U.S. DEPARTMENT OF COMMERCE

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NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

(NOAA)

HYDROGRAPHIC SERVICES REVIEW PANEL

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PUBLIC MEETING

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THURSDAY

AUGUST 30, 2018

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The Hydrographic Services Review Panel met at the Elizabeth Peratrovich Conference Hall, 320 W. Willoughby Avenue, Juneau, Alaska, at 9:00 a.m., Joyce Miller, Chair, presiding.

HSRP MEMBERS PRESENT

JOYCE E. MILLER, HSRP Chair

EDWARD J. SAADE, HSRP Vice Chair

DR. LARRY ATKINSON

SEAN M. DUFFY, SR.

LINDSAY GEE

KIM HALL

EDWARD J. KELLY

CAROL LOCKHART

DR. DAVID MAUNE

CAPTAIN ANNE MCINTYRE

CAPTAIN (ret. USCG) ED PAGE

SUSAN SHINGLEDECKER

JULIE THOMAS

GARY THOMPSON

NON-VOTING HSRP MEMBERS

CAPT ANDY ARMSTRONG (ret. NOAA Corps), Co-

Director, NOAA/University of New Hampshire

Joint Hydrographic Center

JULIANA BLACKWELL, Director, National

Geodetic Survey, NOS

RICH EDWING, Director, Center for

Operational Oceanographic Products and

Services, NOS

DR. LARRY MAYER, Co-Director, NOAA/University of

New Hampshire Joint Hydrographic Center

STAFF PRESENT

REAR ADMIRAL TIM GALLAUDET, Ph.D. (ret. USN),

Assistant Secretary of Commerce for Oceans

and Atmosphere, and Acting Undersecretary of

Commerce for Oceans and Atmosphere, NOAA

REAR ADMIRAL SHEP SMITH, HSRP Designated Federal

Official; Director, Office of Coast Survey

GLENN BOLEDOVICH, Policy Director, Policy and

Constituent Affairs Division, National

Ocean Service

CAPTAIN RICK BRENNAN, Office of Coast Survey

ASHLEY CHAPPELL, Office of Coast Survey

VIRGINIA DENTLER, Center for Operational

Oceanographic Products and Services

COLBY HARMON, Office of Coast Survey

DR. NICOLE KINSMAN, National Geodetic Survey

CAPT ELIZABETH KRETOVIC, Office of Coast

Survey

LAURA REAR McLAUGHLIN, Center for Operational

Oceanographic Products and Services

LYNNE MERSFELDER-LEWIS, HSRP Coordinator

NEERAJ SARAF, Office of Coast Survey

ALSO PRESENT

MICHAEL EMERSON, Director, Marine Transportation

Systems Management, U.S. Coast Guard

PAUL FUHS, President, Board of Directors, Marine

Exchange of Alaska

WILLIE GOODWIN, JR., Chair, Arctic Waterways

Safety Committee, Kotzebue, Alaska

JAY STERNE, President, Windward Strategies, LLC

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

(9:01 a.m.)

CHAIR MILLER: Thank you everyone. Good morning and welcome to the Thursday morning session of the Hydrographic Services Review Panel.

I'd like to thank everyone for yesterday's excellent session in the morning and our remarks by Admiral Gallaudet and Nicole LeBoeuf. Hopefully I didn't mispronounce that name too terribly. LeBoeuf.

So the first thing this morning, as normal for us, is we'll go around the room and get comments. I think I'll mix it up a little bit. Susan Shingledecker, how would you like to start?

Everybody over there complained about being last so I'll make you first.

MEMBER SHINGLEDECKER: I haven't even got my laptop fired up yet with my notes.

(Laughter.)

MEMBER SHINGLEDECKER: I guess what struck me yesterday really was our tour of the Marine Exchange and just really the innovative nature that Ed and his team have taken in their approach to finding where the gaps are and filling that.

And I think as someone who works in the nonprofit sector, that's often what we do best. And just seeing an example of another really innovative organization that's looked at ways to have really sustainable sources of revenue, to continue the work that they do and to just be able to overcome challenges that people find with, sometimes with governmental entities things take longer to get done.

And I mean, his team was saying, oh, you guys need a weather station there, you need some weather data, we can get that up in a week. I mean, that was amazing.

So that was really the biggest takeaway for me and just appreciation to Ed and his team for all that they're doing and it's a great model.

VICE CHAIR SAADE: Lindsay.

MEMBER GEE: Yes, Lindsay Gee. I think I'll also repeat what Susan said, and I think that reflects yesterday, as I said, coming to Alaska it's like, you see it's the last frontier and there are fewer people and they have to get things done, they have big challenges and they just get on and do it.

And I think that's a big difference we see, and I think Ed's was a great example of that. I was really very impressed.

A takeaway from yesterday, the AMEC meeting, I guess it was good to, great to see that moving forward and finally getting to the blue bits I guess is what I would say.

It's good to see that and it would be, it's important that, obviously for that move to forward, all of that foundation data I guess that --- underlying isn't seen, but that just has to be done. So I think that's something, it was good to see that happening and going forward.

MEMBER HALL: Hi, it's Kim Hall and I knew Susan was going to steal my thunder.

I think the big thing with regard to yesterday is that HSRP could use an emotional support dog named Zoe. I'd like to see that happen at the next meeting.

But really, I think to echo what Susan said, it's amazing what they can do with so little. And it's also amazing how agile groups like the Marine Exchange, and I think Ed's group here in Alaska is probably the gold standard, even though they don't always need the gold standard, they are a gold standard themselves with regard to being flexible, agile and really being able to meet the needs of the community here. So I think that's something that we just have to keep in the back of our minds.

