting and mapping, your coastlines, I'd send you to NOAA. If you want to know who regulates the waterways, I'd send you to the Coast Guard. If you want to know who handles dredging, I'd send you to the Army Corps of Engineers.

All of those four agencies are in different departments. When you add to that, all of the other agencies that are engaged in maritime transportation, it looks like this, in a very simple form.

We actually -- when the -- and I'll talk about the committee more specifically in a minute, but one of the things that we did when the committee was put together, was to get a sense of who did what and where in the federal government.

How do you know what you need to do if you're not really sure who does what and where? And this is the simplest version of this matrix that we have. This is more of an educational matrix, because it's divided by departments, not by agencies.

We can get more complex by then subdividing those departments into agencies. That gets you up to about 30 agencies. If you add independent offices and bureaus and White House offices, and interagency committees, like the National Ocean Council, it gets bigger and bigger and bigger.

And if we expand on the programmatic

categories, which is down the left hand column, it gets to be really -- if you want to print it out, it's about this big.

The interesting thing is, each one of those Xs tells you basically the ways in which those agencies are engaged in the Marine Transportation System. It would appear, visually, that there's overlap, but in fact, virtually every one of those Xs is a defined specific role for specific reasons.

So why those agencies may be engaged in that issue area, for the most part, there is very little overlap. And in fact, there's actually a lot of gaps.

The Committee on the Marine Transportation System was created by presidential directive, really to kind of herd all of those federal agencies under an umbrella, so there could be a common vision, and a way to communicate regularly about the Marine Transportation System, because it's complex.

And the -- it started with the -- under President Bush, the U.S. Ocean Action Plan, probably even hard to find online anymore, though I think you can find it via our website, and that was in response to the National Ocean Commissions Report.

In there, it established an inter -- cabinet level interagency committee, interdepartmental committee, for the MTS. That was really the brain child of Secretary Norm Mineta.

For those of you who remember Norm Mineta, he was also a previous Secretary of Commerce, and then Secretary of Transportation. And in 2003, if you've ever heard him speak -- first of all, he's charming. He's 84 years old. He's rocking and rolling it. He's such a great guy.

But he will tell you, if you want to talk about maritime transportation, he will tell you the exact date and time and moment that was, to him, one of the biggest losses of his life, and that was when Coast Guard left the Department of Transportation for a new DHS.

And when Coastguard left DOT, they took a chunk of maritime oversight with them. Because collectively -- and this is not a

pejorative comment in any way, shape or form, but technically speaking, if you take away the DOD money that goes to Department of Transportation, their maritime equities are about a $400 million line item, for a couple of agencies.

Now, certainly they get more than that, to handle a ready reserve fleet that comes from DOD. So I don't want to minimize the value. But DOT, as the agent, the department that is supposed to express and implement a vision for a national transportation system, has very little maritime equities.

So that's why this committee, to Secretary Mineta, was very important. He understood the value of having some oversight. So by charter, back in 2005, and 2004, the Ocean Action Plan, 2005, quickly a charter, signed by cabinet members, and -- which set off the CMTS.

A staff office was set up one year later, in 2006, at the Department of Transportation. That staff office was first staffed by me and Gary Magnuson, who came over from NOAA, and Ms. Pat Mutschler, who was with the Army Corps of Engineers.

Now Gary, unfortunately, as you know, left us to go back to NOAA. And NOAA's very generously replaced him with a woman by the name of Heather Gilbert, who knows the programs, and we're very grateful for that.

And then we're supplemented, as a staff office, with contractors and a NOAA Sea Grant Knauss fellow -- go Sea Grant, and so we do quite well. And I'll explain a little bit more.

But by 2012, John Rayfield and Dave Jansen, over in Coast Guard Subcommittee, said perhaps it was time to establish the CMTS in authorization.

So through a Coast Guard Authorization Act in 2012, the CMTS was established, and basically to do three things, to assess the adequacy of the Marine Transportation System, in a reporting structure.

The first report was due two years ago, where I'm actually in the background trying to finish -- do we need comments from you, Ashley? Do I need to nudge you for that? Probably.

Anyway, trying to finish that MTS

report to Congress, our job is to integrate the different modes of transportation, environmental side, with the Marine Transportation System, and I kind of think, most importantly, to coordinate maritime transportation policy in the federal government.

I didn't say create policy, but coordinate policy, because those policies are supposed to be decided upon the individual agents -- agencies, and then brought together under the umbrella of the CMTS.

Whoops. Wrong way. Okay. Very quickly, by charter, but not by statute, the Secretary of Transportation is the chair, the cabinet-level chair. That's currently Anthony Foxx.

And then we work at a sub-cabinet level more day to day, a coordinating board provides that day to day guidance to the staff office and the interagency teams, for work plans and how we're going to move forward on a vision for the Marine Transportation System.

By statute, the coordinating board rotates yearly, between the Secretaries of Transportation, Homeland Security, Defense, and Commerce. Currently, it is with the Department of Homeland Security, and Secretary Johnson appointed Rear Admiral Paul Thomas, who is Scott's boss, who is the head of prevention policy. Correct? Thank you. I always get it backwards, one or the other.

Anyway, he is currently my board chair, and in many respects, my boss at this time, so I kind of get a new boss every year. However, just previously, he took the place of Department of Commerce's representative to the board, who was chair, Vice Admiral Manson Brown.

And Manson Brown did an extraordinarily great job. And I have to shout out to NOAA, because at very critical times in the origins and establishment of the CMTS, to really truly establish it as a working functional partnership, NOAA stepped up.

Vice Admiral Lautenbacher, in 2007, as our chair, really rallied the forces in an extraordinary way. And then Margaret Spring, who was chief of staff in the first four years of this administration, she spearheaded the

legislation in Congress.

So thank you to NOAA for that, and NOAA's continuing engagement. We really appreciate it.

So we have a staff office at DOT. The Maritime Administration was voluntold to house us, but they've been very gracious hosts. All of the work is really done through staff-level folks, through the agencies. It's not really intended that I am the CMTS and we are the brain child. We really look to this as an agency-led organization.

Just because Congress says, you're all members of this group, doesn't mean anything. You know, benign neglect, you can do a lot of little with benign neglect. And yet, I think it's one of the most high functioning interagency partnerships in the federal government.

I'm clearly prejudiced on that, but as politicals come and go, who say you'll never be able to get anything done with 30 agencies, always leave saying, it's amazing what this committee does.

But it could not be done, frankly, with the incredible talent, folks like Ashley Chappell, and Russ Proctor in the back, and Scott Smith. It just could not be done without that talent. So everything's done through interagency subcommittees.

Whoops. Sorry. Doing it again. Okay. So I'm going to show you the priorities for the last previous year, because we're not going to approve the new work plan until September 21st. But basically, some of these things have stayed the same.

Oh, before I go on, I heard last night -- I think it's kind of cute, and unfortunately, Gary's not here to back me up on this, but last night I understood that trying to make a correlation to the Hall -- Rock and Roll Hall of Fame.

So I will tell you that building a coalition within the CMTS has not been easy. As a matter of fact, it's been challenging. I would say, as we started this, my job really felt like the Almond Brothers song, "Tied to the Whipping Post." I was tied to the whipping post.

However, ten years later, I celebrate

-- there you go, tied to the whipping post. Ten years later, ten years later, I just celebrated ten years -- there you go, in July. That's right. In July, and now I have to say, after all that, it really just feels like a current pop song by Meghan Trainor -- she's not in the hall of fame yet.

But she had a song that was called, "If I was you, I would want to be me too." If I was you, I'd want to be me too. So it tells you, I've got a hell of a good job now. All right. That's the end of my pop references.

Okay. It seemed funnier earlier. All right. Our priorities have been pretty much in these issue areas. We have the monkey on our back that's assessment report to Congress. So if you want more citations on things about the MTS, please just let us know. We're filled with looking at that kind of stuff right now.

The status of that report is that it's in final draft. It should go back out for interagency review. The fact of the matter is, any report to Congress must be approved by O&B through interdepartmental reviews.

Getting interdepartmental reviews is the easy part. It's getting something out of O&B. Whether we'll get it out before the end of the administration, who knows, but we're going to be close. It is a huge priority of Admiral Thomas to get that done.

Secondly, the last strategy of the Marine Transportation System was in 2008, approved by the cabinet-level board. We are certainly overdue to revise it. It was updated in 2013.

At the time, our current chair, in 2013, asked that we table it until the assessment was done, kind of a Catch 22. But we're very close to getting back to it.

So I want to put a point in. To the extent that there are things that are huge priorities out of this federal advisory committee, and there are a lot of other MTS-related federal advisory committees in the federal government.

As a matter of fact, there's 36 of them. That list, we have on our website. We can go down the list. But to the extent that you

have recommendations to your federal sponsor, NOAA, and to the extent that NOAA is comfortable forwarding those for consideration, or thinking about those recommendations when that strategy goes through our interagency reviews, you may want to do that.

We will work through your federal sponsor, of course, but please keep in mind, the timing is very good for some of these things. And I'm sure NOAA listens as they go along, and will look out for your interests. But please keep in mind that we are getting ready to update a national strategy for the Marine Transportation System.

So these are kind of obvious areas in which the CMTS is engaged, because they're important to all you guys. You talked about it already. MTS infrastructure investment, and for us, infrastructure means both hard infrastructure, and informational infrastructure.

That has always been a priority, certainly something that NOAA reminds us about, but across the federal agencies, it is both informational and like hard concrete.

Arctic marine transportation navigation services and technologies, I'm going to talk about that a little bit more, especially because of what you do here. Maritime data, huge issues, our research and development, resilience, energy, veteran's hiring, and really, promoting the value of the Marine Transportation System.

And if I could, I want to say that when we talk about promoting the value of the MTS, cannot tell you enough, right now, in a change of administration, you guys are hugely important. You are a connection between the federal government and the powers that be.

And the next administration, whomever that may be, it's up to all of us to educate and inform those folks on the value of the Marine Transportation System. Don't presume it's an obvious, because it is not.

As a matter of fact, one of the stories that Admiral Thomas told me was when he was briefing Secretary Napolitano about how ports are very different than airports. You know, maritime ports aren't confined, like in an airport.

They're not? No. People can almost come and go through them. They can? It's not like it -- the perception and understanding of how ports work wasn't just something we think they understand.

So we cannot presume those people understand just what that's about. So please keep that in mind as we move forward. We're all in the business of educating and informing on the value of the MTS.

One of the ways that we do that outreach is through federal advisory committees, so thank you for letting me be here today. It's hugely important. It is part of our outreach plan. And as I said, there are 35 other federal advisory committees that deal with maritime transportation.

The closest one to you would be the Navigation Safety, the NAVSAC Committee out of Coast Guard. And in the past, there has been some appropriate communications, because there are FACA rules that you have to go by, so you want to work through your federal sponsor.

But there has been communication to make sure that the things that you're putting forth are really complimentary to the Navigation Safety Committee.

So I just want to mention that because back in the old days, when I was on here, there was that list of most wanted that you put out, which was a really great piece. It was like, here are the top things that are most important to us, boom, boom, boom, boom, boom.

And not only was that shared with NAVSAC, Admiral Lautenbacher brought it to the CMTS and shared that with us, and said, these are things that are important to the HSRP. We'd like to bring them to the attention of our federal partners.

Okay. So very quickly -- and I'm not going to go over all these detailed. I want to spend a little more time on the navigation technology work. Infrastructure investment, want to emphasize that investment, how do we address infrastructure challenges?

People often talk about public/private partnerships as some magic bullet. It is not free money. It is just a financing mechanism.

What we under -- I think you'll kind of understand that, as we try to investigate what the federal government does or doesn't know.

They actually don't know a lot about public/private partnerships. There's a lot of budget people, but not a lot of finance people in the federal government.

Also, we did a legal analysis of public/private partnerships in a handful of maritime agencies, and found that the way in which they are directed, either through regulation or statute, was all different. They all had very different ways in which they can engage in P3s.

So as we talk about learning that process, recognize that every agency does it differently, a little complicating factor.

Also did some investment priority, how do we rank how we would -- if politics wasn't a consideration, and you truly wanted to create a maritime transportation system that really addressed your supply chain challenges and things that you need, how would you do it? Where would you put your money first?

So there has been some interagency consideration on that. What would the tiers be in which you engage, excluding the politics of things, which changes it altogether.

So some of the things that we did, for -- you may find this of interest. It's a very -- so our most popular document. We put together a handbook of federal funding to the MTS.

Now keep in mind, some of that funding wasn't intended for maritime transportation, but it could be used for maritime transportation. Some things like DOT, the TIFIA grants were never thought of for maritime, and there's now -- now there's some of that money going.

It was always a highway-centric. Now it's broader. So there are over 80 programs, federal programs, for those of you who are just amused to run through stuff like. It can be a great idea for ways in which the government has funds, or doesn't have funds.

I did some like, some analysis of benefit/cost ratios, P3 work, and -- so our infrastructure investment map, I'm afraid I've got to take that off. It was on our website. We

were having so many glitches with it, we took it off.

What that was is, was on -- you could toggle through and see what the sources were for funding in the Marine Transportation System. But I'm sorry. We've had a failure on it, and it's not on there right now.

Arctic Marine Transportation System, 2010, Congress directed the CMTS to coordinate transportation policy in the U.S. Arctic for safety and security. We issued, in 2013, an over-arching report on an Arctic MTS.

So if you're not familiar with maritime transportation in the U.S. Arctic, it's kind of a good primer, I think, on how it works, who are the components. Ashley Chappell is a co-lead on that team.

I got to say, a 2013 report did a lot of it, and knocked it out of the park. But it's a great, general, broad way in which we talk about the priority needs to create a very vibrant, safe, secure, maritime -- or MTS in the Arctic.

Also, Congress -- not Congress, sorry. The White House, through the national strategy in the Arctic region, directed DOT, and DOT directed the CMTS, to do three reports in the Arctic. First was a ten-year projection of maritime activity in the U.S. Arctic, available on our website.

The second one was priority investments in the U.S. Arctic, and that is completed, based upon the needs. And the third one we're working on now is the use of P3s in the Arctic, which is challenging, because we're asking Arctic specialists to talk about P3 funding.

But -- so we have people from Treasury who have helped write it. So please don't take this as an offense. But as you can imagine, here's the challenge for finding people who understand finance in the federal government. It's just not innately something we talk about.

Okay. Maritime safety, we have a Future of Navigation Integrated Action Team. It's co-led by Coast Guard, NOAA and the, and Army Corps. Those are three major agencies that provide navigation services for the federal

government. Certainly, National Geospatial Intelligence Agency does some of that, but that's primarily for Navy, for military purposes.

And this is a team that is probably one of our most high-functioning teams. It's the one I brag on the most. It's one of the first ones we started in 2006 when I came on board, with NOAA's leadership, again, and can't thank NOAA again enough for that.

Russ Proctor's co-lead on that, John Stone from Coast Guard, and Brian Tetreault from the U.S. Army Corps of Engineers. I'm going to talk about these at the end a little bit more, about the waterways harmonization, the enhanced marine safety information, the S100 architecture.

And I know I'm talking quickly, but there's so much to go through, so please forgive me if I'm just too fast. And -- but we'll have time for questions. And -- but again, I'm going to talk about that more fully in a little bit.

Maritime data, I think you can appreciate, there's lots of data out there. We talk about that. Lots and lots of data. The question is, do you have the right data? And in the federal government, can we share that data in a way that's meaningful?

Again, agencies have very clear directives, both in regulation and in statute, that says they are to collect and use data in certain ways. That doesn't mean that that data has to be shared.

And in fact, the CIOs, or cyber-security folks in our agencies and departments are working very, very, very hard to keep you from sharing that data. So how do we get apples and apples together?

And this is a team that has an unenviable job of trying to make that information more sharable, interoperable.

If any of you have gone on data.gov, it's a pretty complex site that the White House initiated. There was never a maritime tab on there, so it could take you hours and hours to find some specific data points in maritime.

This group put it together. You'd think it was simple. It was not. Again, we had to go through departmental CIOs to make that happen, very challenging. It is now completed,

and the question now is to go find all of that maritime data that was kind of mixed in there and actually bring it to the surface and put it under a tab.

And again, harmonizing, you know, data points and information, we're supporting the new Bureau of Transportation Statistics Ports -- Port Freight Statistics Working Group.

If you've heard about that, and they've already met and are having a lot of challenge trying to do port -- freight statistics, when virtually every piece of data Congress wants is proprietary, and is not owned by the federal government. So those are just some of the challenges.

Big in R&D. We have a national strategy on research and development, and the MTS just hit a five-year mark. And frankly, all of the big points of things we were going to do in there, such as work on performance measures in the MTS, and resilience, those things were developed in the R&D and then sent out into other teams to implement.

We just had a research and development conference with the Transportation Research Board. We do it every two years in June. Grateful to Manson Brown for opening and keynoting. We also had, oh the four-star from TRANSCOM, General McDew, who showed up and talked a little bit about TRANSCOM's logistics capability.

So it was probably one of our best, and from that, we'll build and revise the R&D strategy, which there it is. So in two more years, if you're engaged in innovative solutions for MTS, we hope you'll join us then.

Resilience, systems resilience, something that weaves itself through all parts of the Marine Transportation System. We have a team co-led by NOAA and the Army Corps of Engineers, and they have really tried to get to the bottom of what are the different factors in the way we look at resilience of a system.

So just first, even within the federal family, they did an analysis and have a report on our website, both on the environmental side of resilience, and things like market trends, the non-environmental sides, market or workplace

things.

And you can kind of divide the camps in federal government on those two sides. The environmental side, coastal inundation side, and marketplace trends. What happens if you have labor challenges? What happens at the Panama Canal? And is it going to affect the way in which we have supply chain movements?

So that's a team that is also really moving ahead quickly. We are not engaged in environmental stewardship in the big picture, because it's such a big picture. Kind of hard to focus in on just -- you know, on, as a whole.

But we do have a Maritime Energy and Area Missions Group co-led by Department of Energy and the Maritime Administration. They are currently working on a work plan. It's a fairly new group. Working on a work plan to be very dynamic about, ultimately, are there ways to support and enhance the environmental stewardship of the Marine Transportation System.

Military to Mariner, veterans hiring is hugely important. Going to be a shortage of U.S. mariners at any one time. If there were a major sealift capability, they would run out of mariners in about four months.

And so with the White House initiatives and DOT initiatives for veteran's hiring, we are engaged in pulling those federal partners together, about how we could help to transition those shipboard experienced veterans to merchant mariner credentials.

That has been a very interesting process, because in some respects, you're acting some -- asking some of these maritime military agencies for a whole paradigm shift in how they view that.

You know, how do you help them help that individual get a handle on their training of their -- lifetime of their career, especially if they're only thinking about it at the end of that career? But we've had some huge successes, and certainly thanks to Coast Guard's taking a lead on many of that.

Okay. So I'm going to, to the best of my ability -- and thankfully, we have NOAA folks in here and Coast Guard folks in here, who can help correct me when I'm wrong. So with our --

well let me -- wait a sec. Were there any questions about that data dump I just gave you?

Yes, ma'am. Okay.

MEMBER MCINTYRE: So I've been around the maritime for quite some time, and a lot of things that we see up there seem to be duplication of effort in certain things.

MS. BROHL: Okay.

MEMBER MCINTYRE: So relation to your maritime data piece, you know, are you working with NMIO and other organizations out there that are trying to integrate, not just in federally, information and data sharing, but also with private partners and industry, because it's hard for me, as I'm with CLIA, Cruise Lines International Association, so I speak for myself, not the rest of the group, to understand who I'm supposed to be playing with.

I hear MARAD's out there about cyber-security, because that's a huge issue, and sharing information on cyber, because that can have a safety impact, obviously.

MS. BROHL: Yeah.

MEMBER MCINTYRE: We're trying to do that as an industry, but we also have the Coast Guard as the regulators. We also have IMO. We have all these other different things. There seems to be some concern, or at least from myself and my members, about the unity of effort that we see.