I know that we have not heard much here, most meetings we hear about PORTS, the PORTS system. And I think up here what we've learned is while it's a valuable system there are other ways to go about getting some of that data and that they have the capability to share more with folks going by.

And yes, I know we would love for more PORTS, especially if it was federally funded, but if you can't get that, obviously some of these more agile creative solutions have been very helpful to the mariners up here. So thanks.

MEMBER THOMPSON: Gary Thompson. I was very impressed yesterday with the Marine Exchange for their innovation in their ways of meeting the needs of the community. I think it was a great example of a partnership with government.

I too was impressed when they talked about when somebody needs something they would take action and get it done in a very short time. So, a good example of what can be done in other areas of the country.

MEMBER LOCKHART: I think this is going to get really repetitive by the time we get around to you, Joyce. But yes, same thing, I think the Marine Exchange and the work they're doing up here is just really impressive.

That same, like everybody said, being agile, just going out and getting things done that they know need to be done is a really good example and, yes, I was really impressed. I don't think there's anything to add to that that people haven't already said, so.

MEMBER ATKINSON: I didn't even try to comment about the Marine Exchange because I knew it would be taken by now.

(Laughter.)

MEMBER ATKINSON: One thing that kind of intrigued me was the, you know, where is the shoreline and the activities that are going on to define that between the different agencies. I know in our home area shorelines are changing but I hadn't thought about it that much and how you actually define where they are and the implications. So it might be nice to hear about that more in the future.

MEMBER MCINTYRE: I'm going reiterate the comments on the Exchange, I thought it was great exposure.

The one thing in our group, when we were visiting kind of the command central there, we had some discussion about re-broadcasting and pushing out of real-time data. And one of the things that came up, that it's something that I think we should as a Panel support, is NOAA data being broadcast over AIS and kind of trying to work better on that relationship in order to push that, the PORTS data, out over AIS.

MEMBER KELLY: Good morning, Ed Kelly. As usual, a lot of -- already stuff has been stolen.

We haven't mentioned yet, but I appreciate the directors' reports. That's a great opportunity for us to just get periodic updates of what the directors are seeing on their dashboard and through the window looking ahead through the windshield.

So, I always value that and I think it's important, I'm glad we do that every time and I hope we do continue to do that.

I'm glad that everyone has finally realized that everybody involved in Marine Exchanges are really cool.

(Laughter)

(Off microphone comment.)

MEMBER KELLY: Yes. Well, not all of us but the best of them are. Of course, the other point to realize, which some may have picked up and some didn't, Zoe is the brains of the operation. She hires Ed to be the public spokesman because she doesn't like to leave the house, that's all.

But I think the key thing is faster, cheaper, better. We were hearing that with the -- and we heard yesterday from the people in the IOOS groups and the RAs.

RAs, Marine Exchange, there is a lot of organizations, many of them nonprofit, all of them, they're associated with the topics that we are driving and want support from. And this amazing stuff that can get done in Ed's Marine Exchange is being done in a lot of other Marine Exchanges.

And there's cool stuff being done in a lot of the RAs. And I think we have to be a little more structured to aggressively reach out to harness and use some of that so far, perhaps -- I wouldn't say un-channeled energy, but maybe improperly or insufficiently channeled energy, to get that stuff out there and get all of this horsepower working together to help us forward some of our projected goals.

MEMBER DUFFY: Yes, Sean Duffy, Big River Coalition. And I've known Ed Page for about 15 years and it was really neat yesterday to put eyes on the work that he's been doing.

And you know, it's my first time to Alaska. I live in a land that's very different, but it was interesting to hear that we have a lot of similar challenges related to the coastline and changing dynamics around it and how to get the information out to the mariners, making people aware of what's there and trying to find ways to fill in what's not there.

And I think Ed and I both have kind of the commonsense approach to, kind of like rivers, we hit something hard we may bounce off but we're still going to keep flowing and trying to find the sea at the end. So thank you.

MEMBER MAUNE: Dave Maune from Dewberry. Juliana and Admiral Gallaudet and I did not go to the Exchange yesterday afternoon because we were attending the Alaska Mapping Executive Committee, AMEC meeting, which made me very happy because I was able to present on the Alaska IfSAR mapping success story.

And that success story is being used as a model on how can we apply the lessons learned along the way in doing the topographic mapping of Alaska, to extend to the bathymetric side of Alaska, which is our -- the next thing on the docket.

And I'm especially pleased because the AMEC, in the past, has had the USGS focus for topographic mapping, and now we have co-chairs. And the Admiral is Co-Chair of the AMEC now.

And so, he and the USGS director are co-chairs. And I am absolutely delighted to see that, and that will help us in that transition from the topographic focus to the bathymetric focus that's so dearly needed up here.

(Applause.)

MEMBER THOMAS: Okay. Julie Thomas, HSRP. Geez, there were lots of things yesterday. I really enjoyed listening to some of the new technologies that are out from ASV and charting as to the challenges of establishing a VDatum in Alaska.

I loved Dave's IfSAR presentation and hearing the Denali surveying story. That kind of -- you don't appreciate sometimes what goes into getting these, I don't know, scientific datums that we need.

And Shep, I'm not going to quote you exactly because I can't write fast enough, but you made this statement which really rang true with me yesterday. You said something about the value of services, of NOAA services, for engineering in the ocean environment and how they contribute to the economic development and how you need to package services in a way to make them relevant to stakeholders.

And this, I think, was in relationship to getting fuel ashore and what you might be thinking about in the future to help survey that shoreline area that's so difficult. I thought that was a really nice statement.

(Off microphone comment.)

(Laughter.)

MEMBER THOMAS: I was copying it down and I'm going, oh my God, I've got to capture that, and then I don't know if it was right. But anyway, I love that idea.

And I think that that's a real benefit, obviously, of hearing these stakeholders but also hearing on the new technology side because it keeps pushing us into that arena of what we're not doing, where the gaps are where we're not covering yet. And I thought that was a really key statement.

And of course, Ed, the Marine Exchange was fantastic. And the little I have worked with AIS in trying to deal with getting data in there, my heart goes out to you because you've done a great job.

RDML SMITH: Thank you.

MEMBER PAGE: I think my highlight and the biggest observation of the day was how impressed I was or surprised, how much beer HSRP can drink --

(Laughter.)

MEMBER PAGE: -- in a sunny day on my deck, so we have to replenish the keg I think, but kudos to you there. And then follow-up by gin, so I was very impressed actually.

I'm also impressed that, I appreciate all of the positive comments. I think it's great that in the very competitive Juneau Empire, that we've made the front page for two days in a row. There is no mention of Stormy Daniels or anything else, you beat her out. So that's pretty hard to do.

And it's eight pages, so you made the front page. But I think the key thing there is, it's a small paper only but it talks about very relevant things to Alaska, so it's great that Alaskans really do pay attention.

It's a maritime state. There is no state more maritime than Alaska, when you think in the enormity of it and how dependent we are on it and what have you.

So NOAA is certainly a big player and it's nice to see they're getting attention. So, I was glad to see that kind of recognition of NOAA and what we're trying to do here so that's terrific.

Also, probably my more productive point, I hope I don't put words in people's mouths, especially since they were spoken at Red Dog Saloon about 10 o'clock at night over a couple of beers, but with Mike Emerson and the Coast Guard we were discussing, how can we get PORTS incorporated and the AIS dissemination thing. So I think the Coast Guard is -- I know the Coast Guard is interested because they did this CRADA, and the report's not out yet but I saw the draft report and of course, this technology can work and whatever, we've been doing it for five years.

So I'm very hopeful that, and the opportunity to sit down with NOAA and the Coast Guard and ourselves, the marine industry, all have the same interests, can we somehow put this together. So I think that part of the thing is getting the right people together in a room and an opportunity to explore, discuss, see, and see some opportunities to move forward.

And certainly some technological challenges but I think we've overcome most of those things and we've demonstrated we can do it, and we are doing it to some extend right now.

And the pilot program wraps up in a month and the question is, do we go on or do we stop. And I think that we have some ideas about moving forward, so I think that was also very productive.

And likewise, or similarly, the Marine Exchanges in the country are meeting here in a couple weeks, in Baltimore, and one of our discussion items is, how can the Marine Exchanges play a role in helping push out this data through our AIS network. And we have a national AIS network.

So there may be some quick easier ways of going down this path, public-private partnerships, accelerating some of the implementations to capabilities. So, to that end, I'm very pleased with it.

We want some tangible, we want some products to come out of this that move the ball forward, and I think we're going to move the ball forward in several arenas as far as hydrographic surveys and dissemination of data and the new ways, approaches and technology, whatever.

So that's encouraging that it's not just a meeting, it's a meeting that delivers and provides some new opportunities.

So, I sure hope I didn't misrepresent our conversation late at night over a couple of beers but I think it's pretty close to the mark, so thank you.

MR. EMERSON: Close enough.

MEMBER PAGE: Close enough, good. Thanks, Mike. Glen.

MR. BOLEDOVICH: So, I don't have too much to add to what everyone has said, I would just -- so you know, we've been working with the Coast Guard, trying for many years, to get data put out of AIS. And so I always tell the Panel every time we meet, so the best advocate for our programs is not ourselves it's our constituents.

So if the Marine Exchanges can kind of push that, that may be what helps to push this over the top and we appreciate that support.

CAPT ARMSTRONG: Andy Armstrong. So, like everyone, I was completely and thoroughly impressed with the Marine Exchange and what they're doing.

And I also appreciated and was impressed with the IfSAR mapping presentation we got at lunchtime. And I'd just like to point out that I think it's notable that two members of our Panel are key people in both of those really important efforts and enterprises, so I think that says a lot about the Panel.

And I'm really pleased to be part of a Panel that has people on the leading edge of these kind of services.

DR. MAYER: Larry Mayer, Joint Hydrographic Center. And I of course thought that the highlight was the presentation of the Joint Hydrographic Center, but no, not really actually.

I also was really thrilled to see the bringing of the blue side to AMEC. I think for years we've been seeing this kind of dividing wall and I think it's wonderful to see that connection.

There are still going to be issues in terms of the actual transition, but the first step is recognition of the problem. And I think that's --- we're well over that, and I think that one will be resolved.

The IfSAR mapping presentation, also I thought was just fantastic. And hopefully it kind of presents a model for maybe the way we can address the offshore too.

I love that model about how all the different constituents, in this case both federal and non-federal kind of contributed to the cost, or should have contributed. At least they were on the list.

There was some zeros I noticed, but should have contributed to the cost of the collection of the data. And I think that's something we might strive for in the offshore too, but by far, to me, the highlight was the Marine Exchange.

And I asked Ed a question when we were there and I kind of -- I know the answer but I felt I needed to ask it, and I said, do you ever get people saying, well gee, that's something the federal government should be doing, why are you doing that, that's something the federal government should be doing.

And deep inside the answer is probably, yes, it is. But it is not happening to the degree that is needed.

And I think it's a credit to Ed and the other Marine Exchanges, all the Eds. And it's a credit to the nation, too, and our kind of entrepreneurial spirit and our agility that lets the private sector, or nonprofit in this case, step in and meet that need.

And, at least from my perspective, and Ed might have a different view, seemed to be embraced by the federal agencies that you're actually helping because it is something that's helping everybody.

So I was just so thrilled to see that and I think it bodes well for the future. So, I thank you all for that.