So understanding how you all play into the bigger picture --

MS. BROHL: Okay.

MEMBER MCINTYRE: -- is kind of interesting.

MS. BROHL: It's a great question. NMIO is the National Maritime Intelligence Integration Office. So NMIO is a member of the CMTS, and we're a member of NIAC. So we work quite throughout.

Now, so NMIO is intelligence integration. That would be more of a maritime security thing. We have not been that much engaged, collectively. And keeping in mind, first, the CMTS is not a separate agency. It is a collection of maritime agencies and organizations that come together.

All right, so presumably there is no

duplication, but each agency often has their own things that they have to deal with themselves.

So on the maritime security side, maritime administration has certainly taken the lead on some of the alerts and warnings, kind of, you know, send the word out to U.S. flag vessel operators, in particular, not necessarily on the international side. It's really for them to engage the U.S. side.

And the work that NMIO has done, in terms of intelligence integration, is truly on that intelligence side, specifically. That is not a duplication of what we do. We're not the -- CMTS -- we, I'm saying the agencies as a whole, including NMIO, are not that engaged at this time in maritime security.

I will say this. Primarily because there's been so many elbows in that kitchen, there's a lot of yours, mine and ours, so the appearance of duplication could be there. And I cannot -- it's too soon for me to say whether there is real duplication.

But to your point -- and I appreciate it, there is, in the work plan, yet to approved, but for approved by -- for conversation, by Admiral Thomas, on the 21st, to talk about the role, is there a role for this CMTS partnership to start looking at maritime security holistically, who's doing what and where?

What is initially being proposed would be that we actually do an org chart in the federal government. If you work on -- there is the Maritime Security Working Group in the White House, that works under the National Security Council, and it goes all the way through. So I guess I -- my point, I know that I bring that up because security is my background, is it's just, that was a general example that I was giving with the NMIO.

So when you talk about, like maritime safety, that's very, that's a very broad -- it seemed to be more safety of navigation than maritime safety. For me, maritime safety is shipboard things, what else is going on, not just the Marine Transportation System itself, the actual vessels and what's going on.

So my real point here is that there -- it's hard for industry and those of us in the --

who are industry, to understand who is our, for lack of a better term, bellybutton.

MEMBER MCINTYRE: The CMTS.

MS. BROHL: Right. And that's new. That -- and -- but we're not U.S. flagged, or we're not U.S. crewed.

MEMBER MCINTYRE: It does not matter. It does not matter. I'll only say this, if you do not know where to call, call us up, because we're a clearinghouse, all right. One of our jobs is to make sure that you know who, what, when and where.

If you're not sure, it's not our job to know the answer, but it's our job to know who you should talk to, who is the subject matter expert in the federal government, and who is that bellybutton.

You don't have to use us. Go right to your, you know, your agency partners, of course. Our job's not to get in the way of our agency members and you. However, please do not hesitate to call us, and I'll have the contact information at the end. We're more than happy to make sure that we get that right name and contact to you.

And depending on the question, there may be one or more contacts. But in many cases, it's actually a very discreet person, individual or agency. Thank you.

MS. BROHL: Anything else before I try to get through the harder part for me?

So the technical side, while I consider this navigation services work some of my favorite work, and I think some of the great successes, frankly, I am not the techie on this, and so I'll do my best.

The S100 framework is a charting framework, and it was NOAA that came to the CMTS agencies and said, you know, I think it's time for us to truly embrace the S100 in the -- complementary, parallel with the IMO.

And so a resolution, the board passed a resolution, whereby the agency agreed that they would use this S100 framework as a way to transfer data. Now, it's much more -- you guys know it actually far better than I.

And if you've had a chance to kind of read this resolution, it really is -- you would think this common sense and that the agencies

normally adopt this. It has not been the case. And in fact, Army Corps was a little concerned about this framework, because they use an engineering framework, and they didn't want to change.

So this, it wasn't meant to change how we do everything outright, but it was to be very clear that the federal agencies will embrace S100 to be aligned with the geospatial standards.

Now the standards being the challenging part of this, which led us to -- this conversation led the group to say, well if we're truly going to engage S100, get that framework, then we'd better kind of get a sense of the geospatial sense of our waterways in order to do that.

So saying that we're going to do this just means more work. It's starting the domino. But before you can do that, you have to really understand the way in which our waterway -- we have to be able to talk to each other in a geospatial way on our waterways.

So I'm going to read some of the wording on this so I say it correctly. I actually got this wording from the Army Corps of Engineers, and I'm hoping that my friends at Coast Guard and NOAA will correct me.

But you all know that a nautical chart is really the graphic representation of a spot in maritime, right? So in the modern ENCs is simply a data set. I'm going to tell you what you know a little bit, and then expand, of marine information and it's this team, our Future of Navigation team, that felt it was time to harmonize all the maritime information using ENCs as the base data set.

Now, harmonizing sounds good, but there's a lot of waterways in the United States, and I say, 25,000 miles of waterways. That's a lot of charts. That's a lot of authorized channels.

So to harmonize that, so we're all talking about the same geospatial reference between agencies. Now remember, we're not even still sure how we can talk to one another between agencies, in a digital way, or we can have machine to machine talking to one another. So we need a common georeferenced point of interest for

the ENC, and we need that between each of the federal agencies.

So primarily Coast Guard, Army Corps, and NOAA, are working together to agree to support an effort, which we call this Waterways Harmonization Project.

The idea is to start with a pilot study, which is being led by Coast Guard. Thanks to Coast Guard, it's being financed by Coast Guard, but jointly managed by those three agencies.

The goal of that is to ultimately be able to have alignment between agencies within the federal government, of the digital identification and geospatial definition of waterways within the navigation system.

So the only way to do it, though, is to do it. And it really is kind of one data point at a time. And the challenge, there's a lot of data points to try to change.

So right now, there is a contract that just let, was let by Coast Guard on behalf of the team, to begin this process. It is a matter of time and money. So when we say that we truly want to have a e-navigation system aligned with IMO, that talks a good game, but it is truly a huge bite of an elephant.

So I'm going to ask Scott if there's things that you can clarify in that, that I mis-said, or Russ? Shep?

Okay, so my point is, is that this is not a glamorous piece of work. This is the kind of stuff that you tell a politician and they go, I don't see a sound bite in that, where is my press release?

And you say, but sir, or ma'am, this is how we're going to make the system safer, all the way across the board. We have to be able to do this. And they go, well that doesn't sound very sexy.

But this is exactly the kind of work that the agencies should be doing together. And while you don't hear much about it on the outside, I'm hoping that I can assure you that this is of a priority interest within the federal government.

RADM SMITH: Well maybe I could just put a find point on it, because this has come up

multiple times.

MS. BROHL: Thank you.

RADM SMITH: I mean, you mentioned that the Army Corps works in engineering land.

MS. BROHL: Yes.

RADM SMITH: And we work in navigation information land. And this is the fundamental reason that these systems are not compatible is this, right here. And so agreeing on standards of interoperability is really, really, really important.

It takes something -- you know, it could fundamentally change the way we do business, so.

MS. BROHL: Scott?

CAPT SMITH: Yes. For us, really what this does is it allows us -- it's the ground work that's going to be laid to allow us to do that marine safety information digitally.

And until we get our houses in order, like the admiral said, you know, understanding and being able to speak to each other in a common language, we can't build that EMSI that we want to push out to the mariners to get that information in your hands.

So that's really the foundation. It's -- Helen said, well it's not sexy, but it's work that's got to get done. And thank God there's General Smart Dot post on Dahlgren, who got the contract, that are going to do this for us. So thanks.

MS. BROHL: And thanks to Coast Guard for that. Because they had to commit some finances to get this started. I don't know how we're going to deal with it afterwards, but at least we'll have a pilot study to get a sense of how to do it right.

Yes, sir?

MR. LOEPER: Tom Loeper here. I just wanted to put a plug in for my other job, but the other part of this is nautical publications. So we're also working with this, and it's a real bear trying to get our material in here too. So that's something there's, we have international working groups on that, too.

MS. BROHL: You know, if -- this leads me back to, one of the first members of HSRP was a guy named John Gray. John Gray worked for

INTERTANKO and wrote the first report in 1996, which created the term marine -- maritime Marine Transportation System, MTS, where he complained that the left hand and the right hand of government weren't talking to one another.

We don't need to go in waters where you have yours, mine and ours buoys. We don't need to have agencies putting regulations together that are in conflict with another agency. Who are we supposed to follow?

And that led to Congress directing DOT, along with their federal agencies, to do an assessment of the Marine Transportation System in 1999, which led to what we have now as the CMTS. It was about that.

So really, to me, this work on maritime navigation safety gets to the root of what that initial effort was all about. So here we are in 2016, all these years later, really trying to get to the meat of what INTERTANKO was trying to express back in 1996.

So Scott mentioned EMSI, which is Enhanced Marine Safety Information. That is the other part of this. It gets a little bit, really to that how we are going to communicate that joint information to the outside stakeholders.

So this is a -- if the harmonization is kind of led by Coast Guard through interagency team, EMSI is led by Army Corps, and their list of engineers with the interagency team.

The point is to kind of address those different formats, but the way in which we disseminate that information to you in the pilot house, for interested stakeholders.

So this is where, if you're trying to get a sense of Notice to Mariners -- although there are just more than Coast Guard Notice to Mariners, and chart updates and all those things, how do we get that information out to you?

So for the last couple of years there has been a lot of work. It's kind of that basic engineering, how do we talk to one another in meaningful way? How do we harmonize the information that we share, collect, and then share and disseminate to you?

So really, the goal, ultimately, is to provide an integrated information bulletin. Now our pie-in-the-sky idea of this would be that you

would get it through an entire voyage.

As you were in transit on that vessel, this information would come to you automatically, that you wouldn't have to look up that Notice to Mariners, and all of this would be self-correcting in your chart as you go along, no matter who put that information out, federally put that out.

That is our goal. Right now, we're actually at a pretty interesting place with it, because Army Corps has created a beta site for us that's web-based at this time, website. I will tell you, I've looked at it. It's still internal. For me, it's kind of gobbledy-gook.

All of -- you guys would probably look at it and go, oh, that's really kind of cool. But so I got to say, it's, to me it doesn't, it's not as word-based as someone like me would need. It's a little more digitally based.

But the goal is, we're trying to get to that machine-to-machine communication between agencies, such that you bring all those machines together into one, and push it out to you.

So some of the things you talked about, that's what these teams are doing internally right now. I say that kind of close? Okay.

So again, we think the Marine Transportation System is super important. And I know you do too, so we're here really to support the federal agencies, support you guys. We have lots of more information on our website at www.cmts.gov.

Please feel free to check it. Let us know if there's stuff in there that you kind of feel is missing, stuff that would help you get a grasp on the whole of government work in support of the MTS.

Here's the context. I'm the director, but we've got our NOAA liaison, our Army Corps liaison, we've got a Coast Guard liaison and the secretary of the office. And, you know, Facebook us, like us on Facebook, Twitter, all those things that someone else younger than me takes care of.

But thank you for the time. I hope that was helpful. And really, our goal is, you know, to hear you and to bring that word back to

the agencies in an appropriate way. Thank you.

(Applause.)

CHAIR HANSON: Thanks, Helen. As always, a lot to digest. There have got -- we ran a little bit long here, but we have to take some questions here, because there's a lot there for if anybody has anything, off the top.

Lawson?

MEMBER BRIGHAM: Okay, I get to the Arctic chase here. I mean, already some of the information --

CHAIR HANSON: I know. It was Number 4 on the list, you know, and you might want to move on.

MEMBER BRIGHAM: Yes, yes. No, I actually probably should be lower, because, I mean, there isn't any offshore development now in the United States Maritime Arctic, so the hundreds of transits that were going to be there, are not going to be there at least for the foreseeable future.

And it does point -- there have been many studies done on Arctic transportation, and we've heard a lot about it, that the future of the Arctic Marine Transportation is related to the commodities markets, Arctic natural resource development. It's not necessarily directly related to sea ice retreat, or air missions from ships transiting.

So tremendous misinformation. There's a lot of hype, maybe a little less hype now that Shell has moved. So it's a complex, it's a complex subject to study. And it does involve climate change. But in the bottom line, as we've heard in several meetings, all about the economics of the global shipping enterprise, and it's about Arctic natural resource development, whether it's high or low.

So it's a sub-subject, but our working group has to keep on it, so we can cut through some of the misinformation.

CHAIR HANSON: Agreed. I had one for you, and you tell me if there's a short answer, long answer. If it's long, we'll take it off line, but PORTS. I know that you were -- you talked about --

MS. BROHL: As in Physical Oceanographic Real-Time Systems?

CHAIR HANSON: Thank you. I know you were part of an effort, both in the formation of it, but also in 2007 time frame, I believe, there was an effort to get it fully funded on the federal side. Can you tell us a little bit about that effort, and what we might redo? Obviously we can't talk about lobbying here, but just kind of, from a -- what message does Congress need to hear?

MS. BROHL: Well, honestly, I hesitate to speak for NOAA, because it's NOAA's program. When I testified, when I was with the Great Lakes Shipping Association, on behalf of the National Maritime -- National Marine Safety Coalition, I testified, one of the very first hearings. I talked about real-time systems. It was really an IOOS hearing.

And it was my statement back then that the federal government already had their -- that IOOS and -- please apologize if I say this, because I don't mean it as, in any negative way at all, but for academia to take over real-time observation, environmental observations for ship operations, is probably inappropriate, because of the operational nature of the business, and that the federal -- and that the Congress should look to PORTS for that.

What we always found is that not unlike funding from the Harbor Safety Trust -- excuse me, Harbor Tax Fund. I'm sorry. My brain's a little scrambled.

(Off microphone remarks.)

MS. BROHL: Thank you. That one. HTMF. That -- okay. That's like CTMS. I know. That Congress talks big, but they don't actually do what has to be done to make it happen.

And as long as PORTS continues to have the appearance of being the perfect public/private partnership, they don't need to. As long as the local sponsors continue to fund it, you know, why would Congress have to do it?

Now I'm not proposing anybody turn it off, because you absolutely need it, and pilotage organizations need it, number one. And how do you charge, you know, sailboarders to use the information they get from PORTS programs?

The challenge is, I don't think they truly under -- only a couple of people in

Congress understand it. That's the challenge.
CHAIR HANSON: Okay. All right. Thank you. And I appreciate the time again, Helen. No, no.
(Off microphone remarks.)
CHAIR HANSON: Okay. All right Ashley, thanks for hanging in there. Our final guest speaker for the afternoon is Ms. Ashley Chappell, with the office of Coast Survey, and national coordinator for the Integrated Ocean and Coastal Mapping Program.
As you will hear from Ashley, also not a stranger to the HSRP, the IOCM Program delivers a forum for interagency coordination to integrate and disseminate ocean and coastal geospatial data and related products.
Ashley, all yours.
MS. CHAPPELL: Okay, thank you. So would -- I figured I would have about ten minutes. That's okay. What -- do you think I could have 15? Okay.
So I don't know if you looked at my slides --
CHAIR HANSON: You have to tell a rock and roll story, though.
MS. CHAPPELL: Oh dear. I'm all classical music.
CHAIR HANSON: Just teasing.
MS. CHAPPELL: I talked to you in Galveston without slides. So I don't know if you had a chance to look at my slide deck, but in the background, I just have a quick summary of what IOCM is.
And I actually thought, you know, given Mike has alluded to IOCM, Ed, Brandon, I thought if you would indulge me, we could just jump to the background and quickly flip through those, if you don't mind, especially for anybody who's new to the panel, so can you just do that?
Background. So just a very quick summary of what IOCM is. Planning, acquiring, integrating, managing all kinds of data in the ocean and coastal realm. It's not just hydrographic, bathymetric. It's all kinds of things, and for many, many different purposes, not just nautical charting, habitat mapping, virtually any activity, in a way, is mapping.
And so we've divided what IOCM is in

order to get our arms around what IOCM is, because you could pretty much kind of tag anything with the IOCM label.

The way we think about it in our program, is in three ways. So we divide it into data acquisition, end-to-end data management, and then maximum use and reuse of that data.

Why -- for data acquisition, why would you do that? Obviously, you want to be smart with federal dollars, taxpayer dollars. You want to coordinate. You don't want to have duplicate collections, all of those good things. So acquisition is pretty much, actually the easiest, easiest thing. When we talk about IOCM, people really get the acquisition piece.

Managing data. This is another important piece. It's a little more esoteric. It's a lot about metadata and, you know, things that our National Centers for Environmental Intelligence do, NCEI, formerly NGDC.

So there's a lot of interaction there, on stewarding data, but making sure that that data is well stewarded, and so that it can be used and reused in the future.

And then, of course, the third piece is teeing that data up to be used. And we kind of, we kind of put a hard stop on what IOCM is right there. It's getting the data to the place where somebody wants to, and can use it.

And then the uses of that data, we let others worry about. We let the Brandons and the Office for Coastal Management and the ship operators and everyone else worry about how that data gets used. So that's just how we've kind of bracketed who we are.

And then just a short slide on, my little IOCM program is four people, three or four or five people in the office in Silver Spring, the IOCM Center at UNH, 21 NOAA programs. We have a NOAA IOCM program, and then we have virtually the same thing at the interagency level, so 11 federal agencies.

And then I always put you, because it's not just you, the HSRP, but it's usually everybody that I'm talking to, as part of IOCM. So where am I pointing? Oh, that's the last slide, probably.

So let me jump back. And what I'm

here to do today is update you on the coastal mapping strategy, where that stands, and then just a few other things that we're doing in IOCM.

So you were very kind to look at the National Coastal Mapping Strategy. We talked about it in Galveston. You've looked at it since. I think you're going to discuss it right after I finish, and provide us your comments, which we've been waiting for. Glad to have those.

The public comment period is over. We're going to take your comments and fold them in to that feedback, and how we're managing the comments. Excuse me. And we're also actually implementing things that are in the strategy already.

The four components of that strategy, just a quick refresh, were annual coastal mapping summits, which we have since sort of adjusted to be more regional in focus, so we could have, you know, seven different coastal mapping summits.

We really felt like the one annual summit was too big, or not enough time to really afford any particular region some good attention. So we're trying now to break it up into regions.

Common standards, we've talked about standards a bit here today, but this is a common approach to, in this case, for Version 1, is topobathy LIDAR. When we get into Version 2, it will be for other things, and I'll speak to that in a minute.

That whole life cycle approach to data, getting back to one of our tenets of IOCM, which is that data stewardship component, and then R&D on new tools and techniques.

Where we're heading next, after we fold in all of your comments and others, and come out with a final draft for Version 1, again, just on LIDAR, on LIDAR elevation. We are moving on to Version 2. We've sort of had some lessons learned on how to do this kind of report.

We based it on topobathy LIDAR because we had the sort of hanging fruit of the JALBTCX partnership with NOAA and Army Corps, NAVO and USGS, and it was a good place to start, to get our -- get a handle on what a coastal mapping strategy could be.

But that left a lot of the ocean

untouched, so we need to expand, move out offshore more, into other technologies, other acquisition technologies.

And we're going to build from agency inputs like the NOAA Hydro Survey Priorities effort, other partner agency priorities, like BOEM, just folding a lot of that in together to come up with a strategy for 2.0.

One of the things we had had in our first, in 1.0, in the topobathy piece, was that we should look at kind of doing the same thing for ocean and coastal that USGS and the 3-D Elevation Program did for topo LIDAR. And we wanted basically to do a NEEA follow-on.

And we've already, thanks to Coast Survey for the funding, and to NGS for the contract mechanism, and to USGS for contributing their insights on how we might frame a task, we've actually put out a contract to do just the scoping study for what a NEEA follow-on might look like.

And that will be to update NEEA itself, and then add on the ocean and coastal components, so I'm really excited to get that moving. Looking forward to that.

Another aspect of our coastal mapping strategy, of course, is the coordination piece. We looked at SeaSketch in Galveston. I don't know if anybody of you have gotten on. Ed's talked about it already a couple of times.

But this is our coordination site that we're using to collect mapping data needs, mapping data plans, and of course, the goal is to put the two together, in order to maximize the dollars that are spent, the resources that are spent on data acquisition, and of course, avoiding duplicative efforts.

And it's actually going really well. This will be the second year that the 3-D Elevation Program will use it for their Broad Area Announcement to their matching grant program for topo LIDAR. And of course, we have the coastal component, through the Interagency Working Group on Ocean and Coastal Mapping.

And this is -- we take in anything from anyone who is acquiring data or has a data need. So just put it on there.

One thing that happened when I was

developing this little slide presentation, I got confirmation that our agreement with Quintillion, which is a fiber-optic cable laying company, who is working on a big project in the Arctic, has agreed to share their data with us.

This is something that has been sort of in the mix, I think, for three years now, from when they first proposed, you know, that they were putting this cable in.

And we saw it as an opportunity for, you know, for them to share data, if they were willing, right about the same time that we were doing the agreement with Shell and ConocoPhillips and Statoil, back, you know, certainly when things were really heating up on Arctic exploration.

But this agreement has actually come to fruition, I'm excited to say, and they will start sharing the data that they've acquired to -- that as you can see on the map, comes into these communities. And we're really excited about it.

The specs they used to survey meet our NOAA hydro specs, which is absolutely terrific. But what I'm really excited about is, it's a good example of, you know, a private sector entity sharing their data with NOAA, and not -- there's really no expectation of anything in return.

But this -- having this data, I think, will be terrific in getting into those communities, and matching up with the data that we've been acquiring for the last few years that we've been working in the Arctic. So it's a good example of the kind of partnership we can develop.

Okay. So this is, figuring I only had those ten minutes, kind of the laundry list of the things that we're working on this year. It's in really small print because there's so much on our plates, but I'll just hit the highlights of things I wanted to share with you.

I talked about the strategy already, and the NEEA follow-on. Regional coastal summits, actually Brandon was alluding to this earlier, with the Great Lakes, one we're planning for the Great Lakes this spring. We're just getting started on that.

And that is to bring in as many folks

as we can to talk about data needs, data plans, what their requirements are, why they need the data, where they need it, you know, just getting people together around the table.

We did this in Alaska in June. It went really well. Ed was there in the room. I think Dave, you were on the phone, which was a little bit of a struggle, but it worked really well.

I think, almost simultaneously that we were doing Alaska, or maybe right before, USGS was hosting one in Lacey, Washington. So we were, hit the northwest. We have plans for the southeast, with our NOAA National Centers for Coastal Ocean Science, and the Pacific Islands. That one will be done in conjunction with USGS.

So these summits, these regional summits that I've been talking about, that's, you know, how we put those into action.

Other things we, we're working on, let's see. Oh, the one thing I did want to highlight for the rest of this list is Ocean and Coastal Mapping Integration Act re-authorization.

The Act that authorizes IOCM is actually up for re-authorization. And if it's something that you wanted to look at, I'd welcome your input on that. I have some ideas about what a new authorization could say. But if it's something that you wanted to put on your plates, too, to look at, I'd welcome the input.

And I -- yes. That is my quick tour of IOCM.

MEMBER SAADE: I'll go first. I have to go first. Because when we were working on the Quintillion -- this is Ed Saade. When we were working on the Quintillion project, we actually recommended that they donate the data, as when we work with everybody else in the Arctic.

So it's great hear to that somebody actually did that. And I'll vouch for the data when you get it, so.

(Laughter.)

MEMBER SAADE: But I'd also like to just point out that the SeaSketch database or mapping aid is really useful. We've been actually using it for commercial purposes around the New England area, to take a look at where data already exists.

There's a whole lot of wind farm activity going on there, and there's lots of tenders coming out, and having that database there to see whether there's already data that exists, or give you a better idea on what the geology is like, or the seabed conditions are like.

So there's a lot of applications beyond just additional government mapping that those, that product can be used for. So I wanted to make sure you got some credit for that, and say thanks.

VICE CHAIR MILLER: Just an interest question for myself. When do you anticipate the Pacific summit?

MS. CHAPPELL: I don't have a date for you, Joyce. Sorry. I have to talk with Jeff Danielson at USGS. I think he's thinking late, late spring.

VICE CHAIR MILLER: Next year?

MS. CHAPPELL: Yes.

VICE CHAIR MILLER: Okay. Keep us involved, because I'm still, I'm still actively mapping --

MS. CHAPPELL: Okay.

VICE CHAIR MILLER: -- you know. Do you -- is there, is there any sense that there will be any additional mapping done with President Obama's announcement last week of --

MS. CHAPPELL: Of the --

VICE CHAIR MILLER: -- 500,000 more --

MS. CHAPPELL: Adding to the monument?

VICE CHAIR MILLER: Yes.

MS. CHAPPELL: I don't know. I haven't had time to look at that.

VICE CHAIR MILLER: I mean, we haven't gotten the original one done yet.

MS. CHAPPELL: I know. There's a lot to do over there already, so.

VICE CHAIR MILLER: Yes. Thank you.

MEMBER THOMPSON: I just wanted to echo Ed about SeaSketch. In the state government, we use that tool. It's a very helpful tool to help partner, because of funding that was always an issue.

So I'm glad you're joining that, because that allows us, the state government, to go to one source, see who has needs there, and

then we can work on the partner to collect at one time for multiple use.

MS. CHAPPELL: Yes.

RADM SMITH: Yes, actually I think this Quintillion thing is awesome, and we, you know, we should definitely make a huge fuss, not only over them, but over -- it was Fugro, you were involved in as well. So fuss over them not only because they deserve it, but to encourage others --

MS. CHAPPELL: Exactly.

RADM SMITH: -- who might want to be fussed over in a similar way, so --

(Laughter.)

RADM SMITH: So let's brainstorm some ideas on how to make a big deal out of it.

MS. CHAPPELL: Yes. Actually, one thing that Ed and I are sort of working on is figuring out -- because the, when you give this data, you can call it a charitable donation to the government, and therefore a company, a business, or even an individual could claim it as a charitable donation on their taxes.

But it's that nuance of what they get to claim. You know, is it the acquisition cost, is it the market value? So we have a little work ahead of us to figure out, you know, how we might properly guide people if they chose to take that option.

DR. MAYER: If I may make a suggestion, it turns out one of those Quintillion lines is exactly a line we were going to run this summer on the Healy. And having known about this, we've shifted the line as soon as we learned that, indeed, the data would become available, which is just fantastic.

But it did start up a long-term discussion with the ICPP, I think, it's the International Cable Protection Panel, or something which is, the organization that represents all of the cable folks.

And they are having their annual meeting of their executive in Portsmouth in a couple of weeks. And if it's possible for you to attend, I could try to arrange that, because one of the topics of discussion there is going to be this broader issue of making the data available.

It's something I just haven't done in

the past. And I think this is a great start. So I'll -- if it's --

MS. CHAPPELL: Larry, that would be great, if you would make that happen.

DR. MAYER: If it's okay, I'll try to make that arrangement for you.

MR. DEBOW: Especially -- has anybody, you know, having a concerted effort to reach out to other organizations like the oil patch industry, et cetera, to get data sets?

MS. CHAPPELL: Well, I've had some help in trying to reach out to the oil companies, but once you get into them, it's been a little, kind of, just directing all over the place. I haven't quite found the perfect solution to finding the right person, the bellybutton, so to speak. But --

(Off microphone remarks.)

MS. CHAPPELL: Yes.

MEMBER SAADE: So if I could add to that, there's a lot of issues with proprietary data, whether it's an exploration company working for the oil companies, or the oil companies themself. So they're really slow to move on it. They say all the right things.

We haven't had much luck in Alaska, getting them to donate data, but we're working with Ashley on finding ways to sort of dumb down the data, to decimate it, so we, if we have a huge area that's all multibeam, nice data density, maybe we can take that down by two orders of magnitude, or three orders of magnitude, and make that useful to NOAA and make that acceptable to the oil companies, but we're just starting to have that conversation.

And there is, there is precedent for donating data that we did back in the California mapping program, where we donated a lot of data around the Farallon Islands, or we got the owner of the data to donate it, and worked out the tax issues on all that.

So we've got a precedent there. We just need to be able to do it with some other owners of data.

MS. BROHL: May I ask Ashley a question? Are there other agencies that practice that, where something like data is donated to them? Are there other practices, and are the

challenges with just that you -- the legal challenges NOAA related, or do you think more federal government related?

MS. CHAPPELL: Well there are no mapping agencies. None of my interagency working group partners have done that, or advertised it. I mean, it's not something that has to happen. I mean, certainly we can accept data without worrying about what the owner of it does, so.

It's just, I've been thinking it's, it might be something nice to maybe sweeten the pot, so to speak, or share.

MR. ASLASKEN: Yes. So I just think that's -- we ought to pursue, especially with the, not only in the sonar world, but the remote sensing. A lot of that data is licensed, and I don't think there's an awareness that these folks could actually maybe donate those data and get tax benefits from it.

So I think this is something we ought to pursue, broadly.

CHAIR HANSON: Well again, thank you very much. We knew this was going to be an interesting panel, so well done. Thank you.

(Applause.)

(Off microphone discussion.)

CHAIR HANSON: All right, let's go. We'll move on to the next part of our agenda. This is the final session of the second day. And this is where we roll up our sleeves and get our report outs from our working groups, and have some pretty healthy discussion. These seem to always generate that.

And I know we've had some updates on the papers, that you guys have been working hard with both ears and both hands. So very good. And so let's go ahead and start off with Gary Thompson, your working group.

MEMBER THOMPSON: Right. So we just heard Ashley give an overview of the paper that we've been reviewing. I have to compliment, and one of the things I was originally concerned with was perception of the USGS 3DEP, and this being a 3-D nation.

But when you read through the paper, you see that they've done a great job of coordinating with USGS. SeaSketch is another great way, so I don't have those concerns

anymore.

So the paper is very well developed, I think. One of the things I like about it is the common standards they have in there. In North Carolina, and in the other states, we always, we have the collect it once, use multiple times, and I think this project is headed in that direction, so.

So we put it out for comments, and I think we've had a few. And Joyce, you want to go over what comments you provided?

VICE CHAIR MILLER: Okay. There were some -- Ashley? Is Ashley there? There were some pretty much editing comments, except for one. And on Page 12, you put up a IHO data bathymetry quality equation. And there's some factors, the A and B on the -- that aren't explained what those are, or how they should be.

So we may have told you, we may have said something about that in a phone con or something, but I just wanted to make sure it was noted.

And one question. You said, object detection criteria were not considered. Why not?

MEMBER THOMPSON: Because it's Pandora's box, depending on who you talk to. The idea behind the Coastal Administrator was to get to a standard, and the application of using it for obstacle detection is dependent on the agency and/or the user perspective.

And what we were more concerned about is getting an agreement to standards that we all could collect and disseminate data by, and the interpretation of that data by a hydrographic office or a non-hydrographic office, whatever the application, and we'd leave that up to the user.

And it's something that we understand and know the importance of object detection with LIDAR technology. It is very different perspectives, whether that's the Navy, NOAA, Army Corps.

And when you talk, when you're mixing hydrographers in with the use of LIDAR data, it gets even more complicated with those standards, mixing those standards.

So we thought we'd leave that alone, and let, you know, let that be a, maybe part two, and just move on as to the collection of the data

being the important thing.

VICE CHAIR MILLER: I once wrote a paper with an Australian guy. It was on the IHO standards. And they were all over target detection, you know, and there was a lot of discussion of, you know, what should be included in it. So I was just curious what happened.

My most substantive comment is, there is a place in the -- on Page 14, your report, or your document states, Agency B and Agency -- Agency A and B have plans to collect data in the same region, but one agency requires different quality levels.

The current -- this report goes on, through subsequent discussion, Agency B agrees to acquire data to meet quality level 3B, which is Agency A's requirement. From direct experience, there is real, serious cost in collecting to a different standard.

And I would note that on the NEE, or what -- the National Elevation Enhancement report, there was a really excellent table, or series of tables, that clearly outlined the different costs in the quality levels for LIDAR.

And I'm assuming that if there is a follow-on report, hopefully that would be done. But I wondered what, to what extent IOCM should be working on mechanisms to make that -- and the entire issue that we ran into when collecting data out in the Pacific, was it was almost impossible to get money in from other agencies. It is not easy.

And it's not easy for NOAA to pass data out. And I know there have been agreements. Actually, that's one question I wanted to ask to Admiral Smith.

Has the Army Corps agreement actually been put into place yet?

RADM SMITH: Yes. It was signed a couple of weeks ago.

VICE CHAIR MILLER: Hurray.

(Applause.)

VICE CHAIR MILLER: We made that recommendation, what, three years ago? Charleston. Yes.

(Off microphone remarks.)

VICE CHAIR MILLER: Yes. So can you -- I would have liked to have seen a little less,

oh this is easy to do, statement in there, and have IOCM consider some of these ways to facilitate this kind of -- I mean, I think it should be done. Map once, use many times, is certainly what I believe in. But, I mean, it's just sometimes impossible to pass money between agencies.

MS. CHAPPELL: It is difficult, and we actually are working on an agreement, kind of like the Army Corps one, that just sort of sets up partnerships among all the IWG-OCM agencies, most of, if not all of the federal mapping agencies in the ocean and coastal mapping realm.

We're working on one that everybody could sign, or sign up to. And with that -- excuse me. Let me just check on that. I don't know how to work my phone.

The format that I'm hoping everyone agrees to use is a format that you get the initial agreement set, and then there's just a funding transfer document, which would speed the process along. So hopefully we can get everyone to agree to that.

One thing that I think has been a great start at the Federal Geographic Data Commission level, Committee level, is they are collecting all of the different contract vehicles that agencies have, and posting them in one location, so that we can be better informed about who has a contract for what.

And then, you know, that would facilitate using that contract, with an agreement. But then having this agreement, as I'm envisioning it, you know, that transfer would be quick and easy with the secondary transfer form, of a Form 7600. I don't know if anybody's familiar with that. You probably aren't.

But I'm hoping just to make it as easy as possible. NOAA, fortunately, has an authority that allows us to receive funds. So usually there's no problem legally taking the funds. It's just getting them in time, efficiently, and to the right office, that's supporting the work.

(Off microphone remarks.)

VICE CHAIR MILLER: Sorry. The last comment I had was on the same page, 14, you talk about joint data management. And I thought it would be -- it would improve the document if you

address common data formats.
MS. CHAPPELL: Okay. I'll take a look at that. I think we did get a, sort of a pre-look at your comments, which was helpful. And we'll be factoring them into our, you know, longer list of comments. And then we'll show you how we've addressed each one, and how we've incorporated those thoughts into the document. So thank you.
VICE CHAIR MILLER: You're welcome.
MEMBER THOMPSON: So Bill, that's the all, all the comments we received. So unless we have more comments, we can finalize the document, and make it final.
CHAIR HANSON: Sounds good.
MEMBER THOMPSON: All right.
CHAIR HANSON: Ready to rock and roll.
MEMBER THOMPSON: We're ready to rock and roll. Long live rock and roll.
CHAIR HANSON: All right, so you think you're done, huh?
MEMBER THOMPSON: Unless someone else has some comments.
CHAIR HANSON: Well, thank you very much, Gary. I appreciate it. Well done.
Next is our Planning Engagement Working Group. And -- I'm sorry. I've been reminded. We're going to take a break. Ten minutes. No more than ten minutes, okay?
(Whereupon, the above entitled matter went off the record at 3:00 p.m. and resumed at 3:16 p.m.)
CHAIR HANSON: All right. If we can get back in action here. Punch the time clock. You ready to go?
I truly appreciate everyone speaking into microphones, and it has never been a problem with this group being, speaking clearly, or loud enough. So I appreciate that, for the transcriber.
Of course, this being a public meeting, it is recorded, and we do get minutes distributed timely, in a timely manner after the meeting, for us to review and to approve. And for the record, I'm required to mention that the -- repeat that the Galveston minutes were completed, reviewed and approved, so. That was for that. Okay.

So let's move on to the next one. We're going to talk about issue papers. I think we also have site selection on the discussion menu as well.

VICE CHAIR MILLER: Yes. Let's wait until Shep and -- anyway, we could -- we --

CHAIR HANSON: You want to talk about issue papers?

VICE CHAIR MILLER: Yes. Let's start with the two easy ones.

The good news is, all three papers have been either just tweaked, or to some extent rewritten. I'll start with Hydrography, a Core NOAA Mandate. I had basically three suggestions. I changed the percentage, as Helen requested, to 72 percent of the United States overseas trade by weight.

Rich Edwing suggested, and I put this under the sidebar in the hydrography paper, a sentence that this document focuses on the bathymetric data and charting aspects of hydrography. He thought it would be a little bit clearer.

And then finally, the last recommendation, and this was, this was a recommendation from Larry and Andy, because of the wording of the -- well, because of the need, as much as anything. Instead of saying, support appropriations for additional hydrographic training centers, they suggested I use ocean and coastal mapping training centers, and omit the reference to the IOCM, which I did.

And those are the only minor changes that were suggested in that, to me.

MR. EDWING: Joyce?

VICE CHAIR MILLER: Yes?

MR. EDWING: I had sent you some actual language to put in there.

VICE CHAIR MILLER: Oh, okay. I'll take -- I didn't --

(Simultaneous speaking.)

MR. EDWING: -- lunch or an hour ago, so.

VICE CHAIR MILLER: Okay. Can you read the language you said to request, and we can review it?

MR. EDWING: Sure. Let me get that book down.

So my concern, what I was trying to clarify was, we use the term -- oh, I'm sorry. We use the term, hydrographic services, in there, which really refers to all three programs that you have purview over, but the rest of the paper is really on hydrography, which is the more, you know, narrow activity under the services.

So I just, in the, I guess it's the third paragraph, which starts off, hydrographic services, I just put in parenthesis after that, mapping and charting, oceanographic observations and positioning, in parenthesis, and then continued the rest of that sentence as was written, are essential to the nation's economic health.

And then I added a short sentence, hydrography is a key activity under this suite of essential core services. So it just makes that transition from the broader hydrographic services to the activity you're focusing on under this paper, so.

VICE CHAIR MILLER: That's fine with me. Does anybody have any other comments? I think nobody wants to say --

MR. BOLEDOVICH: I'll choke on my broccoli, as I'm going to do here in a second. Yes, it's important to be clear, because both the term, hydrographic data, and hydrographic services, are defined in the HSIA, and they include everything that we do here.

VICE CHAIR MILLER: Yes.

MR. BOLEDOVICH: Which obviously that, it's not a very good definition in some ways, because it has confusion, since you'd have to clarify, like you're stating, Joyce, about how this paper focuses on the bathymetry part of hydrography, so -- because it's become a term of art in the Statute that a normal person wouldn't associate with hydrography.

VICE CHAIR MILLER: Okay.

MR. BOLEDOVICH: A hydrographer wouldn't associate with hydrography.

VICE CHAIR MILLER: So you suggest I leave the sentence that I wrote in, in the text box? Okay. All right. And I will, I'll have to check how the two go together.