RDML GALLAUDET: Thanks again for letting me join you all during this great meeting. I'm going to echo a bit and add to what Dave said about the Alaska Mapping Executive Committee meeting we attended yesterday afternoon, because indeed you're right.

This is the second time I attended that as a co-chair. And we took that initiative and we expanded the charter of this group to include the wet side, and it was very much a strategic move to get closer to the USGS and the Department of Interior.

And so that's something that we have made a priority at NOAA since I've been on board, October 25th of last year. And so, very exciting to do that.

And some things came up that I think this group ought -- should be mindful of. And that is, I know we tend to focus our discussions around the navigation contributions of hydrography, but there are many more and very important.

One occurred when I visited the Department of Homeland Security officials. And that is the importance of knowing the sea bed and tsunami modeling and planning. A real concern for this state.

And so charting in the Arctic and the Atlantic, or pardon me, in Alaska, is very important for that purpose, to improve our tsunami prediction and warning.

Another piece that wasn't addressed, but I'm very mindful of every day, is support to our fisheries and habitat characterization and conservation. And mapping is critical to that.

And then thirdly, as might have been discussed I think at some point during this meeting, is the need for mapping and characterization to implement the President's Critical Minerals Executive Order. Because there is no real, as USGS has noticed, there is no real boundary there at the shoreline, the potential exists offshore as much as onshore.

In fact, I thought it was really extraordinary, I read an article, a peer-reviewed journal paper that one of our scientists published, that the mineral potential of the Pacific, I think it's called crustal zone and the Clarion-Clipperton Zone, exceeds that of all terrestrial sources by three orders of magnitude. A thousand times.

So that's the potential we have offshore. And we are going to, we need to study that, map it and use that to our advantage knowing that we are 100 percent dependent on foreign sources for rare earth metals.

So, great opportunity here and I thank you for allowing me to contribute.

RDML SMITH: Thank you, Admiral. I wanted to take a different perspective on the Marine Exchange. I agree with everything that everyone said.

I guess what's tickling around in the back of my mind is, here is this really great nimble organization that's able to get the right people on board, have flexible IT, have authority to do things at the right time and the right place, be responsive to customers.

What is it about the structure of government that constrains us from being that guy?

And I'm looking a little to my left here for some thinking about on this --

(Laughter.)

RDML SMITH: -- because I think there are those things that we talk about, about ourselves, about backlog and hiring, IT systems that are too constrained, and we hear that all the time amongst ourselves. But when you add it all up, it keeps us from being that guy.

And I think that there's a loss to the American people as a result of that, of us not being able to be that nimble. So that's the challenge I will take home with me, is to try to be that guy and to keep making my organization as nimble as we can within the constraints of the law.

RDML GALLAUDET: I'll wager here, Shep, that you are that guy already and that, look at how much, what percent do you contract out for hydrography?

RDML SMITH: About half.

RDML GALLAUDET: About half. That's a great development that we want to continue. And so, I'm talking about public-private partnerships and seeking to partner more with the private sector.

The National Ocean Policy talks about leveraging the National Oceanographic Partnership Program, for example, which is a superb vehicle for that. And so we are moving forward to do just that, to reinvigorate NOPP and other activities like it.

And we're doing it in a fairly big way. So we realize that the government-only approach is not --- it's sluggish, it's not agile and so we're making, we're prioritizing that kind of cooperative effort.

And I can go into the details of workforce management and other things, but we'll have a discussion, but know that that's our aim is to not be that guy.

CHAIR MILLER: Shep, I would say, first of all you have to get a dog named Zoe.

(Laughter.)

CHAIR MILLER: Two things, or a couple of things I'd like to highlight, and the first one is the AMEC. First the IOOS group being with us, and now the AMEC group is just terrific in seeing how all these Panels can work together.

And the second one is, again, about working together. Things that I've heard here, from the water level panel, how critical water level is.

From Larry, what the new technologies are and what it's looking like. From all our stakeholders of, we need the flexibility and the agility.

From Shep saying that broadcasting weather data is a navigation issue, it's not a Weather Service versus NOS type of -- but that broadcasting data on an AIS is a navigation service.

And I'm thinking, particularly since I come from the mapping, or the bathymetry side, I think there are some potentially really good partnerships from the Allen Tours, from the tugboat people, with the type of technologies that Larry is talking about and then prioritizing small scale, really small surveys in areas of interests.

If we could get sort of a starter group on how do you put together a small survey system with the appropriate technology, not just necessarily multibeam, to meet these individual needs of small communities.

And I went back, and I used to work for a guy who is sort of crazy, but he was a pilot and he wanted to put a multibeam sonar in the float of a float plane. Now, there's another potentially wacky idea, but I think this Panel, and bringing together the three Panels, really does a lot for that kind of synergy of effort. Ed.

VICE CHAIR SAADE: Ed Saade. So, in no particular order, just listening to everybody and thinking about all this, my list starts off with Larry's presentation and application of the ASVs improvements.

And as I've always maintained, as the NOAA charting and funding that goes into UNH and invents all kinds of great new ways and new technologies gets absorbed by industry, we adapt all these types of things and go make a lot of money on things that were originally invented or produced through U.S. tax dollars.

And it's real obvious to me, with what's going on at UNH, here's another one that's going to easily be adaptable to lots and lots of applications. So I thank you guys for that.

And I want to reiterate on the merging of the data sets and the types of things that were being talked about with the AMEC presentation and the idea to take all this land and terrestrial data and take it right through the shoreline and start to merge it with the hydrographic data.

It's great, to me personally, to see this. I've been running around Alaska for about ten years advocating for this, trying to get people's attention on it because we were able to do this off California ten years ago with about 24 agencies involved and move -- do exactly that, to move the data right through the surf zone with the support of several federal agencies plus the state agencies.