Perhaps let's move to the sentence that you crafted, and I'll try to get this

together.
MEMBER THOMPSON: Okay. So then, for Reference Frame 2022, you asked for a motto of what the future looks like.
Sorry about that. So for the Reference Frame 2022, you asked for a one-liner we'll put at the very top. So here's the proposed wording. The replacement of NAD 83 and NAVD 88 would impact everyone in the U.S., from professional applications and services to recreational users who use maps, charts and satellite positioning systems such as GPS.
CHAIR HANSON: Can I make one suggestion?
MEMBER THOMPSON: Yes.
CHAIR HANSON: Or recommendation. Can we add, dramatically impact?
MEMBER THOMPSON: Yes.
CHAIR HANSON: I mean, some --
MEMBER THOMPSON: Yes, so just say, will dramatically impact?
CHAIR HANSON: Yes.
MEMBER THOMPSON: Okay. Okay. And that will be the first sentence in, right under the title.
MEMBER HALL: Gary did that by, all by himself. So thank you, Gary.
MEMBER THOMPSON: Not bad from a guy from North Carolina. So that's good.
VICE CHAIR MILLER: Okay. And I -- the PORTS paper has been rewritten enough, and I'd like for Ed and Kim to take lead on this, to review it. Let's put it up on the screen. We don't have printed copies of it yet.
MEMBER HALL: We do have a printed copy.
VICE CHAIR MILLER: Oh, do we?
MEMBER HALL: Yes. They were passed out during the break.
VICE CHAIR MILLER: Okay. We do have a printed copy. All right.
MEMBER HALL: So with our new mandate to look at this from where is the system actually vulnerable, and that has always been the funding source, the -- is it multiple sources? Is it federal? What does it look like?
And Glenn provided us with some great background information related to the HSIA, the

actual legislation, as well as the appropriations report language and a couple of other things that support that. NOAA's been told and authorized; just haven't been given the money to do so.

So what we did to redo this a little bit was we took out some of the, kind of the, what we thought was the compelling argument before for why PORTS needs to exist, and instead inserted the information about, you know, there's a myriad of users, there's a lot of reasons why it should, but by the way, funding is where it's vulnerable.

We heard today from the folks in the Great Lakes that are a couple of the, which one was it, current?

MEMBER KELLY: Current meters.

MEMBER HALL: Current meters were being turned off because there was no funding to have those. And that's problematic. We want the PORTS systems, and we want it up and operational, not just expanded.

So I don't know if we need to go paragraph by paragraph. It is almost a complete rewrite. We've used some of the language from the previous one, stolen from some wonderful documents from an unnamed source, and ended up at this final version.

It still needs to be polished. My big question for the group -- I know you've just gotten it, is does this seem to answer the mail? Does it seem to be the way forward that we wanted to take? Because there's been a couple of different iterations, and what we were actual concentrating on.

And then I can polish it. But as a previous military admiral I worked for, I do not want to be polishing a turd. So I would appreciate any feedback at this point. I'm not sure if it's going to be ready for prime time at the end of today, but maybe tomorrow we can agree on it. Thanks.

MEMBER KELLY: No, yes. As Kim said, I think we're ready for this. It's just a matter of a tweak or a word here or there, if that's the case. I think it does present the case that PORTS is an essential, valuable asset to the nation.

And it also keys out the diverse

multiple user issue. And it keys back to the fact that NOAA actually has been charged, in the HSIA and subsequent Senate issues, to fully do this. It's been a question of money.

And, you know, we go back to NOAA at some point in time. It's really incumbent on NOAA to find some place within your budget where, that pays for this. You've been instructed by Congress to do it. So there it is.

MEMBER MAUNE: Ed, is this now fitting on one and three-quarter pages?

MEMBER KELLY: It's printed on one and three-quarter. We may or may not have to put a reference as, if people want, where the statistics --

MEMBER MAUNE: Okay.

MEMBER KELLY: -- came from.

MEMBER MAUNE: Somebody suggested this morning, wouldn't it be nice if we had a graphic that showed where we have PORTS and where we need PORTS, with two different colors, or something like that. And I wonder if we have such a graphic and would there be room for it. And --

MEMBER KELLY: Damn. People just keep making this thing more and more complicated.

MEMBER MAUNE: I know. We keep ---

MEMBER KELLY: You know.

MEMBER MAUNE: We keep wanting to add to it. We keep wanting you to go over two pages.

MEMBER HALL: If you go to 6-point font, you could probably do it.

(Laughter.)

MEMBER MAUNE: No, just a thought.

MEMBER HALL: If you get rid of 1-inch margins, go back on 6 point, less than a single space, I can make that happen. Rich did offer up a, a least an updated version of the current, current graphic we had. I'm not sure that graphic actually makes sense for what we're trying to do now.

I think the one, Dave, that you mentioned, if that does exist, makes more sense as a visual aid to what we're talking about than a pretty picture of a system. So I think we could replace it, if we had that. If not, the pretty picture, you know, gets somebody interested, I think.

MEMBER MAUNE: Rich, does that graphic

exist? Where we have PORTS and where need them.
MR. EDWING: Yes, it does. And we can provide that.
MEMBER MAUNE: Does that sound good to you guys?
MR. BOLEDOVICH: I guess, it's going to be a map of the U.S. If you make it this big, you won't be able to --
MEMBER MAUNE: Yes. It's --
MR. BOLEDOVICH: -- see it, so just be open to other options.
MEMBER MAUNE: Depends on how big you make your red/green dots, I guess.
MR. EDWING: Yes.
MEMBER HALL: Thanks. I think we can maybe do a highlight of a certain region, or we can do something where we do, here, this is ---
(Off microphone remarks.)
MEMBER HALL: Well, we've also -- yes, here's where PORTS is, and maybe that is too ---
(Off microphone remarks.)
MEMBER HALL: Yes. So I think there's some options that we can look at, but that makes --
(Off microphone remarks.)
MEMBER HALL: Yes. And maybe we do a concentration on a certain area, just say hey, that this is one example of a place where we see there's a couple of place on that graphic that are highly concentrated, and that might be a good example. This is just a visual aid. It doesn't have to be the complete story for that graphic.
CHAIR HANSON: I think one of the concerns will be, as we take this the next step, people that we meet from around the country will want to know what's relevant to them.
And so, whether we have a map, or we have a list of places that it's installed, people will see that it's actually relative in New York, it's relative around the country. So somehow we have to make that tie, that it's relevant to region or to a port.
So whether you have a map or list, just something along those lines. Another --
MEMBER HALL: We can change it per person, and where, say where is Dr. Sullivan from, and we can get her area of the --
CHAIR HANSON: There you go. There

you go.
MEMBER HALL: -- country.
CHAIR HANSON: Well, can you put outer space on there?
MEMBER HALL: Whoa. Whoa.
(Laughter.)
MEMBER HALL: That's on the record, Bill.
CHAIR HANSON: Well, but I was compliment -- it's a compliment.
MEMBER HALL: Okay. I wasn't sure if you were telling me that Dr. Sullivan is from outer space. So I apologize. Misconstrued. I correct the record.
CHAIR HANSON: No. The latest former chairman. The only thing I would like to see is maybe a greater tie between the issue and status and the PORTS as to how the PORTS solves the issue in the first paragraph.
I mean, you talk about the navaid safety in the first sentence, but if there's a way to tie that a little more dramatically together, not just --
MEMBER HALL: We have something there that we can expand on, with that last sentence on the first paragraph under, PORTS, a vulnerable system. I think we can probably make that a little stronger. Yes.
CHAIR HANSON: Thanks.
MEMBER MAUNE: How long will it take to make these changes? Is this something that's going to take another week or something to get the graphics?
MEMBER HALL: Who's buying me the beer, the $8 beer at the ballpark, and then I can tell you a time frame.
(Laughter.)
VICE CHAIR MILLER: It may be that we would have enough time. We have two more hours, and the papers are largely -- so we have two committee reports left after the, after we get done with the issue of the next meetings.
So maybe we can allow a half hour for a final polish. I mean, NOAA does the final formatting and everything, and that may get -- and we send them with the letter. So we would have approximately a month to get a graphic in there.

You know, we -- you know, our goal is to have the letter out to the Administrator one month after the meeting. That's what's in our standard operating procedure.

MEMBER MAUNE: I was thinking that NOAA's current graphic is probably a big graphic with small dots, and we probably need a smaller graphic with bigger dots.

VICE CHAIR MILLER: Bigger dots.

MEMBER MAUNE: And that will take some time to prepare.

VICE CHAIR MILLER: Yes. But I think we -- I don't think that's a big issue.

MR. BOLEDOVICH: There's been so many graphics of where PORTS are. Excuse me. I'll defer to Rich, but that should be pretty easy to put together.

VICE CHAIR MILLER: Yes.

(Off microphone remarks.)

VICE CHAIR MILLER: Yes. Yes. So we have a --

MEMBER KELLY: That -- this is the graphic, I mean, and it just has to shrink down to size. It might get lost a little bit. But I think if we can agree on the format of the paper, with the best picture available to put into that graphic slot, I think, you know, can we move that way? Then this paper goes to bed, and we get whatever does turn out to be the best graphic that fits in there.

MEMBER HALL: Right now, the copy that I have on my computer, it does have a -- that, the current graphic, based on what Rich had given me earlier, we needed to update it. So there's a -- just, this is just a placeholder graphic. This is not the final graphic, whatever way we decide to go.

MEMBER KELLY: And even if we inserted a slightly larger graphic, we still do have a little bit of room on the bottom of the second page. So we certainly can accommodate a suitable graphic. And I think if we can agree on the verbiage, we're pretty much done with this.

VICE CHAIR MILLER: I would agree.

MEMBER KELLY: Which, you know, if anybody has comments, substantial comments on this, there's one or two words, you know, that we might just smith to make it read smoother. But I

-- as far as I'm concerned, and I think pretty much, we think this is a pretty good product right now.

MEMBER MAUNE: I don't know what color coding you have. Do you have green for where we have them already in good shape, and red where we need them, or something like that?

MEMBER KELLY: Well red is every place, every other port. And, you know, even on Coast Guard definition, or MARAD definition, you know, I think our Corps of Engineers says there's 362 significant ports in the United States.

You know, I would think they're stretching the parameter a bit, but I think it could be very feasible there could be at least 100 locations that would benefit from a PORTS style array.

And whether or not it justifies the money to put it in there but, you know, we could cover the whole rest of the United States, river entrances and everything else, with wannabes. So I don't know if that would be good to do or not.

MEMBER MAUNE: For me, that graphic could be the most important part of this paper.

MEMBER HALL: Thanks, Dave.

MEMBER MAUNE: After all your hard work. But I like a picture that says a thousand words.

VICE CHAIR MILLER: Okay. Should we go to, then go to the -- and what I was going to say is, I'm hoping that -- we right now, have two hours left in this session. I don't think the location discussion, or the next upcoming meeting discussion will take very long.

And then we have, essentially, the Planning and Engagement Working Group, we don't really have anything else to report out, besides the three papers. So that would leave the Technology Working Group and the Arctic Working Group.

Ed and Lawson, how long do you think you're going to need?

MEMBER SAADE: I need 15, 20 minutes.

VICE CHAIR MILLER: Okay. Lawson?

MEMBER BRIGHAM: I'll probably need 5 or 6 minutes.

VICE CHAIR MILLER: Okay. So we might have some time ---

MEMBER SAADE: Joyce, Joyce. We're hoping that Lindsay can link in and --

MEMBER BRIGHAM: He should be linked in.

MEMBER SAADE: And that'll be another 15, 20 minutes. I mean, he's got some interesting stuff he wants to show.

VICE CHAIR MILLER: Okay.

MEMBER SAADE: On the ship.

VICE CHAIR MILLER: I think that's good. That would give us, you guys an hour, and then we'd have a, maybe a half hour to rework, and then a final, you know, look at that paper.

MEMBER SAADE: Okay.

VICE CHAIR MILLER: So the Planning and Engagement working group was asked to come up with a list of future meeting places, and I pretty much looked at where we have been, and the upcoming schedule for the transition, and my recommendation was Seattle, because we haven't been on the West Coast in a fairly long time and, I mean, we've been on the East Coast, I think, 14 times at this point.

We have been once in Portland, and once in L.A., several times in the Gulf, this is our second time in, here, in the Great Lakes, once in Hawaii and twice in Alaska.

So my recommendation, and I passed this by the Planning and Engagement Working Group was, the next place we should go was Seattle, because we have, the West Coast has really been kind of not looked at.

And then that, I thought it would be very interesting for many members of the working group to go to UNH, and that coast, because UNH is doing such interesting things that are pertinent to our panel. And then of course, we need to go back to Silver Springs, whenever there's a new administration, type of thing.

And so we were discussing it this morning, and we don't have a clear idea why suddenly Fort Lauderdale or Florida hopped in there. And so I'd like to ask, why did we put Fort Lauderdale in there when we've been down, when we've been on that coast so many times?

MR. PROCTOR: Okay. So the main purpose of preparing this straw man proposed list of venues is exactly for this purpose, to spark

some discussion and some deliberate planning.

As many of you who have been involved in meeting planning and logistics preparation, you can well appreciate the myriad details that go into pulling something like this together. And I think we all applaud the tireless efforts that Lynne Mersfelder champions to do this.

Moments after we wrap up Thursday afternoon, all of the planning effort begins for our next meeting. What we wanted to do was develop a standing list, as a standing agenda point of order for each meeting, to review the running list of upcoming venue selection, and discuss the site selection and the key objectives and desired outcomes for the next few sessions.

So Jacksonville percolated up in discussion as a result of many considerations that floated around, one of which was a presentation that the -- I'm sorry, Fort Lauderdale percolated in discussion, in part, as a result of a presentation that the port CEO made at the American Association of Port Authorities' annual meeting, that highlighted that particular port's multi-year expansion effort and the planning that they are undertaking to gain greater intermodal efficiencies as a result of their port expansion.

And that presentation, as I heard it, seemed to square very well with the general interests that abound in this forum, as we talk about precision navigation.

Russ Proctor is not particularly wedded to Fort Lauderdale as being the next venue for HSRP. What we are trying to promote is this standing agenda item, so that we can be a bit more decisive and deliberate about where this panel wants to go and why, taking into consideration where we've been, and the many other factors.

The reason we chose, or the reason we proposed Florida in the springtime over Seattle in February was largely because of the, for climatic reasons. We felt that Seattle in the fall might be a more appropriate time of year, for travel logistics as well as for some of our after-hours field trip excursions that we all seem to enjoy so much.

So that's really the only reason that

that was proposed the way that it is. But it is in no way cast in stone, no way determined at this point. It's really as a point of discussion for your consideration, and for your deliberation.

MEMBER BRIGHAM: Yes. Lawson Brigham. When we deal with Seattle, you deal with Tacoma. So if you go to Seattle, you're not going to make the folks in Tacoma happy, and vice versa. So if we go there, we really should try to do both. It is possible. They're not physically far apart.

And, you know, there's a large container port in Tacoma, leading port in the country, one of the leading container ports, among. And Seattle is emerging with lots of cruise ships.

So there are two places, two major ports. I don't think February or March is, you know, relevant for weather. And I would think we should give some -- having not been to either of those places, ever, in the history of the HSRP, I think -- and there is, you know, I can't dismiss it, a connection to the Arctic through trade and Foss and tugs and barges and all that, and the trade relationship to Alaska is also there.

So I think it's an important place to go, if not this time, soon.

MEMBER SAADE: So I wanted to add that, as a West Coast guy, I'm acutely aware of East Coast bias, and I think it's really important -- I think it's terrible to hear that it's been 14 times on the East Coast and once or twice on the West Coast. It's illogical to me, so Seattle, or anything on the West Coast.

VICE CHAIR MILLER: Well, let me tell you, Hawaii is even more, or the Pacific. I believe the Nav Manager wanted to say -- or the Navigation Services manager.

MS. MEDLEY: Hi. Rachel Medley. I just wanted to -- Lawson, thank you for pointing that out about Port of Seattle and Port of Tacoma. Actually, this past year they entered into a partnership with one another, so it wouldn't be in -- I don't think you would find that there would be a conflict.

I think they would actually welcome having the HSRP, and also exploring the possibilities of what that means when two

separate ports sort of merge together. So I just wanted to convey that.

And then, I did have all the Nav Managers put together, at sort of a short list of topics, and that's how some of these different ports came into fruition, and if anybody is wondering what those different topics are, and in those different ports, I think we're happy to share that as well.

And Joyce, I think that's probably what you looked at, initially. And hopefully the rest of the membership has looked through those talking points of what would be possible discussion in those areas.

VICE CHAIR MILLER: Kim?

MEMBER HALL: Hi. So thank you for the explanation. I think we all are very understanding that there needs to be kind of a long thought process to where we go next. I will say, Seattle in February sucks, but Florida in July is worse. And Zika in July in Florida is really not good.

So I just thought I'd put that out there as somebody who gets to go to Florida all the time. It's something I think about. But I think the big piece here is having a discussion.

If Florida is where we're going next -- I don't -- I know that's not been decided, there's been a lot of inputs as to what next should be.

I understand where Lawson's coming from about going to Seattle, understand that with the West Coast thing, if it's a timing and weather, and a seasonal thing, I would say Florida's better in the winter.

But I would really like to have a conversation on why the three -- you know, I can appreciate that AAPA had a presentation. As I look at it -- and Sal and I have had a discussion, obviously we would love anything that highlights the cruise industry. That's our personal and job interest.

However, for the good of the panel, we don't believe that's actually the best end for us and where our concerns really are. The St. James River has a myriad of issues. There's air gap issues under the bridge there. Sorry, St. Johns, yes.

And a lot of issues that have come up for our industry where it would make more sense, from the Hydrographic Navigation Services, and what our remit, as a team, is, it'd be really interesting to hear about Port Everglades expansion. I just don't know if there's a need or a tie as directly to navigational services as Jacksonville might.

So I just wanted to -- you know, when we've started going back and forth, the group has been emailing today, explaining where Sal and I were coming from on it, that hey, sure, you want to go highlight the cruise industry in Port Everglades. Sure. I just don't know if there's a direct connect there for us when it comes to HSRP.

VICE CHAIR MILLER: Well, and we just saw cruise industry in Galveston --

MEMBER HALL: And no doubt. And Sal and I mentioned that as well.

VICE CHAIR MILLER: But the other thing I would say is, Seattle in April is absolutely beautiful. I mean, why do we need to talk February?

MEMBER HALL: That's -- it works for me, too.

MEMBER KELLY: Ed Kelly here. I'm not concerned about the weather, but if we're going to Florida, I would also chime in, Jacksonville is a more diverse port. It's more of a multi-carrier or multi-operational port.

It handles a lot of refrigerated ships and cargos. It's a big car carrier port. Handles containerization currently, not a dream, like Everglades might have. They handle cars. They handle very diverse cargos. It's a very diverse labor force.

The navigation of the St. Johns River is a little bit tricky, and there's a lot of opportunities for HSRP input regarding aids to navigation-type things. So, you know, this -- if we're going to Florida, I would also throw my hat into the Jacksonville box.

And we certainly are overdue, it would seem, for the West Coast. And if we have not been to Seattle, I would say, go up to Seattle. You know, I used to have a lot of operations in Seattle.

It's a very big, it's a very vital port. It has some very critical issues regarding restricted navigation from protected mammals and everything else out there, weather issues, military operations, extensive intermodal rail connections.

And, you know, Lawson, I heard what you said about Tacoma, but the people in Tacoma are used to coming to Seattle for meetings.

VICE CHAIR MILLER: Yes. And I think the Nav Manager out there, Rachel is -- I spoke with her, oh, a couple of years ago and she was, she was saying, oh please come to Seattle. And there are facilities there that I believe we could use. Is that not correct?

MS. MEDLEY: Yes, completely.

VICE CHAIR MILLER: So --

MS. MEDLEY: Yes.

VICE CHAIR MILLER: Lawson?

MEMBER BRIGHAM: I mean, I was aware of the potential merger. Now it's merged. But even physically, if we did execute going there, you could take a field trip to Tacoma, or you could do something else.

You can go -- actually, a Coast Guard icebreaker's sitting there, too, just as another thing to do, to keep Arctic in a visible, you know, visibility of the HSRP. But I think it's time to go to Seattle, actually.

VICE CHAIR MILLER: Is that the consensus of the group?

MEMBER LOCKHART: Yes. I agree with that.