And to be frank with you, it's been frustrating for ten years to not have anybody else pick up that momentum and keep doing it, so it's great to see.

And as Dave pointed out, having the Admiral on the Committee now, that's fantastic, because let's face it, the data that's going to get collected now to make this one giant database for Alaska is going to be really dominated by the marine environment.

So NOAA's participation is critical to make this happen. And with Shep's organization and Juliana's organization, that's right where all that merging is going to happen, so this is a really great time to see all this coming together, so thanks.

MR. EDWING: So, I'll certainly second all the things said about the Marine Exchange earlier but I will also highlight the AIS aspect.

As Glen said, we've been working with the Coast Guard for many years now trying to get PORTS data out over at the national level, and we've kind of been ready for a number of years and kind of waiting to take that last step.

Actually, in places where we did demonstration projects, Tampa Bay and Columbia River, that data is going out. It's continued to go out after those demonstration projects have been done.

So it was great to see how it's, you know, the work that's being done up here at the Marine Exchange and perhaps looking for alternative ways to get that data out.

And once we get PORTS data out, that just opens the door for NWLON and all sorts of other environmental data to get out there. And that was one of the original visions of AIS was, not just a maritime awareness, but also getting the environmental data out.

So, very much looking forward to working Ed and others to help move that forward.

And then the other thing I'll say is, I was also very pleased to see the -- our USGS colleagues here yesterday and the AMEC meeting in the afternoon, even though I'm not a part of that.

You know, USGS and NOAA are both science agencies, we're both working in the coastal areas. There's a lot of great complementary things we are doing and maybe could be doing or should be doing.

And there's actually a larger coordination effort going on right now between NOAA and USGS, based upon a meeting that was attended by the Admiral and at the highest levels of NOAA and USGS last year. And there's a number of themes that were created and then people are moving out on that.

But I think yesterday was just one really great example of that, you know, what that collaboration can achieve. So, thank you.

MS. BLACKWELL: I'm Juliana Blackwell. I was delighted to be able to have the Alaskan Mapping Executive Committee effort be highlighted during the session yesterday, as well as to be able to have the meeting in conjunction with our time here at the HSRP.

And I think being able to highlight those interagency cooperative efforts, and especially for the National Geodetic Survey, being able to highlight some of the other things that we do that we don't necessarily focus on when we talk about the maritime side, but the fact that the underlying information that NGS provides, is being used by other federal partners and is quite critical to work such as updates for topography, et cetera.

I really, really appreciate the fact that we have NOAA and USGS, Department of Interior leadership support, to continue those efforts here in Alaska. It also relates to other efforts that are happening in the other states, jointly with USGS and other federal partners.

So I think keeping that in mind because a lot of times we do hear negative things, how we're not working well together. And I think these are great examples in addition to what we heard earlier in the week, just how these different groups are working together well and how we are supporting each other. And coordinating where things seem to be a little bit blurry.

And I think what we mean by hydrography, what we mean at NOAA by hydrography, what USGS is referring to when they say hydrography. I think keep that in mind that words have multiple meanings and applications. And it's important to understand the context of what's being discussed.

So I think we're doing a great job of bringing those things together and ironing out those concerns that, what do you mean by that and how are we going to work together in this coastal space so that we make sure we're getting the most out of everything.

Also, just on my last comment, is on the subject of topography. Most of us flew into Juneau, or maybe other places first and then into Juneau, just keep in mind, it's really important to know where those mountains are and also to know where things are when you can't quite see them clearly.

It's really important to have that mapped and really appreciate the support of USGS of getting that work done here in Alaska so that we can all benefit from that. Thank you.

CHAIR MILLER: Thank you everyone for all the excellent comments. Next on the agenda is a brief update. We're running a tad late but we've got some elbow room later in the morning, so we want an update from our technology working group. Ed?

VICE CHAIR SAADE: I think they're queuing it up.

CHAIR MILLER: One thing while they're queuing things up that I neglected to answer, in my eight years with HSRP, that was the first time I've ever seen the amount of representation from USGS at one of our meetings. I don't know past that history if they've attended before but it was a really excellent chance to work together.

VICE CHAIR SAADE: Okay.

CHAIR MILLER: Yes.

VICE CHAIR SAADE: All right, I can read from my notes here. This is a summary of what -- oh, here we go, good timing.

This is a summary of what's been going on since we met in Miami. Next slide please.

The planned activities for the next six months, potential collaboration with the Science Advisory Board and other topics and ideas from anybody in the group. So we'll probably skip bullet four in the interest of time right now.

So, next slide. So, over the past five months or so we had a presentation on Chart of the Future: A Path to Textual Interoperability, Briana Sullivan, which was very much an e-version of the Coast Pilot. And I thought it was a really interesting presentation, really interactive.

It's also interesting to note that the folks that we saw on the panel earlier this week have memorized the Coast Pilot so much that they don't even refer to it anymore, so that's another hurdle and interaction we'll have to think about as this moves forward.

And then Ed gave a presentation on AIS through the GoToMeeting process so the general public outside of this group could get a feel for it. But obviously being in his office and seeing it firsthand is really where you feel the real power of it.

And then we had a couple of different detailed discussions with SAB, mostly with myself attending their meeting up in New Hampshire in July.

Next slide. We'll come back to this topic later on this afternoon, but the planned topics for the next six months, we want to have a GoToMeeting based on some of the requests and discussions with SAB, I'll get to that in the next slide.

And also, it's time for an update on Seabed 2030 status, data transfer updates. And we'll organize one of those for either in November, I think we were thinking, and then one other month, probably early January or February before we get together in March.

So, we'll position those two. And the technical discussion, we've asked Larry to have one of his staff or students talk about specifically multibeam echosounder and derived products from that relative to fisheries applications and things.

And of course, any ideas from the rest of the Panel, please speak up.

Next slide. So this is some of the feedback derived from the discussions with SAB and where the parallels or overlaps might be, relative to HSRP and SAB.

Two key items. Number one is leveraging hydrographic mapping and measurements for Fisheries uses.

For some of this in this organization, this is obviously already happening and it's being, growing more mature in larger applications all the time, but from the SAB side it was pretty apparent that was news to them.

So we think this is a really quick hit that's going to be beneficial to demonstrate how all these different varieties of ways that we collect multibeam data and backscatter and maybe some other real-time data acquisitions and generate the derived products that are immediately available, or quickly available and immediately applicable to what the Fisheries folks are doing and researching.

And then to increase that awareness in conjunction with SAB relative to what seems like a common activity for the HSRP people.

So, that first step is what we mentioned before, is to develop an informational webinar with invited speakers and make sure that those within the SAB that want to attend are aware of it and get that --- spend enough time during the webinar to ask questions and expand on all this.

Next slide. So the other idea that came up was taking all the data, basically the types of data that Shep's group and Juliana's group acquire and use that for forecasting and modeling conditions in nearshore, coastal, and estuarine navigable waters.

So this is a little bit less immediate. This is something that everybody is interested in and it's going to take time to develop and it's going to take a lot of interaction and discussion to be able to get a path on how to go forward with this.

So part of that is the increased availability of real-time data streams, computational platforms, data assimilation. All the different types of physical characteristics can be measured, waves, currents, tides, et cetera.

So what is needed to increase the development of such a multi-use forecasting tool within NOAA?

Well, that's a big question and a big picture and that's something that we'll -- the best we can do is kind of point people in the right direction and put together the right people in the two respective organizations to try and move this forward in much larger steps rather than just a wish list.

So the first step of what we agreed to, review the literature and continue discussions, develop the approach for articulating the set of best practices for multipurpose, nearshore, and estuarine forecasting tools. And that NOAA could utilize and leverage --- so you can see there is a lot more development and work to do on this one and we're going to do our best to keep the ball rolling on that. I think that's the last slide. Yes.

So that's a quick look at what we've been doing in the working group. If you have any questions or if you want to talk about it later today, whatever your pleasure.

MEMBER THOMAS: I guess I don't understand number two. But, I mean there is so much work being done in the forecasting realm right now.

Did they say they want to integrate all of the forecast products or --

VICE CHAIR SAADE: I think the desire was to take the data that is real-time now data and how do we start to build that into modeling. Now --

MEMBER THOMAS: Oh, so --

VICE CHAIR SAADE: -- if there are good examples of that, just like with the Fisheries Habitat Assessment --

MEMBER THOMAS: Right.

VICE CHAIR SAADE: -- if there are good examples that we can demonstrate back to them, the things that are already occurring, that would be the first step.

And obviously there's some types of things that are going on with the Weather Service and all that. But I think it was, not Weather Service-related, it was more to do with the types of things that are trying to predict long-term conditions along the coastline.

MEMBER THOMAS: And as it particularly pertains to the Fisheries, right?

VICE CHAIR SAADE: Not necessarily Fisheries.

MEMBER THOMAS: Oh, okay.

VICE CHAIR SAADE: There was, in the meeting in New Hampshire, there was a great term that was coined that I thought had captured a lot of things and it was natural infrastructure.

And in particular, for instance, the types of things that go on when we do mapping and charting for Shep's group, where you're mapping reefs and rock outcrops and things like that.

MEMBER THOMAS: So characterization ---

VICE CHAIR SAADE: That type of infrastructure that's natural on its own and how that ties into the whole big picture of infrastructure.

MEMBER THOMAS: Okay. Thank you.

VICE CHAIR SAADE: Shep?

RDML SMITH: Yes. I think there was one --- what I thought was quite an interesting but a little aspirational side of that prediction, which was prediction of sediment transport.

Which is pretty immature compared to hydrodynamic modeling or atmospheric modeling. But we have important data that could support that type of modeling for coastal stability and that sort of thing.

VICE CHAIR SAADE: Yes, I agree. And I think some of it is them asking the right questions that we don't necessarily ask.

We might have a lot of the data that can support it, but it's not necessarily something that's at the forefront of the way we think, in this group.

CHAIR MILLER: Any further comments on the Technology Working Group?

It sounds like you're making good progress. Okay, at this time, albeit a little late, I'd like to call up the Alaska Panel. I'm sorry, the Arctic Panel.

Ed Page and Ashley Chappell will be leading this session, and I will turn it over to them.

MEMBER PAGE: Testing, one, two. Anyway, I think we have a great panel up here now that I kind of coerced, to some degree, to come up and talk about Arctic issues.

But all subject matter experts from different perspectives, they've been there, done that in different fields. And I think that they're going to offer different perspectives of the challenges that we have for maritime safety, environmental protection and efficient maritime operations and the role that NOAA can play in that, facilitate, ensuring that increased maritime operations out here go well.

So, I'm first going to offer up Mike Emerson. He's a 1984 graduate of the academy, which is important because he's an even year, that makes him a good guy.

But I think the interesting perspective from Mike is that he's both flown for several, sailed on several Coast Guard ships but also then became a pilot, a C-130 pilot. So he understands that navigation issues from the aviation community, that some areas are ahead of the maritime community, and also the maritime community.

But as head of Waterways Management Senior Executive Service after 30 years, now he's Senior Executive Service for the Coast Guard, head of Waterways Management for the United Coast Guard. Which to me is overwhelming when I think of all the issues that he has between buoys and aids in navigation, pilot navigation, goes on and on.