MEMBER SHINGLEDECKER: Yes. I was going to -- I know there was some concern that we didn't get the recreational speaker we were hoping for here. We do have strong contacts in the Seattle area. The state is very engaged in boating education and boating, so I'm pretty confident we could get some good recreational representation there.

MEMBER HALL: The cruise industry's there, too.

MS. MERSFELDER-LEWIS: You will get eventually to Seattle, but whether it's February in Seattle, which is your best date right now. I'm still missing four members' schedules, so if you could please send those.

It probably will not be February, if that's the best date. It probably will not be February in Seattle. It will probably be February wherever else, and it will probably be August or September in Seattle.

VICE CHAIR MILLER: No. I don't think that should drive our -- I don't think that -- I don't think the weather should drive our --

MEMBER HALL: No. The weather's not driving it. It's our responses to her Doodle Poll that we all came back and said when we are, or are not available.

MS. MERSFELDER-LEWIS: But the weather will drive it a little bit. I'm not going to put you in a winter storm in February in Seattle where I have to worry about, you know, that kind of stuff. Nor am I going to put you in a hurricane in Florida. So yes, so it will drive it a little.

VICE CHAIR MILLER: Well then, maybe we should go to -- well, Durham's --

MEMBER KELLY: We can go to Durham any time.

VICE CHAIR MILLER: We can go to Durham anytime. And it would be worse --

(Simultaneous speaking.)

VICE CHAIR MILLER: It would be worse in Durham than in --

MEMBER KELLY: February in Durham --

(Simultaneous speaking.)

VICE CHAIR MILLER: But I just feel like we --

MEMBER KELLY: Very frankly, the weather issue has very little to do with our destination. It has with our origins. I mean, they don't get much snow in Seattle, but I'm concerned about -- or in Miami, or Florida certainly, but I could be concerned that there could be a major storm, snow storm arise in New York.

So any number of members in the northeast or in other northern climes might not be able to do it. That's a typical business thing. You know, you schedule a big meeting. The weather can be perfect at destination, but if you're trying to fly in February, you can't get out of town to get to the meeting. So February is always a concern.

MEMBER HALL: As I think Lynne's

talking about that Doodle Poll, so how we answered back about our availability, is dictating.

MEMBER PERKINS: Lynne, for the sake of clarity, can you say who hasn't done it? Because I've got like 30, I've got 30 emails in my inbox with your name on it, so --

MS. MERSFELDER-LEWIS: Two, three, four.

VICE CHAIR MILLER: And the port of origin, it doesn't matter whether it's Florida or Seattle, the port of origin is going to be the same anyway, in February, so I just don't -- you know, I -- there's --

MS. MERSFELDER-LEWIS: We're way in the weeds. Let's just talk about potential places and just leave it at that. The dates are going to come up by themselves.

RADM SMITH: I heard a pretty clear consensus for Seattle, and we'll figure out how to make that happen, for the spring meeting, and then we'll take it from there. I think we've got a Doodle Poll, so we can, we can work that, and taking into account that we have some transportation risk, I think we can live with that.

VICE CHAIR MILLER: Okay. Thank you, Admiral.

MR. BOLEDOVICH: Can I clarify that the meeting after that would be in Silver Spring, in the interest of meeting in D.C. soon after the new administration's on board?

VICE CHAIR MILLER: Well that was my original plan, but I was advised that, you know, there might not be anybody there yet. I mean -- but if we had Durham as the next one, if we had Durham as the next one, we could swap those two, if there wasn't an administration in place.

I mean, it's a question of whether, in the fall, there would be a new administration in place.

MR. BOLEDOVICH: Good point. I mean, by the fall of next year, I would sure hope we would have people, but if not, with Durham, you have a facility at the University, right? So we don't have to worry. Some of the logistics are not so severe, so it might be more flexible. So Durham and/or Silver Spring in the fall.

VICE CHAIR MILLER: In the fall, and/or Silver Spring next. And then if Jacksonville -- and then back to Jacksonville as -- if we want to go four out, I would say Seattle, and then Durham, Silver Spring interchangeably, and then Florida, Jacksonville, since it's a port of interest.

MEMBER BRIGHAM: Yes, if we go to Durham, I mean, I still like going to a port, and Durham is a university campus. So Portsmouth is not so far away --

VICE CHAIR MILLER: Yes.

MEMBER BRIGHAM: Could we -- and there's a naval base there. I mean, maybe we should do the port thing for one day, and have that public meeting there in Portsmouth, to give them their time. And that's doable, right?

(Simultaneous speaking)

VICE CHAIR MILLER: I mean, I was assuming we would do something with one of the ports up there. It was just that, I think, particularly for some of the newer members who have never been to Durham, there's a lot of interesting stuff up there.

So we have a consensus?

RADM SMITH: Yes. I see some conferring over here. We'd -- you know, I guess, do we think we can't decide now between Durham and Silver Spring, or D.C., because we don't know who's in town yet? Or do you think we can --

MR. BOLEDOVICH: Outside of the burden of the logistics of it, I think, you know, Silver Spring, optimally would follow Seattle, over Durham as an option if we'll know -- we'll know long before the spring meeting. We'll know, maybe by January, so it's tough to get a sense of how quickly this is going to happen.

Because there's a lot of talk that people are lining up their nominees. We're really ahead of the game this time around. So I think we might -- you know, I'm not -- I'm sensing it's creating a burden in the planners, and the logistics folks, but I think ideally, yes, Seattle, and then ideally, Silver Spring in the fall.

You want to be there the first opportunity, and six month is a long time in a four-year term, right? That's, you know, one-

eighth of your time, and you only get so many bites.

So from that kind of an angle, you're here to advise this administration, and as soon as they're on board, well the sooner you want to meet them. Recognizing the chair, of course, could meet informally with folks before the panel engages.

RADM SMITH: So I guess I'm hearing that D.C. would be the preferred next one, right?

VICE CHAIR MILLER: Yes. I think so.

RADM SMITH: And we could pull the plug on that a few months in advance, if necessary, if we thought it wasn't going to work out for some reason.

VICE CHAIR MILLER: Well, and since --

RADM SMITH: And go to Durham.

VICE CHAIR MILLER: Since UNH has facilities that we know we can use, and we know the logistics up there petty well. I mean, that's one of the less complicated, probably, places to go that we would have, I would think.

DR. MAYER: You just have to reserve parking right now.

(Laughter.)

VICE CHAIR MILLER: We'll reserve it for both times then.

(Laughter.)

VICE CHAIR MILLER: So I think that's it. Dave, anything else on the P&E?

MEMBER MAUNE: Nothing else. We have our next three or four papers lined up for the issue papers for next spring, so glad for all the volunteers.

CHAIR HANSON: Well done.

MR. EDWING: So just quickly going back to the PORTS paper, we were able to locate the graphic that, I think, meets what you're asking for. First thing I'm going to day is, you know, right now, while the PORTS system has continued to expand, it's doing so in a non-strategic fashion.

It's whoever has money, whether it's a small port or big port, comes up, gets in line, and gets a PORT established. So this, what this graphic does is it kind of, it has three dots, by size of PORTS.

The smaller dot -- and one, another

thing, too, is a capital PORTS can service more than one seaport, okay. So the smaller dots, which are -- and you can't see the -- you know, smaller dots service one to two seaports, the medium sized dots, two to four, larger dots, four plus.

If it's a green dot, as far as we know, that PORT has pretty much all the sensors it needs. If it's yellow, it means that we know -- and this is mainly through Darren talking with the customers, that they want more sensors, but they don't have the funding, or whatever reason that, you know, those -- they want more sensors but don't have them.

And if it's a red dot, it means there's no PORTS established. And the red dots are really based upon our internal strategic planning of -- for a fully-funded federal system. And we based that upon the top 175 seaports by tonnage, with some other factor thrown in there.

That's our internal definition. People can quibble with that, that's fine. But we had, you know, we had to do something to try to come up with the cost estimates.

So that's what this graphic was put together to illustrate. And you can't see all of it, because the screen's not allowing it. Kind of in the left hand corner is Alaska, so Lawson doesn't feel left out, and just to make sure -- and yes. And -- yes.

So I think this probably is very close to what you're looking for, but I will say, you're not -- you know, if you shrink this down to try and fit on a -- this is really a full-page sort of graphic. Now maybe it's an attachment to that, you know --

(Off microphone comment)

MR. EDWING: Screen it in the background? We could try that.

MEMBER KELLY: Let us play with this graphic, and we can -- we have space in there already for an existing graphic.

MR. EDWING: Right.

MEMBER KELLY: And maybe we just blow that out, push some of the text down a little bit. We do have a little bit of flex room in the bottom. Let us try this out. This is kind of the graph that says what we want it to say.

MR. EDWING: Right. Right.
MEMBER KELLY: And again, we have to look at the audience we're sending it to.
MR. EDWING: Right.
MEMBER KELLY: We would trust that the administrator would also have the NOAA document, and have a --
MR. EDWING: Right.
MEMBER KELLY: -- bigger picture, if they wanted that, or wanted a bigger graphic, we could supply that.
MR. EDWING: Right.
MEMBER KELLY: But to fit on the two-page, I think it's important we try to get this graphic into the format of the letter itself.
MR. EDWING: Okay. Okay. This is --
MEMBER KELLY: We'll try it. I mean, you know --
MR. EDWING: This is a PDF. I'll get you the PowerPoint version, which will probably be easier, or some other format easier to work with.
MEMBER KELLY: If this blows out a little more, we can --
MEMBER HALL: We'll just buy a, you know, get a microphone, or a magnifying glass to go along with this one for the -- sure, yes.
MEMBER HALL: I'm sure there's some money for that, right Lynne? We can do that?
MR. BOLEDOVICH: One other question is, if you're going to shrink it down, this is trying to convey about four or five messages. Maybe dumb it down a little; where do we have PORTS, where do we still need them? Instead of, this is getting pretty complicated in terms of all the different things you're trying to communicate.
(Simultaneous speaking.)
MEMBER HALL: Well I think you still can do a regional area and just say, this is one example. We're not favoring any one or the other, but here's one where there's a high concentration of what already exists but even a high concentration of what is needed.
So that might be the northeast, and a star on the East Coast here is proving that we need more. But that might be just for the -- again, it's a visual aid. Again, it's not the

whole story. This is supposed to lead to more thinking on this, and more action.

MEMBER MAUNE: I think we should do what Ed's trying to do, see if he can get that to fit. I'd rather try to get as many congressmen involved as possible, to see what they don't have in their territory that they need.

MS. MERSFELDER-LEWIS: I think if you guys just put where there's not a PORT, that catches people.

MEMBER HALL: No, because we still have problems with where PORTS actually is, as part of this paper, that it's not being funded where it actually already exists. So I think we'd be remiss to do just that. But thanks, Lynne, for that feedback.

MEMBER KELLY: I think this is the graphic we want. It just is how it will display in the small amount of space we'll be able to give it. So we'll try it. We'll see how it looks. We'll pass it around, if you can get us anything with this, and we'll see what it looks like.

VICE CHAIR MILLER: Actually, I heard somebody, maybe it was Ed, say perhaps, you know, sometimes it's very effective to fade in the big figure you need in, in the background, and put your text over that. But that takes somebody who's much better at graphics than I am.

MEMBER KELLY: The layout's wrong, too.

VICE CHAIR MILLER: Yes. I think we're ready for -- it's 4 o'clock, and so we have an hour and a half.

Lawson?

MEMBER BRIGHAM: Mine's a little shorter. I think Ed deferred to me to go first. Is that okay? And he's got --

VICE CHAIR MILLER: Works for me.

MEMBER BRIGHAM: -- the rest of the rest of the time in technology. Okay, great.

It's Lawson Brigham, "Report on the Arctic Emerging -- Emerging Arctic Priorities Working Group" is the formal title.

Just to recap a little bit for the audience, we -- in L.A., in April of 2015, NOS staff provided us six major and difficult questions to answer, and to assist them in, about

priorities of charting hydrography in the United States Maritime Arctic and a series of issues.

So we answered the mail all summer. We worked on it, the working group. And I reported out on behalf of the working group to the HSRP last September. And we reached consensus, I think, among the HSRP members, to send this report, the Report of the HSRP Emerging Arctic Priorities Working Group. And we sent it up to the Administrator.

The intent was just to make sure she saw that there was output from a working group. And our letter came back from the Administrator, and of course, it didn't address these issues, and we didn't intend that she would address each individual issue.

So there still is a little gap here, on having engagement with the NOAA staff or the NOS staff. And so what I would propose is that we actually have a Arctic working group meeting. I'll draft up with the working group members the issues to discuss that relate to the report we had. And then we'll have a teleconference and a discussion about those issues.

One issue is this, is the 500 square kilometer, or nautical mile, annual output in the Arctic. Is that real or useful? Or is it too low, or could it be higher? We just made a judgment call on that. So we could discuss that more.

Another issue that certainly we should talk about is the changing U.S. Maritime Arctic. There isn't offshore development, but there is emerging corridor exercise. The Coast Guard calls it PARS. But it's not necessarily port access, because there aren't any ports. It's a fairway kind of roads through the U.S. Maritime Arctic.

But they're going to continue it around the Chukchi Sea and the Beaufort Sea. And really, we have minimal reference points there, and no tied, combined Corps sites. So yet we're going to put a highway around there, in some sense. And so that's another issue to discuss.

And so I think a teleconference of working group, and selected members of the NOS staff, that we could discuss follow-up of this report. We could do it with the whole HSRP, but

maybe we just have a meeting, and then report out to the next HSRP meeting.

The second action might be, once Ed, you get your technology group geared up, maybe we could have a joint working group meeting on technology, and how it might impact future of surveying, you know, in the Arctic. Are there new and novel tools there?

And then the third action might be to provide some input to the IHO, through the Arctic Regional Hydrographic Commission. There are some issues, I think, that some of us know about, that maybe we could provide you, Admiral, when you go to IHO, to -- for the commission.

I'll just report that I think the fact sheet that we have is very useful. I've sent it out to hundreds of people. I get some feedback that it's easily read, it's useful. I've blanketed my network in the Arctic community, and a lot of researchers, of course.

And they like it too, because -- and a lot of people do focus on the 4.7 percent charted, is a number that we, that Admiral Glang and the team put together for us, that is the, how much of the U.S. Arctic is charted to modern and international standards, which, of course, the place is maybe half charted or more, but maybe not to international standards.

But so, but yesterday, of course, you saw that we were discussing 1 percent. But I think it's -- there's some inconsistency in the numbers. But the fact sheet is very useful for my community.

And just one more item to report. On the 1st of January of 2017, this new IMO Polar Code for ships operating in polar waters, Arctic and Antarctic, goes into force. It's a seminal new regime for the Arctic. It's designed to enhance safety and protection.

And it does have some relevance, of course, to hydrography and charting, because it has boundaries. And so, I think, the challenge is for the United States Coast Guard to implement this, because there are no special -- today, there are no special Arctic rules and regulations for ships in the United States Maritime market.

There are in the Canadian Arctic, the Russian Arctic. But no -- other than SOLAS and

the MARPOL, for the global ocean. So that's a new and novel -- and being on the U.S. delegation to the IMO for negotiating this code, I think there were some unintended consequences that relate to hydrography that haven't sorted yet, but we'll probably hear about them after the Polar Code is in effect.

What it will impact -- although government ships, of course, are not under the IMO regulations, surely new Coast Guard ice breakers and new hydrographic ships will have to be -- that they're operating in Arctic waters, will have to be built to Polar Code standards, which will be, probably increase the cost of the ships, et cetera.

But for the government not to adhere to pollution regulations and discharge and emission regulations that come with the Polar Code, would probably not be appropriate.

But anyway, we have a fair amount going on. I think we'll gear up to have a teleconference with some of your staff, Admiral, and review this, and maybe update this report we had.

RADM SMITH: Yes. I just wanted to clarify. I mean, I think we all know, but just to keep our language straight, that it's 100 percent charted, right. There's a piece of paper that covers that area. It's the survey that we're talking about.

But it's very easy to slip that language in just to be clear when we talk to the stakeholders and decision makers and stuff.

(Laughter.)

CHAIR HANSON: All right. Thanks, Lawson, as always. Appreciate it.

Yes sir?

MEMBER SAADE: Do I just push it up? So we're just getting started, so we're going to walk you through what we've been able to do since we all got together back in March, as a background. And then, well a couple of ideas that we've come up with, and how we've narrowed down the focus, because it was a pretty big focus when we got started.

So I think Lindsay's listening in from the vessel, but we'll find out in a little bit. At the tail end of this, we're going to try and

do a technology demonstration from Lindsay on the vessel.

So April through August, we took some time to look at all the options. It was, for me, personally like, it was like a kid in a candy store, because there were so many different types of things that we could do with technology.

We -- I personally got carried away with this big long list of really cool things that the folks at UNH were doing in the -- and NOAA itself had a very well thought out, extensive, detailed list of a variety of technologies, ranging anywhere from data acquisition to data processing, and ping to chart, everything along the way that makes for what we're trying to do here with getting a sounding on a chart.

And that, we took a little bit of time to look into all that, and decide, how do we weed through this, and how do we select which ones are worth advocating for, or what can HSRP do to add to that.

So we went through the matrix list that was available, made available to us from Neil, and tried to do our own questions, internally, in terms of what's a priority, what should we chase after.

And then we kind of realized that we were getting too far down into the weeds. We were -- as far as what the panel can actually influence, what the panel can recommend, we were looking too -- we felt we were looking too specific for a bunch of different technologies.

So that led us to back away and start to think about the bigger picture ideas, and what can we do relative to technology as HSRP in a much bigger picture.

So we then started to focus on some significant R&D programs that are both for NOAA and also that what we think is in the broader industry. So that put us on a different track.

So I'll give you a couple of examples of what came up. We talked about a couple of ideas. We did a round table discussion. We were up at, in, at the UNH, about a month ago, with a couple of big-picture ideas.

One of the ideas that came up was, during the discussion was, how do we take all

this data from, that NOAA has, and present it out there that people care about, something like what the Weather Channel is able to do?

So we haven't done much of that, but that was one idea of where we should go with this, as a big picture idea. How do we advocate for something that we can take the data, and make it very accessible to the masses?

Another idea that came up is what's up on the screen there, is types of things that were developed under the NOAA charting activity, and specifically at the UNH. And that one in particular was the whole idea of bathymetry combined with backscatter, and now combined with water column detection, or water column seeps.

And that, for everybody's benefit, that's really taking off in industry. There's a huge surge of applications of the type of things that were invented within this group, or within this broader NOAA group, that have now been applied to deep water mapping for hydrocarbon seeps throughout the world, but particularly here in the Americas and particularly in the Gulf of Mexico right now.

So that led to trying to get a handle on, maybe we should talk about cost benefit analysis on how these types of things, these inventions, these technologies are really benefitting the greater industry, and that leads to a discussion on advocating for technology advances, and a means to go back to advocating for NOAA hydrographic charting in general, because it's not just about pings on a chart, it's about this technology transfer that really benefits the, a number of industries, and benefits greatly a number of industries when you're, when you start to talk about $70 million a year, or $100 million a year.

And it's growing right now. And that doesn't even include the impact of whether these things really lead to oil discoveries, which can be in the billions of dollars a year.

So those type of technologies, we felt, might be really a better focus for us to write white papers on, to try and advocate for.

And then there's other possibilities with, just with this data set, that, you know, it's not all just about the oil and gas industry.

There's all types of other impacts from studying this or using this massive database to investigate what maybe it has to deal with methane release into the water column on a massive scale that nobody realized, or we don't believe that scientists yet realize that there's that amount of material naturally going into the water.

Geohazards, environmental baseline studies, habitat studies, habitat studies for fisheries, again, all on a grand scale, and all because of the roots of what has been developed within, originally within NOAA and the R&D projects over at New Hampshire.

So we kept on our information gathering missions. We set up a couple of webinars during the monthly meetings. We had a variety of different topics on the issue papers, to try to continue to see what was going to stick, or what really resonated with everybody.