And to get him up in Alaska to talk about issues I'm really appreciative that he'd take this effort to do so. And he also is a great social beer drinker which is even more important. He learned that in the academy too though so, we know how that works. Mike, please.

MR. EMERSON: Thanks, Ed. It's great to be here, Admiral, I appreciate you having us up. And thanks to my buddy, Ed Page, for inviting me personally. I've been trying to be like you for a long time.

Juneau is a great place for this meeting. It's a perfect waterway environment. It's the party hat of waterways.

I'm so impressed with the tour and the relationship with the Marine Exchange. And you're really taking market share from the Coast Guard and probably soon from Uber and other expansion opportunities, so good on you.

I'll say that it's very telling with a new Commandant that one of the first luncheon guests that he invited over was you, Admiral Gallaudet. I think it signals the great relationship that we have.

So I'm going to speak in broad brushes here today because we are already speaking with one voice. We're aligned on a lot of different areas, and I'll just emphasize a couple very quickly.

But the fact is, you coming over early on in Admiral Schultz's career really has made an impact. We've got requests from NSF now and Army Corps and others, to get to that executive dining room.

So, two things happening with the new administration and with the new front office and the Coast Guard. There's been a renewed emphasis, or a new emphasis, on maritime commerce.

So we are seeing the maritime transportation system and the efficiency and effectiveness and profitability and all of those things, safety, come up in every discussion that we have.

And I will tell you that as the director of not only the waterways management but also of navigation and marine safety, I am also a member of that hair club.

Next slide. To understand the waterways you have to be a user. And when you have a boat fire and it's efficiently put out by three response fire boats, the Metropolitan police and then the last blue light is, oh good, here comes the Coast Guard.

And they ask who's the master and I got everyone off safely, and they say, good job skipper, what's your name and I hesitated and my daughter said, tell them who you are daddy. Oh, no, no, no.

(Laughter.)

MR. EMERSON: So titles are not important here today. Next slide.

(Laughter.)

MR. EMERSON: But, it's more about action. And one of the things that we do is put together an Arctic strategy every couple of years.

We led the nation in looking at the Arctic and saying, we need a strategy, we need to have some accomplishment here. And we don't have to have just icebreakers, this isn't a strategy to sell icebreakers and get Congress to go, oh, keep up with the Russians.

It was really about having Arctic-capable ships, airplanes, boats, people. To operate in the Arctic you have to train in the Arctic and it's not a game show, as you all well know, this is a home team. And you've got to prototype the right resources.

So we are doing that in our strategy with a design on presence. We have to establish presence, and I think NOAA likely too, will have to increase their presence. And we're going to have to speak with one voice about how we do that. More on that later.

Next slide. What's new to the strategy and the current rewrite that's on the Commandant's desk and ready for signature, I'll suggest, is not only that we want to continue to modernize governments and play nicely in the Arctic Council, the Arctic Coast Guard Forum and play with the other waterfront countries in the Arctic, we want to certainly broaden our partnerships and work well with the interagency, the federal, state, local, tribal, with my good buddy Willie.

We also want to take a close look at security. There are threats to our sovereignty, there's new interests at the Department. The new S-1 now is looking at engaging all of the Homeland Security agencies.

An analysis and a strategy toward the trade activities, the Fisheries activities, the immigration challenges. Any of the emergent conditions you may have as waterways open and traffic increases and more tourism and more passports, et cetera.

So you're going to see more emphasis on security.

And I will tell you that there are legitimate concerns with freedom of navigation activities. The Chinese are operating throughout the Arctic. The Northern Sea Route, the Northwest Passage inclusive. And then even the Polar Route.

We've got a lot of research vessels and we've got a lot of area that the Coast Guard has got a responsibility to be able to respond to, to monitor, manage, and certainly respond to law enforcement or search and rescue.

Next slide. So at present, today, tomorrow and the day after, we'll continue to do a mobile and seasonal presence.

And we are -- you got a brief probably from Admiral Bell. I didn't see Tuesday but I know he must have commented on how he deploys a thousand people every year to Arctic Shield operations up on the North Slope. We operate out of your hometown, Kotzebue, Willie, and we fly aircraft up and down the coast, we have liaisons talking to remote communities. And we continue to work with our interagency partners, NOAA as well, gathering information.

We need data is a common theme that we hear. We help you collect it with the Healy and with putting science teams on.

Again, with that great relationship, just a couple of years ago when I took over the reputation of the Healy front four of the command on the Healy, was not so flattering. The scientists felt like they were second class citizens and like they were civilians at headquarters.

And we've, I think, changed that. They just finished the first semester of the summer with the scientists, and I got unbelievable accolades from some of your leadership that said that everyone was treated so well.

Great relationships, people taking initiative, working well together, and so this is a good time to play nice, I like it.

Next slide please. The strategy for the Arctic certainly includes the icebreaker. And we've made no secret that it will have sensors, it will have weapons, it will be able to gather information.

It's a transport vessel, but it's also going to continue to be an asset that's useable for the interagency science and academic communities. It does have the cranes and the deck space and the modularity to be able to take on different science equipment and deploy those and work with unmanned surface and undersea and air assets and do a lot of different R&D efforts.

And it's going to have weapons. And we can talk more about that if you like, but building six of them.

Congressman Garamendi and others continue to signal that we're going to pay for these, we're going to get them, so we're feeling fairly confident that as we build out the other ships that you've heard about, we're going to build the nation's primary ice-capable surface fleet that gives you the visible presence. And it goes back to having waterways and being in those waterways, being visible.

Next slide please. There's a cerebral aspect to the Coast Guard, the prevention side that Ed's mentioned a number of times. And this is the part, the world that I work in.

We recently conducted an important analysis --- we didn't recently, this is a ten-year-old effort. Some of you have been around this for a long time.