We had the requested briefs on the Port of Long Beach prototype project, as you can see there. There was a really interesting discussion on the next generation vessel design for NOAA, and should you have regular old launches or should you have launches of the future that might be all autonomous in nature?

I thought that was a really, a good challenge to the group, to decide what is the next generation NOAA vessel, as far as the way it's going to collect data.

We had a couple of other ideas for proposed future briefs with data management, and again, that idea of a web-based system that resonates with the public as, on the same level that the Weather Channel is. Chart production overview and plans, other ideas that maybe will come up here.

And that also, that with the point on the back there, another item that came up with internal discussions that I was having with people, was -- well let's do this one first.

The outputs -- issue papers on values of transfers, so we're going to always try and do a cost benefit analysis on this, either with the facts that we have in hand, or do the best we can to project that, to have a better justification on what kind of types of technologies we want to

advocate for.

And then we recommend further analysis of, to complete the work flow, metrics to better identify issues to prioritize it. And again, that's a lot -- we bit off a lot more than we can chew, to say. And we're still trying to get a handle on all that.

The third bullet there is something that came up, that I haven't even presented previous to this meeting, and that was the idea that we're talking about, the Maritime Transport System, and it was mentioned a little bit earlier, and comparing that to civil aviation types of funding and civil aviation types of strategy on how we approach that.

So I have another presentation that I'll distribute later on, but this is an interesting graphic to show you, to show everyone how complex it can be, relative to what we all know is up in the air, flying around, going in and out of JFK.

And the image on the left is the height of all the vessels that were involved in the Macondo oil spill, in trying to manage all of the activity there.

In line with the admiral's pyramid of SOLAS and non-SOLAS and recreational vessels, and the constantly growing number of vessels, you can compare that, maybe, to the aviation industry, where you have, oh, say ten A-380 landings and departures at JFK, and 20 general landing aviations and departures, and helicopters landing, and 150,000 passengers, and 90 individual airlines.

The point being, the aviation business, or the aviation industry, whatever you want to call it, who gets $15 billion a year, has a very accepted methodology about how they manage all these aircraft and all these different sizes of aircraft.

And we're starting to talk about, how do you manage these super ships and smaller ships, and the ins and out of PORTS. It seems like there's a lot of parallels on the way the ports are, might be looked at, similar to the way the aviation business is looked at, in the management and the control and that sort of thing, and again, leading towards funding.

So that's just, again, something to throw out there to get people to think. But that kind of summarizes where we're at right now. And again, we haven't latched on to any one single topic that we want to advocate for yet, but there is a big, wonderful bunch of ideas and activity there.

VICE CHAIR MILLER: I like the idea of the launches, or looking at the launch. You know, I've been thinking of things like, well could you provide us sort of davits or launching system, I won't say davit system, that could launch either a launch or --

MEMBER SAADE: An ASV.

VICE CHAIR MILLER: -- an ASV of some sort. Or, you know, do you need a launch to tend an ASV, or whatever. But, you know, some sort of modularized launching system that you could, you know, that you could implement, that you'd have flexibility. Because we don't know what's coming.

MR. DEBOW: That does exist already.

VICE CHAIR MILLER: Does it?

MR. DEBOW: Vest has a system like that already.

RADM SMITH: I would love to have an opportunity to brief you all on, not only on our unmanned systems activities, but on our thinking as well, so that we can --

MEMBER SAADE: And maybe that it's, ties it all together.

RADM SMITH: At least baseline, where we think we are, and where we think we're going, and what kind of irons we have in the fire, so that we don't march off in two different directions on this one.

MEMBER SAADE: I think that's a great idea.

VICE CHAIR MILLER: Yes. I would agree. The other thing, Ed, that I had been -- the other thing I had been hoping maybe that the Technology Working Group could give us is, you know, I'm not very much in touch with the state of the art in LIDAR or, you know, or many of the more modern, you know, the -- and I just thought maybe the technology group could provide some internal information for, particularly for those of us who have either been out, or like, I don't

know that much about LIDAR.

And Dave and Gary were talking, and said, oh it changes every week. Well, you know, I think it would be useful for us to have a, at least a broad understanding of what those technologies are. And that's not necessarily a paper, but maybe you guys could provide --

MEMBER SAADE: Well, if you're leaning towards, we should have some technology briefings at every meeting, I think that'd be great. That'd be relatively easy to set up. It'd be very informative. We can keep it on the leading edge at all times.

Amongst the group that's in this room, there's plenty of really qualified people, you know, and Carol and the others, that are even on our little working group.

If we want to start to begin to do that, I'd rather do it in this kind of a forum than on the webinar, to be honest with you, because I think the interaction and the quality of the images and all that are a lot -- people get a lot more out of it.

VICE CHAIR MILLER: Well, and it also provides information to our stakeholders who attend meetings --

MEMBER SAADE: Good point, yes.

VICE CHAIR MILLER: -- who might not be up. So --

MEMBER SAADE: Yes.

VICE CHAIR MILLER: So, I mean, and that would be -- I mean, you don't have to focus on what huge topic are we going to undertake. You could say well, you know, we're going to give a seminar on this.

And because you guys are the ones that are in touch with the modern tech, or you know, the most modern technology -- and it, you know, it would give you guys kind of a product that helps us all, and without, you know, a huge amount of effort. So --

MEMBER SAADE: Yes.

VICE CHAIR MILLER: -- that would just be my request.

MEMBER LOCKHART: I think it was the last meeting or the meeting before, Scott asked if, at some point, I would give a presentation on LIDAR. And so I'm going to volunteer to do that

at our next meeting, if you're interested.
MEMBER SAADE: Let's start with LIDAR, you know, at the -- in Seattle.
MEMBER LOCKHART: Exactly. I have a data set from there we can use.
MEMBER MAUNE: Somebody this morning mentioned ground-penetrating LIDAR. I've never heard of that.
MEMBER SAADE: No, no. That's a --
MEMBER MAUNE: We use ground-penetrating RADAR, but I've never heard of ground-penetrating LIDAR.
MEMBER SAADE: That's how fast the technology's changing, right, and right in front of us.
VICE CHAIR MILLER: So is Lindsay on, do we know?
MEMBER SAADE: Do we know if Lindsay's on, Larry?
MEMBER GEE: Thanks, Joyce. Yes.
MEMBER SAADE: Oh.
VICE CHAIR MILLER: Oh.
MEMBER GEE: Yes. I'm on the line, if you can hear me.
MEMBER SAADE: There's a voice. Go ahead.
MEMBER GEE: Yes, hi. This is Lindsay Gee, an almost member of the HSRP. Maybe I'll eventually get to a meeting where I get sworn in.
So can you hear me all right, okay?
MEMBER SAADE: We hear you well, and we can see the screen.
MEMBER GEE: Okay. So there's a, is there a Nautilus Live quad screen up, with four separate images?
MEMBER SAADE: Yes.
MEMBER GEE: Okay. Thanks very much, just for the time. And really to follow on from what Ed said, I thought I'd take the opportunity. We do get down to the weeds sometime, and I thought it'd be an opportunity to show maybe some of the other members that haven't had a chance to see what some of us do.
And also, as kind of exposing a couple of pieces of technology that we've already discussed, one in particular with the seeps that Ed talked about, and the other is just, is a telepresence.

Where I'm calling from is the exploration vessel, the Nautilus. This is Dr. Bob Ballard's vessel in the, part of the Ocean Exploration Trust, and that Larry can give you more briefings on that, out of this session, but I had the opportunity to come onboard and be part of this expedition.

And we're off -- if you see the map that's then up in the, I don't know, the top left, I think. This is off the Cascadia, it's on the Cascadia margin, off the Oregon coast. And the lines you're seeing are the areas we're going to be surveying.

So this area in the middle that's colored by the depth is one that was done earlier, in an earlier expedition. And the black lines are what we're currently surveying. We're actually up in the northwest, I think, on the -- yes, on the bottom left screen is a navigation screen. They're on this line coming down here.

One of the points to make now is the way we're doing this, and what you're seeing is on the web page, is a reduced set of four screens that -- and one thing that Dr. Ballard sort of, I guess, was a pioneer of in the research community is what he calls telepresence, which is being able to, you know, broadcast.

But it's not just broadcast ashore and both ways for, as opposed to research and outreach. But the whole thing really, is to be able to engage more people, whether that's other scientists or even just general public, for the outreach.

And so you're seeing a lot of resolution in our web page, where you're seeing each screen. But if, in other centers, like his operations center and, at the Inner Space Center at the University of Rhode Island, all right.

And Larry and Andy up at CCOM/JHC at UNH, they have another van that looks -- oh, you're not seeing the control van, but those monitors reach a high resolution screen, so they can see what we're seeing now.

Or if they are then exploring with an ROV, you can see the actual ROV dive. So this allows a much bigger science team that you can get on the vessel to be involved in the expedition.

How does that relate to the HSRP, and the technology group? I think this is one area where we hear continually, I think, from NOAA, that they have trouble with resources and people, whether that's even getting them in the first place, or having the right level of expertise out on the ships and in different areas.

And telepresence, people would say, oh communications is difficult and it costs a lot of money. But in the scheme of things, it's a cost benefit analysis of that, it's not an expensive way to get really powerful and extensive expertise into the areas you need it onto a ship.

So after I've done this, I'll probably have Larry telling me what I'm doing wrong on the sonar or something like that. But what -- oh sorry, what I didn't describe, apart from that map on the left, on the top right, what you're seeing, is the Kongsberg sonar, and this is the sonar that's laying control.

So as we're mapping, we're in like 1,270 meters, and we're on a survey that's again, looking -- it's primary on the Cascadia margin, which they've found many seeps.

And so in the, earlier in the year, they were expecting to come up and find a few, maybe 10 or 20, something like that. And then they've found over 500, so what Ed was talking about earlier with the seep and the research that's happening, it's kind of continuing to grow as we go.

So going back to the telepresence, it allows you to get the researchers off shore, or even take some of them maybe off the ship. And as an example of that, a NOAA ship, Okeanos Explorer, is also currently doing a survey right now with telepresence.

And the lead mapper on that is sitting in the lab at UNH, controlling that survey. So she has a team onboard the ship, but they're using the telepresence. Even in that role now, it's being done.

And I think, with communications, as it improves, there's -- let's see, we're going to see it as part of the general use offshore. I think it's going to become more and more, and that's something I would, just wanted to demonstrate. But when we talk about telepresence

or what it is, from the technology group, you'll know what that is.

It's also related -- I think you were just discussing briefly about unmanned and USVs, and how you get things off into remote areas, and particularly, the Arctic. I think that's an area where, if you are going to put up unmanned, you know, vessels and all those things, not only can you telepresence into something that has people on board, but you could set it up so you could telepresence and control remotely without.

So it's unmanned, mostly autonomous, but if you need to, you can get onboard and look like we're looking at these screens now, to see progress on the survey.

The second thing, really, was seeps, and I was just going to -- maybe we'll see one pop up on the sonar as it comes to you. But I was going to just talk in, the seeps in a couple of things, and how it's, went very quickly, in fact, from research through operations, and really to a value-add that Ed's talked about.

And I think this really, to try and strengthen the support that's provided to the research institutions like CCOM and others, it's important but to have in mind, not just a research, and not just solving NOAA's problems of being able to, whatever that is, and when they define their priorities, but I think we've always got to consider more than the potential that's a value-add, that -- and have a -- we don't know what that's going to be, when it's researcher-started, but I think we have to have a process that allows that to be done easily.

So let me just change screens here a bit. So last night, in fact -- and I'll stop there, last night we were up in -- let me just show you where that was again, if I zoom in a bit.

We were up, coming up in an area that had been mapped previously with, NOAA PMEL was on board, on the expedition earlier in the year. And they mapped this area, and the black dots are where they found areas of seeps.

Well last night, we came along this line here, and then this morning, we just got up and said, oh well, let's have a look at it. And they didn't see anything online when they were

doing the survey, when they were on watch.

So we had a look at that line, and you see this little curve here, and let's have a look what we found there. And so this is just the normal -- turn that off for a sec, this is the normal bathymetry that you would see, after you mapped it, similar to the one on the main screen.

We also do map the backscatter, which is the intensity from the sonar, to try and determine the type of seabed, or the changes in the seabed down there. And we can turn that on.

And you'll see the grayscale is indicating the different variations in the seabed, so a stronger return from the lighter areas and then less in the dark. So we can review that area. We'll drape that over the bathymetry so it's still evident from that.

So if you then also see the fan that's in the bottom of the other display, that's all that the user normally has to look at, so that's really complicated. Now if you miss it, when the sonar pings, and you don't miss, get the seep, it's gone by the time you come back.

So this was some development that was done a number of years ago in collaboration with, I think it's CCOM and JHC. And now you can put this into the -- out of the analysis software, and we can bring it into the scene.

And now this is replaying some of that, and you can see the variations in the, some things in the water column. But you see all the noise.

And so, years and -- for years and years, we all mapped the seabed and weren't interested in the noise, but then there was a while ago where someone got interested in the noise. And so it's the story about, you know, one man's noise is another man's signal. And so we came, and then this has been a real focus.

So getting rid of all that noise and actually extracting something was some of the research, and it's still ongoing at CCOM. And from that, what we're able to do is then extract areas where there are actually seeps.

And this is one that was -- if I scroll along to that. Let me just do that. I'll tell you exactly when that was done last night. So if you scroll along here, turn that on. So

that was about, yes. So that was last night. This is GMT time, so it's 15:30 today, GMT, that that was, that seep was found.

So this was -- again, if you take it back to telepresence, it's not where we end our 15-day cruise and then we come back and process, the data gets processed our way, traditionally.

Either Nicole Reynolds has already sent this back to the scientists ashore. And so they're seeing this, you know, almost immediately, or within the hour of it being found.

So I think this came -- and it's interesting, I think, in the room there, and with Nautilus calling in, everybody that's been involved with this development is kind of, you know, in some way, is -- it came out of CCOM and JHC.

I was involved in some of the -- with the company I was at previously, in developing the software, that in the commercial tools, and Nautilus was certainly involved very early on in all the research cruisers that use the software.

And then it's gone through into that as Ed talks about his company, that's been using this in a true commercial role that I'm sure the researchers eventually never thought of.

And this happened in less than ten years. So I think -- and it was, part of it was the Naval, so that we could do it within -- Larry and the center there had set up an industrial partnership that allowed the technology to be transferred to operations and spun out. And I think there's more to be done on that.

And back to my view, I guess I've expressed and you're probably sick of hearing it, in some of the other papers and meetings, when I send email. My view is, I think we -- you know, that we advocate for federal money for different things, and that will solve a problem. You know, it -- industry gets involved in that.

But I think we've also got to be very cognizant now. It's always value-add. And I think that's important, to make sure that when that federal money gets, you know, used for whether it's research or surveys or those sort of things, it's got to be mechanisms that you can provide a value-add.

Ed is talking about, for this initial research, whatever until Larry could, in the time that's sent, could let you know that, this is, has potential in, right now, in his industry is saying that, I think, Ed has said $7,500 million, and potentially, if it assists in finding, you know, oil and gas, it can be a huge amount.

So I just wanted to just summarize a couple of things, the telepresence, I think, and the big development, so you've seen that. And also see how that -- and also how that's gone out into industry, and actually added value to what we can do, and add value to the nation, really.

So that's short, and hopefully that was interesting.

MEMBER SAADE: That was great. Thanks a lot.

MEMBER GEE: And any questions, do please.

MEMBER SAADE: Any questions anywhere? Well I think you wowed them, and I think we just demonstrated our first technical presentation at -- we don't have to wait till the next one. So we've kicked it off in a really strong way.

So thanks a lot, Lindsay. And I guess we'll move on to whatever's next, if there's no more questions.

MEMBER GEE: Okay. Thanks Ed, and I'll sign off and stop using the Nautilus satellite. Thanks very much, everyone.

MEMBER SAADE: Hey wait, wait. Wait, we got one question.

MEMBER GEE: Great. Okay.

MEMBER SAADE: Oh well, never mind. You're free to go. You're free to go. Thanks a lot, Lindsay.

MEMBER GEE: Okay. Thanks very much. Bye.

MEMBER LOCKHART: I guess I just wanted to make the comment that in these Technology Working Group meetings we've been having, we've been having some pretty robust discussions, and asking some pretty hard questions, I think, of some of the folks that have been giving those presentations.

And I wanted to highlight, again, I know you had kind of three main items that came out of that, but the thing that kept occurring to

me throughout all of those presentations we were getting is the second item you had there, which is -- you know, it -- we're a technology working group, and technology's important if it fixes a problem, but we don't want to be using technology for technology's sake.

And the only way we can figure out if we're applying the correct technology is to know if it's actually going to improve something or not. And the only way we know if we improve it is if we know what we're already doing now.

And so I think, you already highlighted that doing some kind of baseline analysis on your current workflow process, and getting those metrics, so you know where the problems really are, I think, is really important.

I know it sounds like that's kind of being sort of done in some places, kind of not done in other places. But I think having an end-to-end better idea of what's going on there is important.

Because having done this on multiple different work flows before, some that I've been really in-depth involved with, others that were completely fresh to me when I went to do the analysis, you may think you're spending a lot of time in one area, and it turns out that the problem is actually completely somewhere else.

So I think doing that analysis, and then being able to drive if it's a software problem, or a hardware problem, or a user problem, I think, is good. And I think processing, a lot of times, gets forgotten, but I think there's a lot of bang for the buck to be had there.

MEMBER SAADE: And I would add that we've -- you're right that we've had some really good discussions. And I don't think we do a good job of capturing and recording all that was discussed, and what was concluded.

RADM SMITH: Yes, I'd -- since we've decided to go to Seattle, that's where, that is where one of our processing centers is. And so this might be a good topic for us to take on for next time.

And the other thing I wanted to reflect back on one of the things that Ed said,

so that it doesn't get lost, is that, is really about making good use of the data that we have.

And there's not very much we can do in the government to change the amount of money we get. It, you know, doesn't change that much, year to year. What we can do, and really, I think it's, you know, what I consider one of biggest duties, is to increase the value of the investment that the public has made in our programs.

And so, you know, going all the way to the end to the societal value, so you know, if we're all, you know, buns up, working on some little widget down in the works, you know, maybe that's not the best value, the best effort.

And this is not something, I think, that we in Coast Survey do well, or in NOAA, frankly, to, you know, take it all the way to delivering the best societal value.

I come back to the models, which is, you know, we have these great operational forecast models, most of which go to other modelers. And we saw the very first example I've ever seen of somebody using it in any navigational context, and yet that is why we say -- that's what we say we do them for, right.

And so there's a -- you know, I think there's -- and the same is true for, you know, boy these bags we've been making now for 15 years, surely somebody's going to love those. Surely they're going to make it into the navigation systems that all the fishermen are using. Surely -- and they're not.

And maybe it's because there isn't an application there, and maybe it's because they don't know, or because it's too complicated, because it's really a lot of data.

But so anyway, I would, I guess I would challenge the technology group not to stop at, you know -- not to focus solely on doing hydro better, because I think that's sole -- that's squarely in the space that most of us are very comfortable operating, but to go all the way to that societal benefit. And there's technology out there, too.

VICE CHAIR MILLER: Okay. I'm aware that -- how many are leaving tomorrow morning? So, okay. It's not on the schedule, but because

these guys are leaving tomorrow morning, I think we should have a recap of what we've heard, and what our major issues might be for our recommendation letter.

And I've been taking notes and kind of trying to summarize. And I just sent Lynne -- or I just -- yes, I just sent Lynne, a one -- it's a little over a page, with -- and what I tried to do, so that we have some general topics, is to put all the comments we've heard up, or any issues we've had come up, and add the comments.

This isn't necessarily what we're going to say in the letter, but it's what we've heard this time. And Lynne, whenever we can get that up, it would be good.

(Pause.)

And I have to say, thank you very much, Lynne, for coordinating all the files that are flying back and forth.

PARTICIPANT: How quickly are we going to get the letter out?

VICE CHAIR MILLER: What?

PARTICIPANT: How quickly are we going to get the letter out?

VICE CHAIR MILLER: ASAP. Well, I'm going to be, I'm going to be at my sister's house, but I can work there. That's obvious.

Okay. So I've -- what I do is I just take all the comments we've gotten and pile them under -- yes. So there's four or five basic topics that I've heard. So there were some Great Lakes specific recommendations, like they should receive the same attention as other coasts.

And I'd like to say to those of you in the audience, if you think you're neglected, come visit Hawaii.

(Laughter.)

RADM SMITH: Somehow it's hard to have sympathy. It just doesn't work.

(Laughter.)

VICE CHAIR MILLER: Make sure that the funding does not --

(Laughter.)

VICE CHAIR MILLER: I think the Admiral said something about a pity party.

(Laughter.)

VICE CHAIR MILLER: And that NOAA should have a stronger Near Shore program in the

Great Lakes.

Let's take a quick look through. So communications, we've heard a number of comments about communications. Just page down to the major topics, and then we'll come back and discuss each one of them.

So partnerships, heard a lot about that. PORTS and water level sensors, mapping needs, and then some miscellaneous other comments that I didn't think fit anywhere else. And these are mostly the people, the asks we've heard, you know, what can NOAA do better.

We generally try to have three major topics for the recommendation letter. Four is not unknown, but more than that -- and some of this information, we can put in the text as a comment or, you know, an observation, and not a recommendation.

So on the high level, communications, partnerships, PORTS and bathymetry are the four areas I saw. And so I'd like to stop there for a minute, and see if there's agreement there or not.

MEMBER SHINGLEDECKER: I would say it's a good start. There was one thing that I heard that I haven't really heard anybody discussing much on the sidelines, and I'm not sure if it's really our jurisdiction or not, so feel free to dismiss it.

But I was hearing, definitely, from the Army Corps, of infrastructure needs, and the aging breakwaters and the discussion of the situation with the locks. And while those certainly seem like Army Corps matters to me, they certainly seem to be imperative to the successful navigation and commerce of the Great Lakes.

So I didn't know if we wanted to include that anywhere in there. But I just thought I'd throw it out for discussion.

VICE CHAIR MILLER: Anyone from ex-Army Corps, or --

MEMBER MAUNE: Well the gentleman that briefed us as we entered the boat yesterday afternoon, he gave us quite a briefing on what would happen if some of these locks -- he said they'd been working on repairing that one lock since 1986, and it keeps getting worse and worse,

and all this horrible stuff that would happen.
I don't know if, who else heard that, or listened to him, but he gave us an earful on that.
VICE CHAIR MILLER: Yes. I'm not sure -- I agree with you. It's an important issue, but it's not really NOAA-specific at all, I don't think.
Brigham, or Lawson?
MEMBER BRIGHAM: Lawson Brigham. Somewhere on your list -- I stepped out for a second. Is observing and observations on there somewhere?
VICE CHAIR MILLER: Oh yes. Yes.
MEMBER BRIGHAM: Okay. So later on?
VICE CHAIR MILLER: Yes. I -- we're just discussing sort of the broad issues. So why don't we go to -- in the Great Lakes recommendations, I think we can discuss, this is what we heard from the Great Lakes. They would like -- you know, that doesn't have to be a strong formal recommendation from us.
Let's go down and just look at communications, just start there, because -- so, different things we heard from the Coast Guard, better ability to track chart recommendations.
MEMBER HALL: Just real quick on that one, it's not just Coast Guard recommendations, it's the ones that get referred to them as well. So people in the community, it sounded like, from the Coast Guard --
VICE CHAIR MILLER: Yes.
MEMBER HALL: -- were not also getting the feedback, so they went to the Coast Guard. It just got all around.
VICE CHAIR MILLER: But it was the Coast Guard that was feeding the recommendations to NOAA. And we had had some discussion yesterday afternoon, and then got a recommendation this morning, which is the next one, which was maintain an in-basin presence of navigations team staff in the Great Lakes.
Now that's not such a -- that's more, I guess, a recommendation to Coast Survey, and the Navigation Managers. Whether it's a high-level recommendation that we want to include, I'm not sure.
Make sure programs are coordinated

across different branches of NOAA is higher level. The -- putting water level, wind speed and direction on VHF or AIS, is that across NOAA?

Yes. It's Coast Guard, yes. And this issue we keep on bumping up against, a data interchange between Army Corps and NOAA, I think we're going to have an issue paper on that the next time, it sounded like.

And then --

(Off microphone remarks.)

VICE CHAIR MILLER: Yes. Yes. So out of this, any suggestions what a high-level communications recommendation might be? We try not to make them too piecemeal, I guess I would say. Any thoughts on that?

MEMBER HALL: I do think that the Navigation Manager, in-basin, whether it is a general recommendation that we have, that each of the regions have their person in-house, I think that's really important, because we heard that over and over and over again, that that was a disconnect, and how do they coordinate certain things.

I know Glenn offered, hey, anybody who wants to come to D.C., or if you're in D.C., we'll work with you. But it sounds like there is a missing link there. And I don't know if that could be a broader version, or if there's issues elsewhere.

Obviously, we only heard about the Great Lakes problem. But with that, a very general overview, or general recommendation to have your Nav Manager actually in the region for which they're the Nav Manager for.

VICE CHAIR MILLER: Yes. And Rachel can confirm this or not. I believe every other region has a full-time Nav Manager at this point. Is that not true, in-country, as you would --

MS. MEDLEY: Thank you. Hi. Thanks, Joyce. Actually, we just had a Nav Manager retire, Michael Henderson, so the Florida/Puerto/U.S. Virgin Islands billet is yet to be filled. So that's a vacancy. So we have people covering that, but they're covering their own AORs as well as that one.

Tom has done a great job, but he's, you know, got another job. So he's doing double

duty. And then we used to have a Hawaii billet, and we closed that. So Crescent, the Pacific Northwest Nav Manager is covering that one.

So I would say, in general, yes, we do have coverage, it's just people might not be in situ, which is, I think, what Kim is speaking to, is that that's where you really get your max value, in having someone in-house. Okay.

VICE CHAIR MILLER: Yes. Lawson?

MEMBER BRIGHAM: But in view of all the numbers we hear, and the economic reality of the relationship of this basin to the rest of the country, I mean, this one might be number -- well, top one. I don't know.

CHAIR HANSON: Of the unfilled?

MEMBER BRIGHAM: Well, of the unfilled, but however you look at it, I guess.

VICE CHAIR MILLER: And then, so the last two are -- and I think we probably should say something about, you know, we mentioned it before, but data coordination between Army Corps and NOAA continues to be a -- we continue to hear it at almost every meeting.

Okay. Let's go down to the next one. I mean, this was just across the board. There were -- and there were a couple places where we heard that -- well, the Bottom Mapping Working Group, and it appears that IOCM has part of that working group.

I guess, I would think that the Nav Manager would be -- if -- should be within that.

Are you in that group?

PARTICIPANT: Which group is this?

VICE CHAIR MILLER: The Bottom Mapping Working Group. You are? Okay. All right, so that's a null point.

But -- and perhaps -- this probably isn't a recommendation, but it should be part of the letter. We heard how important the partnerships are throughout the Great Lake -- yes.

MEMBER HALL: Just as you related it back to PORTS, we have to think about our issue paper. And what we're seeing is, that's the current workaround. It's not the most effective, efficient, fair -- you know, it's great that Lake Erie Association stepped up and took part in that, but that's not what we think is a

recommendation from this panel, going forward, how it should be addressed.

So I just wanted to see how we were, your thoughts on how that was going to be. Is it a statement that that's what we've heard or, and that's kind of your stopgap measure until such time as federal funding is provided?

Because I think we need to be really clear on that. If we have a paper that says, federal funding now, all the time, versus highlighting, this has been a great place where that's helped, but that shouldn't be the answer.

VICE CHAIR MILLER: And that's one current meter. I mean, it's not a PORTS -- I mean, they're calling it a PORTS system, but I mean, it's not all the air gap sensors and everything.

MEMBER HALL: Right. And I just wanted to understand what you were -- because your comment there, it almost puts it into a positive, and when I had --

VICE CHAIR MILLER: It's just a comment. I --

MEMBER HALL: Okay.

VICE CHAIR MILLER: It was just a note I had made, because of the presentation. And it's just an example of the partnerships here in the Great Lakes, as far as I can tell.

So is there any recommendation we want to make here? Or is this just a, you know, a paragraph in the -- I think this is more, you know, saying how good the partnerships are, and --

MEMBER KELLY: It just, I think that's just a good comment, that we heard there were very active and well-coordinated partnerships here in this Great Lakes area. I don't know if we need to really say anything more than that.

VICE CHAIR MILLER: Okay.

MEMBER SHINGLEDECKER: You might also highlight the unique international nature of some of those partnerships as well.

VICE CHAIR MILLER: Okay. Good. Okay. Let me stick that in real quick. Where is my document?

RADM SMITH: Yes. And I think the states are unusually heavily involved. I don't remember hearing from states quite as much, in

the PORTS, otherwise.

CHAIR HANSON: We didn't tap into them in these other places. We can -- Northwest actually has a -- West Coast actually has a very active governor's situation. They've been tackling water issues for years. So we should tap into them, as well.

VICE CHAIR MILLER: Okay. Yes, international and state partnerships. Okay. Now, this is probably a recommendation, especially since we're sending in a PORTS paper. I just, I had noted that Cape Cod, any system must be a PORT system.

MEMBER HALL: Lynne, can you scroll down for us? Lynne. Thank you.

VICE CHAIR MILLER: Yes. Back up. Yes. So I think we want to make a general statement about, we hear this everywhere we go, and we once again recommend and, you know, make the recommendation that's in your paper, the, you know, the high level, bottom line, up front recommendation that's in your paper.

Does that make sense? And we can add a, we can put a little bit in there about what we heard here, and make that. So that would be a recommendation, or maybe two, on communications, one on PORTS and water level sensors, and then come on down to mapping needs.

MEMBER KELLY: Joyce, just to interject, I think it's rather hard-hitting that we mention that the very crucial current meters in those areas are not functional because of lack of local funding.

VICE CHAIR MILLER: What, which current meter was that?

MEMBER KELLY: Can we roll back to that?

VICE CHAIR MILLER: I thought those were functional, but they just were saying --

MEMBER KELLY: I heard that they were there. They were necessary, but they were not functional at this time because of a lack of funding.

MR. EDWING: Right. So let me clarify.

(Simultaneous speaking.)

MR. EDWING: So I've been coming up here for a number of years, and just kind of

saying, okay the day's coming when these are going to start breaking down, and I don't have the funds to fix it.

Well that started happening with Cuyahoga.

VICE CHAIR MILLER: Okay.

MR. EDWING: And that's really what kind of motivated the carriers to step up and get it back on a sustainable path. The Maumee River's been going fine, but why? We may have to wait for it to start having real issues before someone steps forward and funds it.

Or if we get the House mark next year, it's going to get shut down. You know.

VICE CHAIR MILLER: And what about the St. Clair?

MR. EDWING: The same thing. Yes. Now, when those three meters were installed, two of them were installed for the navigation community. We are well aware of those needs. I actually have a list of 12 other locations from the Lake Carrier Association, where they would like for our meters.

The St. Clair was really established more for the IJC and to kind of help with the water management, the flow measurements they need for their models and so forth. So we're actually trying to -- we're looking to the IJC possibly to provide funding for that, so.

VICE CHAIR MILLER: And what would people would say? I believe it was Helen and her -- when she gave her comment that she said earlier groups decided that PORTS was not the best model for the Great Lakes?

MR. EDWING: Well, I think what she was saying is they didn't want to pay for the services. You know, they said they went for earmark and got all the -- the tide gauges up here were the first ones to go real-time, through the modernization.

VICE CHAIR MILLER: Oh, okay.

MR. EDWING: I forget, it was funded through the earmark.

MEMBER HALL: Yes. It's the funding approach, not the actual system itself --

MR. EDWING: Right.

MEMBER HALL: -- that was the problem.

MR. EDWING: Right. Right.

RADM SMITH: What I heard was that the partnership works well when you have a facility or a port or something to partner with. When you have a through --

MEMBER HALL: The in-transit problem is nobody owns it.

RADM SMITH: The in-transit, that who --

MEMBER HALL: Yes.

RADM SMITH: Right. Who's your partner? And I will just note a -- I guess, can, maybe can I interject here for just a second?

VICE CHAIR MILLER: Sure. Of course.

RADM SMITH: One is that there's a, there's been a theme, and a great deal of sensitivity in the downtown NOAA folks, about federal advisory committees giving personnel recommendations. And it plays very, very poorly.

And so -- and this has happened in a number of panels. And so there's a great deal of sensitivity to that. So in our discussion, or your discussion -- this is your letter, you write it however you want.

In your discussion about the Nav Manager, I would put it, you know, in terms of supporting the Nav Manager program, the absence of one, in-basin, was noted, and you know, but that, you know, that we --

VICE CHAIR MILLER: And a full-time Nav Manager was requested by the stakeholders.

RADM SMITH: Was requested by the stakeholders. And the HSRP thinks it's one of the -- with -- this is a valuable program that Coast Survey runs, something along those lines.

VICE CHAIR MILLER: Sure.

RADM SMITH: Rather than --

VICE CHAIR MILLER: We can do that.

RADM SMITH: Rather than being too pointed about --

VICE CHAIR MILLER: Yes.

RADM SMITH: -- the specific absence, or --

VICE CHAIR MILLER: Yes.

RADM SMITH: -- making a specific recommendation.

VICE CHAIR MILLER: Yes. We can, Dave writes very good nice words.

RADM SMITH: I guess the other comment

I would make is that the full federal funding for PORTS, they've heard it a lot of times.

VICE CHAIR MILLER: We know.

RADM SMITH: There's going to be probably negative value to mentioning it again, because it's going to look like we're stuck on it, rather than, rather than -- it's not that we --

CHAIR HANSON: The way the letter's written, we don't necessarily even make it one of our three major themes. We -- because we're also going to talk about the issue paper.

VICE CHAIR MILLER: Right.

CHAIR HANSON: And the issue will paper will repeat it, as a -- but not as one of the three main recommendations.

RADM SMITH: Yes.

VICE CHAIR MILLER: Yes.

CHAIR HANSON: It'll be a recommendation. It will be embedded.

RADM SMITH: Right. And the one other observation I have is that when, you know, you talk to the Army Corps, for instance, about a public/private partnership, you are talking about something that is very much like the PORTS system, which is cost-sharing among the federal government and the some local interested parties.

So we can't, out of the one side of our mouth say, we think that private/public partnerships are great, except we can't expect private to pay anything. Right. That's not the way it works. We've got to -- so I think we just need to finesse that, finesse that, the way that that gets phrased.

VICE CHAIR MILLER: Well it's not just private/public partnerships, it's partnerships with other governmental agencies, both state and federal, too. You know.

RADM SMITH: Sure. But that's sort of, the three-P buzzword means private investment, or toll roads that are run by a private company, or something along those lines, right, that are -- and it's not, PORTS could be a poster child for that approach.

VICE CHAIR MILLER: Well, I guess before --

RADM SMITH: So if we don't like it, we just --

VICE CHAIR MILLER: Yes.
RADM SMITH: -- shouldn't probably bring up that we like public/private partnerships and then except the one that we have to --
MEMBER HALL: Which was my point.
VICE CHAIR MILLER: Is there a difference between saying, NOAA should fully fund PORTS, and the federal government should fully fund PORTS?
RADM SMITH: Are you asking me? I don't see a difference.
VICE CHAIR MILLER: Yes, Rich?
MR. EDWING: Is there a difference between NOAA funding and the federal government funding?
CHAIR HANSON: In the letter.
MR. EDWING: Oh, putting that in the letter.
CHAIR HANSON: Yes. If we say, NOAA should fully fund it, or should we say federal government should fully fund it?
MR. EDWING: I think you have to say NOAA. I mean, it's the mandate, the statutory mandate. It's our responsibility, so.
VICE CHAIR MILLER: In HSIA.
MR. EDWING: Yes, in HSIA. I mean, Glenn, do you disagree, or?
MR. BOLEDOVICH: Well, I thought we just agreed that the -- because you had the issue paper, you're not going to mention the issue of funding of PORTS in the letter. You're going to leave that for the issue paper.
VICE CHAIR MILLER: Not as one of our three main recommendations.
MR. BOLEDOVICH: I think what you say in the letter, or in the issue paper is, once again, we visited the region, and one of their highest recommendations we heard about again and again and again, is PORTS. And therefore we feel compelled to make this recommendation to fund this thing.
(Simultaneous speaking.)
MR. BOLEDOVICH: Because that's what you're hearing. That's really the fact, everywhere you go.
MR. EDWING: Yes.
MR. BOLEDOVICH: It's again, and again, and again, the number one thing you hear

about is PORTS and its value to the nation, to that facility. And then that's kind of driving you to your recommendation in the paper.

Because the admiral is quite correct. The issue of full funding for PORTS has arisen and fallen several times, right. And so -- and I'm not saying the panel shouldn't write a paper about full federal funding, at all, against it, or should stop -- not true. I'm one for it.

But it is an argument that's been heard again. These papers are going to a new administration, and the panel is certainly, I think their paper is pretty persuasive, so. Your paper is, so.

CHAIR HANSON: I think in -- we're going to mention Cuyahoga. Right. That's an attaboy for everybody involved. A local actually is making an investment. So we'll mention that briefly in the letter, and not overplay our hand. That'll be the key part.

VICE CHAIR MILLER: Go to your mic.

CHAIR HANSON: I know. I thought it got booted off for a second. Well I'm done now.

VICE CHAIR MILLER: Okay. And so the last -- so we'd have probably a communications recommendation, but not specifically on the Nav Manager, just that we -- you know, this was an issue brought up by a stakeholder, and then we'd have -- what was the second one? My brain is dead.

Partnerships, talking about partnerships. And then we also heard clearly that there are a lot of needs for surveys here, lake level needs, navigation. It's not just bathymetry, as Larry said, it's also bathymetry and bottom characterization and so forth.

And I guess the recommendation that I would think, would be that in prioritizing surveys, that it's clear that NOAA/Coast Survey needs to include these, which we already have said. And we need to include these priorities for the region, for the Great Lakes, and for a different -- for a variety of needs in their prioritization process.

RADM SMITH: I would love to see a recommendation along those lines, that we don't have to think of our survey needs narrowly, in terms of large ships going into major ports. I

think that would be very important.

VICE CHAIR MILLER: Yes. Especially since you can -- well we also heard a request for possibly having more of a presence of a survey team up here. I don't know if that's, you know -- and then we heard about the Quintillion cable data becoming -- I mean that was sort of off the direct Great Lakes thing, but the data being made publicly available and so forth. I don't know.

MEMBER SAADE: Being provided to NOAA.

VICE CHAIR MILLER: Being provided to NOAA. Let's see. So what was that last one? Okay. And then let's go down to other. Lynne, can you go down?

We heard that they needed an icebreaker, updates of environmental sensitivity index maps, that these might be things we can just pass along to other groups. What about the clutter on the charts? How big of an issue is that?

RADM SMITH: Well, I guess I would say, I mean, there's about a thousand submerged piles at the west end of -- charted submerged piles, on the west end of Lake Erie. How many of them do you think are there? Some, right. But the users are completely ignoring all of them.

So either we care about showing obstructions and hazards to navigation or we don't. But we can't chart all this crap, and then have everybody ignore it, right? That's why the Athos wasn't charted. But, you know, these are potentially important, so.

I mean, we can just scrub them off of there and pretend they weren't there, but I don't -- that's not our normal process, and I don't think that that would be responsible. So in order to get things like that off the chart, you have to do an object detection survey to show that that piling's not there.

VICE CHAIR MILLER: So what would solutions be? Do the survey?

MR. ARMSTRONG: Well, potentially some of the solutions would -- or one of the solutions might include, you know, a better display system, a different approach to display. So there's potentially things that can be done to improve the display.

I think the admiral's absolutely

right. We can't just remove dangers from the chart because they're inconvenient.

RADM SMITH: Photographically inconvenient, no. But there was another context of the clutter, and I think this probably goes to Captain McIntyre's point a little bit, is that there's been a big effort to put it on the chart, right, including now a new -- and I'll pick on my friend Scott here a little bit, if he's still here.

You know, when AIS virtual aids starting coming out, or synthetic aids, well there already is a Navaid there, right? So how do you show, on the chart, that there may or may not be an AIS target there? Well you put another little magenta thing around it, right.

And then when you actually get the AIS, you have another thing. So now we have three representations of the same buoy. And some of it covers over the label and, you know, and then if you, and if the AIS thing actually has another label, you have a second label.

So now we have two labels and three representations of one Navaid, none of which is providing any more information than if we just put it on the chart itself. And that, I think, I -- you know, we heard that in the context of the virtual aids.

MEMBER HALL: And I don't think it's an AIS chart. It's AIS information on the ENC, or on the -- showing up, right? It's -- I've never heard of an AIS chart as written up here on the screen. It's AIS data on the chart, right?

VICE CHAIR MILLER: Oh. Clutter on -- yes.

MEMBER HALL: Sorry, I just --

RADM SMITH: I could show you an example, but --

MEMBER HALL: No, no. I'm just saying --

RADM SMITH: The way it's --

MEMBER HALL: -- from her wording up there, it says --

VICE CHAIR MILLER: Yes.

MEMBER HALL: -- clutter on AIS charts. I just was questioning what an AIS chart --

VICE CHAIR MILLER: How about AIS

clutter on charts?

MEMBER HALL: Yes. That's -- yes. Thanks.

MEMBER MCINTYRE: Yes. Because there are two issues. I mean, what you're talking about with the obstruction isn't an AIS generated problem. It's just a charting problem.

RADM SMITH: Yes.

MEMBER MCINTYRE: And then you also have the problem with AIS clutter when you have a lot of targets. But with the electronic charts, and the AIS information, it's layered.

And you can -- you know, when you know, and you're trained how use the equipment, you can turn those layers off, and you can scale in, and there's like all kinds of things that you can do to responsibly navigate, you know, when those kinds of conditions exist. But it can be overwhelming when you turn it on and you see a lot of stuff.

VICE CHAIR MILLER: So something like look for solutions to problems with AIS clutter on charts, or --

MEMBER MCINTYRE: No. I wouldn't even -- maybe I would just say, clutter on electronic charts.

VICE CHAIR MILLER: Okay.

MEMBER MCINTYRE: Maybe, it's --

MEMBER KELLY: And this kind of ties into an issue which the admiral had brought up in a kind of unique turn, where there's an underlap between what the Corps does and what NOAA capability is, to detect smaller objects that may pose a hazard to navigation, and how to ensure that that is done, and how it appears on the chart.

Because I think that's the more critical issue. How do we actually find that there is stuff that could be a problem, to how we display it is the secondary step. And right now there seems to be a gap between the Corps and between the -- between NOAA and the Army Corps.

VICE CHAIR MILLER: So that should probably go up with the discussion on Army Corps -- in the discussion about communications, where we talk --

RADM SMITH: I think of it as sort of a separate issue.

MEMBER KELLY: Yes. I think it's separate. I don't think it's communications as much. It's more a structural type approach.

VICE CHAIR MILLER: Is it worth talking about in the letter?

MEMBER KELLY: I think it's kind of an important issue. Exactly how we phrase it or where we put it, but I think we need to somehow pass that -- sorry, pass that along.

MEMBER MCINTYRE: You know, with the electronic charts, they're held to so many international standards in what must be displayed, what can be added and everything like that. It doesn't seem to me that it's going to be possible to really change the formatting of how it's done.

It seems that it's more of an issue of what you said, as far as procedurally, what's the approach going to be on things that haven't been verified for a long time. It's more, not so much an issue with the chart, but with the process of how the information is put on the chart.

RADM SMITH: If you'll permit me to dive into the weeds here for just a second, there's a notion in the ENC, it's called CATZOC, right, which describes the quality of the underlying data.

Army Corps surveys, in general, fall in that lower category of surveys, because they do -- not that each individual sounding is not accurate, it's that the density of it is not adequate to show that there's nothing, no hazards between the lines.

And so right now, we're not charting it in that low -- we're not essentially advertising and outing our partner, that their surveys are inadequate for that purpose, but following the rules, we should be.

And I think we're going to be at the point here real soon where we need to do that. So now, it's -- now this issue is out. So I guess we're sort of giving you a preview here of perhaps the, you know, the problem to come, once we start to unpack this.

And it probably is premature for the panel to weigh in on it now, but I circulated the Athos legal document, which I don't expect you all to read. I didn't read the whole thing. But

you can skim the table of contents, and go to the juicy bits.

And there's, you know, the upshot is there's an expectation that we find these little things. And yet we are documenting, you know, we're essentially about to document that we're not doing that.

MEMBER HALL: So is this a point where we can just mention that it's something that's brought up, it's something that the, that we're now, as a panel, understanding and looking to learn more in our next few sessions, rather than make any recommendations at this point, but recognize it as a problem?

And then hopefully it's something that, over time, we can resolve it. We don't always have to resolve it now, right.

CHAIR HANSON: I guess the only thoughts, and we'll obviously talk some more about these details as we engage more in the Corps/NOAA discussion. We do multibeam surveys, of course, after every project, and so I think there's a lot to work with there.

The problem is, that's only good for a short time. So but there may be some things to talk to the Corps about as well, with their eHydro and their plans and goals for that as well.

RADM SMITH: Well, I think that there's the survey, and then there's the interpretation of the survey, right. As the multibeam survey was done simply to do a delta against another multibeam survey, to get the volume. That still doesn't net you the recognition of the small features, right.

CHAIR HANSON: Well, particularly in even a port like Miami, it's obstructions. I mean, they want to make sure they got it clear, cleared out. So it's as much for paying us, it's as much to make sure they turn it over to the port that it's, they got the depth they -- particularly in rock.

Again, the softer material, that's a little different discussion.

VICE CHAIR MILLER: And then the last item I had, we heard about the lack of funds for the smaller harbors. But that's dredging, and I don't -- you know, it's --

RADM SMITH: It's just dredging.
VICE CHAIR MILLER: It's just dredging, yes.
(Laughter.)
MEMBER HALL: And just to clarify, that's the same reaction to icebreakers, right, when it's not really us?
VICE CHAIR MILLER: Yes.
MEMBER HALL: Okay. I just want to make sure I'm tracking.
VICE CHAIR MILLER: I was just, you know, tracking asks, basically, you know. But, you know, these don't all need to be in there. And what I want from you guys now is, have I missed anything? Or do you think there's, you know, it'll take a bit to -- also, we have all morning tomorrow to dwell on NOAA issues.
And he's gone. Do we have other things that we want to discuss tomorrow morning?
MR. EDWING: I just want to go back to the last bullet there, recreational harbors. And actually, not exactly this, but I talked about the lack of funding for seasonal gauging for the IGLD update, which it's really the smaller recreational harbors that are going to suffer, you know, if that gauging doesn't get done.
So you may want to say something about that in there. We're trying to do partnerships to attack a lot of that, and so it kind of really ties into that partnership effort, but that's not going to get us all the way there.
VICE CHAIR MILLER: What was the item name? What was the --
MR. EDWING: It was underneath the International Great Lakes Datums Update.
VICE CHAIR MILLER: Okay.
MR. EDWING: And I talked about, you know, we're only funded to do a bare bones update, which is using the existing NWLON network. But by the protocols, there should be seasonal gauging done at all of the other smaller ports and harbors that aren't, you know, under the federal, federally maintained provisions.
And we're -- because they don't have the funding for that, we're attacking that through a series of partnerships. You heard about the Coastal Storms Program funding, GLRI funding.

We are going to be, you know, kind of leveraging some of our VDatum funding to get some of that done. But it's not going to get us -- that's maybe going to get us a third to a half of the way there.

VICE CHAIR MILLER: So it is -- I mean, we can say, for things such as datum updates and dredging, it means the that smaller recreational boat harbors -- and how many are there? There were a lot.

MR. EDWING: Yes. There's like 140 or something like that, yes, which we know we're not going to -- and we know we don't -- you know, not all of them probably would need it, but.

VICE CHAIR MILLER: So --

MR. EDWING: I'm just throwing it out there as a suggestion, since -- just to get a little recreational harbor support in here, for Susan, you know.

MEMBER HALL: Admiral, just a quick question for you, on your -- this came over here. Kim? Yes. Want -- yes. Hi. The end, little -- yes. These seats. I got to talk to you guys about that.

What about the concept that you had brought up, you know, kind of the level of care can't quite be equitable across all forms of sea, looking for -- this is maybe where the, for communications, your public/private partnership, maybe we don't relate it to PORTS at all.

But it seems like your crowd sourced bathymetry, you know, in the IHO project they're doing there, and a couple of things, we start recognizing where there is really value-added from those public/private partnerships, or where we can recommend that there be kind of, thinking more about that, how do you get industry involved, how to, how can HSRP help make that recommendation?

Because I know you guys are already trying to do it. But we're constantly pushing on you all, but we don't always kind of -- and I know we're not advocacy group, and we're not lobbyists, but how do we get that message out and help you all get a message out?

RADM SMITH: One of the values of the letter is because frankly, it goes to the Administrator, but it pretty soon ends up back on

our desks, right --

VICE CHAIR MILLER: Yes.

RADM SMITH: -- for to be answered, and then it gets, and then the answer gets re-sanitized on the way back out. So the letter that we saw was as much of a surprise to you as it was to us.

But it -- but that chop chain, as it goes up and down, provides an opportunity for a conversation within NOAA. So if there are things that you -- one thing that could be useful without causing anybody a lot of work, would be to take note of it in the letter, and say that you look forward to hearing more about it, and over the course of the coming meetings, or something like that.

And that doesn't cause anybody any work. But it still calls attention to the fact that we might be doing something that pleases you, and that that makes us look good with our bosses.

VICE CHAIR MILLER: Okay.

MR. BOLEDOVICH: Yes. I just had kind of a thought. In terms of the information that you get from these regional folks at these regional meetings, the notion that you're going to turn one of, something you heard into a recommendation from that meeting of the panel's, is almost premature.

I mean, you can't vet what they're really saying. You've got three issue papers coming out of this meeting. You're making great recommendations. You have strong ones. But I think that maybe your papers say, this is what we heard. We recommend that Coast Survey or CO-OPS look at this and maybe report back to us.

That what you're getting as input from these folks shouldn't be turned into a recommendation from the panel at that meeting, except in some rare circumstance. That that should be, wow, this is cool, we've learned a lot of new stuff. Maybe we should vet it. Could you do that, Coast Survey? That should be your letter, right?

And then you're going to be hearing stuff, well oh wow, this might be something we need to take on for future consideration. That might turn into a recommendation later.

Even if the chance that some of the stuff you're hearing might, you know, just be a complaint, that might not even be well-vetted, you know, and you want to save yourself that, you know, risk.

But something along those lines. I'm just, it's just a thought that maybe we should -- your recommendations coming from me shouldn't be the regional folks' recommendations. As I said, you should put those forward. This is what we heard. This is what they want. And that's their summary, and that -- and --

VICE CHAIR MILLER: Well, I mean --

MR. BOLEDOVICH: -- it gives us food for thought, all of us, the panel --

VICE CHAIR MILLER: Yes.

MR. BOLEDOVICH: -- and the agency, for future consideration.

VICE CHAIR MILLER: Well, especially if it's a recommendation we've already made, or we've heard over and over and over again, and so forth. You know, that -- then it's not just a Great Lakes Region problem. Then it's a broader scale problem.

Lawson?

MEMBER BRIGHAM: I didn't see the observing network in its robustness on your list.

VICE CHAIR MILLER: Well, I --

MEMBER BRIGHAM: Both Larry Atkison and I are on a campaign to make sure, at every one of these meetings, we bring up the broad and complex topic of climate change. And what I heard here was not a lot about climate change.

And yet, I heard that the network, the observer network's not robust enough to give us, in the end, navigational information, water levels or whatever, but also to tease out natural variability and anthropogenic change.

And so I heard that, and that relates to the winter time, and year round observing network, whatever it is, I mean, satellites and lake ice and water levels and gauges and the whole mix.

And so I really think that if that message is accurate from our panel, and I think it is, we should put it in there.

VICE CHAIR MILLER: You want to write up a bullet for it, for tomorrow?

MEMBER BRIGHAM: Sure.
VICE CHAIR MILLER: Oh, you're gone.
MEMBER BRIGHAM: No. I can write something up. I don't know if I'll do it by tomorrow, but it could come in an email to you.
Yes. No, I -- let me just make my point again. Prior to this meeting, I wanted to have some briefings on Arctic climate change that relate to this. I mean, not Arctic climate change, climate change in the Great Lakes.
And it looks like that maybe we don't have a good handle on those issues. But because the whole place is a navigational basin, I think you can intuitively say that climate change will have long-term impacts, decades out, or through the century, that might maybe enhance the navigation, or limit the navigation.
And I don't think the environmental intelligence and the stuff that Administrator talks about, that here, regionally, the observation network is adequate to the task.
VICE CHAIR MILLER: Well, under PORTS and water level systems, I kind of think that is the, as the observational system, the sensors involved with it and so forth. And we clearly heard that it's not adequate, so we could say that the observation systems that lead to, that provide information needed to monitor the --
MEMBER BRIGHAM: Well, yes. And also, of course, the observations are related to the modeling efforts. And you need good input data to make the models work. I mean, we had a couple good examples, but more data and more input to the modeling efforts would enhance the performance of their prediction capability.
MR. EDWING: So this is Rich Edwing. So we have a wish list from the Lake Carriers and others up here, of additional water level stations they want, and current meters, that we've really said, if you want those, those need to get new PORTS system, because, you know, I'm meeting my NWLON requirements up here, for the most part.
However, we also heard from Debbie Lee that I think, from a climate change perspective, some of the really big gaps are evaporation and precipitation, and those are kind of the missing pieces that will lead to a better understanding

of the hydrologic cycles in the area, so.
VICE CHAIR MILLER: So Great Lakes conditions such as evaporation?
MR. EDWING: Evaporation and precipitation, which are things that NOAA's working on, just not the, you know, the hydrographic services.
VICE CHAIR MILLER: So they're inadequate to do what?
MR. EDWING: I guess, get a full understanding of the hydrologic cycle up here, and then for climate predictions.
MR. BOLEDOVICH: Yes, to -- an accurate, for accurate and reliable future climate predictions.
MR. EDWING: Right. Right. Right.
MR. BOLEDOVICH: But that's true everywhere. But in the northwest, you know, whether it's forest fires or whatever, they need more data, need more observations. Everybody does. Just they're unique needs here, but --
MEMBER BRIGHAM: I think it's minimal in the winter here. And we do have a seasonally ice-covered oceans here. And I don't think the data is robust to capture a good part of the year.
VICE CHAIR MILLER: So how's this? Seasonal observation systems that provide information needed to monitor and model the Great Lakes conditions, such as evaporation and precipitation, are inadequate for reliable climate and climate change predictions.
MR. EDWING: I don't think it's seasonal observances.
VICE CHAIR MILLER: Oh, okay.
MR. ARMSTRONG: Maybe insufficient's a better word there.
VICE CHAIR MILLER: Insufficient? Okay. So I get the sense that, yes, this is a laundry list. And we're trying to relate it to other things we've heard, you know, previously.
And, I mean, we could almost use our papers as the recommendations from this, you know, the three papers as the recommendations, if we wanted to.
Are you think -- do the -- does the panel think that there's anything that stands out strongly enough here that we should make a, you

know, a strong recommendation on it?
So it's observation systems, we just talked about. And that could be -- that's sort of inclusive of PORTS. Communications, partnerships, and mapping needs. I would say mapping needs are probably strong enough for a recommendation, but then I'm a mapper, so.
Any strong feelings about it, one way or the other?
CHAIR HANSON: You wore them out.
MR. ARMSTRONG: Well, I think there's always Glenn's approach to saying that we've heard this, and we asked Coast Survey to evaluate the issue of, you know, issue of near shore bathymetry, or you know, near shore bathymetry in the Great Lakes, or near shore observation program and bathymetry.
VICE CHAIR MILLER: And maybe we couch it in terms of, these are broad issues we heard and, you know, we need to study this more. I mean, if it's not a strong recommendation, and --
MR. ARMSTRONG: Well I thought it was compelling, but it was one person saying one thing, right? That --
CHAIR HANSON: And so without a little more discussion it, that for all of us just to embrace it as a recommendation is a little --
VICE CHAIR MILLER: Yes. Okay.
CHAIR HANSON: -- premature.
VICE CHAIR MILLER: What did we hear repeatedly, from multiple people?
CHAIR HANSON: Mapping.
MR. ARMSTRONG: Well I think we've heard that the services are important. We heard that over and over again.
VICE CHAIR MILLER: Yes. And partnerships are important.
MR. ARMSTRONG: Right.
VICE CHAIR MILLER: So is the sense this should be a, this is what we heard letter, rather than a strong recommendation letter?
MR. ARMSTRONG: Well I think a recommendation to, for Coast Survey to --
VICE CHAIR MILLER: Yes, but this is a recommendation letter to the Administrator.
MR. ARMSTRONG: Right. The Administrator can turn around and call Shep, and say, get on this.

VICE CHAIR MILLER: New admiral.
CHAIR HANSON: I think this, in combination with the issue papers, is quite a lot to chew on. You know.
MEMBER KELLY: And our recommendations aren't necessarily limited to what we heard because of geography, we happened to meet here, so.
VICE CHAIR MILLER: Okay. Well when I'm awake at 3 o'clock this morning, I'll --
(Laughter.)
VICE CHAIR MILLER: I'll say -- I'll come here. What's your room number, Glenn? I'll call you and say, hey, what do you think?
(Simultaneous speaking.)
MR. MAGNUSON: -- natural Midwest person.
MEMBER MAUNE: Your husband will call you to tell you, your husband will call you in the middle of the night to tell you they're having a hurricane out there.
VICE CHAIR MILLER: Yes. That's right. I think the -- as usual, the Big Island's going to veer it off, and it's gone, so.
CHAIR HANSON: You got an infrastructure?
VICE CHAIR MILLER: Yes. Okay. So it's 33 minutes late, but.
CHAIR HANSON: All right. Before adjourning for the day, once again, time has been set aside to provide an opportunity to present public comment to the HSRP. Is there anyone signed in and ready to present public comment?
MEMBER HALL: Why don't you ask your audience first. I mean, I don't -- I haven't seen anybody's name.
CHAIR HANSON: And I did see Jon Dasler last week, and I asked if he was going to call in.
(Laughter.)
VICE CHAIR MILLER: For those of you that don't know Jon, he's our groupie.
MEMBER HALL: He was there in Galveston, and I had a meeting with him and invited him to D.C. So yes, he made himself very well known.
CHAIR HANSON: Drum roll?
VICE CHAIR MILLER: Does our

Navigation Manager want to say -- do you have a comment?

CHAIR HANSON: All right, stretching.

VICE CHAIR MILLER: Stretching. Okay.

CHAIR HANSON: Highly recommend it.

All right. Stand by. All right.

Hearing no comments, having no one on the line, we will adjourn for the evening.

(Whereupon, the above entitled matter went off the record at 5:35 p.m.)

H

C E R T I F I C A T E

This is to certify that the foregoing transcript

In the matter of: Hyrdrographic Services Review Panel

Before: NOAA

Date: 08-31-16

Place: Cleveland, OH

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

Neal R. Gross

Court Reporter