And this was a project that we engaged initially with all the remote communities and agencies and government officials in Alaska, and then we extend it over to discussions with our neighbors to the west and put together some recommended track lines.

Voluntary routing system. And then we acknowledged and dignified at IMO some areas to be avoided. And so far we have just one remaining area near the center of the boundary line that we need to get approved. That's on the slate for this coming session at IMO that starts in October.

But, there are many different information areas that you could put under the word planning. Looking at the Bering Sea in this ten year study effort really gave us a sense of what the traffic is, what the infrastructure requirements are, the Aids to Navigation, what opportunities there are for leveraging new technology for continuing the science effort and getting that good PORTS information formalized.

And then taking that effort, the next step is taking that to the North Slope, and as the Northwest Passage emerges, we'll already have the planning in place.

Next slide. So my wrap-up here is that there are a lot of places we could collaborate. I hit them in broad strokes, I know that, but we need a joint voice on how we establish ourselves, maintain a presence, or sometimes establish one.

But speak with one voice on planning. How we use the U.S. areas, the offshore areas that are source, potential sources for resource development. So, how we lease those.

We're going to have to do some planning there and interagency coordination. Look at the R&D opportunities, and we've talked about some of those unmanned capabilities and what have you.

Increased awareness is a good cue for mentioning electronic charts, moving maps. All of the bridge management systems now are way smarter than the car I drive and some of the -- even my ten-year-old computer.

These new systems are all dependent on good information. And everything that we've approved policy-wise and electronic charts, we've said they have to use NOAA data.

So, you all have to help with us in making sure that those products to the public are good and that they contribute to marine safety. Certainly, we've talked about PORTS over AIS and other electronic MSI, Marine Safety Information technologies.

And finally, infrastructure. My comment here is, one, it's a little bit edgy but the State of Alaska and others have asked us, do you need a deepwater port, and of course we can't say that because then we'd be asked to pay for it. Probably NOAA has the same challenge, and even DoD has the same challenge.

But if we all indicate very strongly that the State of Alaska needs a deepwater port and the State of Alaska needs nav aids and communication towers and lower earth orbit satellites, et cetera, then we'll start to get some momentum. I think that's what the Congress is waiting to hear and hopefully waiting to fund.

My sense is that, Admiral, there is a good relationship with the Coast Guard, I hope it continues, and I'm certainly on board for helping to align us on any of the projects that this review puts up. Thank you.

(Applause)

MEMBER PAGE: Is it working? Yes, okay. Thanks, Mike. Willie Goodwin is a good friend, Alaskan Native.

This is his backyard, the Arctic is his backyard. He's well respected, he's one of the Native elders up there in that region of our Arctic.

He's fished and whaled and lived up there, but also has some time in the lower 48, or in this area at Sitka, he went to high school at Sitka, Mount Edgecumbe. But he's really from the Arctic.

And his demeanor, his ability to work with others and his leadership have lead him to be the Chairman of the Arctic Waterway Safety Committee, which brings in all kinds of representatives from the maritime industry and the people who live up in the Arctic, and agencies to kind of collaborate and come up with standards of care and good marine practice and come up with products that enhance maritime safety, environmental protection so that his neighborhood is not negatively impacted in the future by increased maritime activity.

So, he came all the way from Kotzebue here and I'm really grateful you made this trip and always good to see you and hear your perspective. So Willie, if you would, please tell us your perspective on this. Thank you.

MR. GOODWIN: Thank you, Ed. And I'm very happy to be here. Good morning, my name is Ergogat (phonetic), my Inupiaq name. My nickname is Willie Goodwin.

Two hundred generations I believe, at least in my area, have inhabited the Cape Krusenstern National Monument. And that's what the Park Service did a paper on, 200 generations of human habitation in the monument.

But I believe it goes further than that because we were once called mammoth hunters and now we're caribou hunters. And the stories I've heard go much further than 200 generations.

I am part of the Kikiktagruk Inupiaq or Kotzebue area from the Malamute Inupiaq people of Alaska. My region, the area I'm from, is the size of Indiana with about 6,800 people living within that area, which includes the coastal areas and the rivers that come in.

I am Chairman of the Arctic Marine Mammal Commission and the Arctic Waterways Safety Committee. I'm here to tell you a little bit about how we deal with protecting the Arctic waters that are so vital to the survival of the Inupiaq and Yup'ik people.

You know the rest of the world has just found out that the Arctic is changing. For those of us who live there, change is pretty much all we've ever known. We have adapted to many changes we have faced for thousands of years.

First came items like iron, tobacco, outboards, new hunting practices due to climate change. We have used these changes to our advantage and would like the opportunity to participate in today's changes because we have no choice but to adapt. And we are very good at it.

No matter how it changes, the Arctic is harsh, so we watch out for each other and share what we have and what we know.

Next slide please. The first step to developing safe practices for Arctic waters is becoming familiar with those who are on the water and why they are there. Local communities are increasingly having to share the water with developers and researchers.

Next slide. For those of us who live there, we are part of the natural world. We follow its seasons.

The animals provide our nutritional health, we know our ecosystem and we know our fellow creatures like we know each other. Our social systems are built around the ecosystem in which we live.

This is part of our heritage as a subsistence hunting culture. We depend on the Arctic ecosystem for our food security, for life itself. And because it is always changing season to season and year to year, we survive by adapting to those changes.

Our local residents need subsistence resources to remain available for hunting. This is why we are talking about, when you hear us say that we are concerned about our food security.

Protecting the availability of our resources and our food security is written into federal law in Section 101(a)(5)(a) and (d) of the Marine Mammal Protection Act.

But working to protect our food security doesn't mean that we oppose development. Development can bring jobs to our communities and these opportunities are important to us.

We are happy to share our region with development interests and scientists conducting research when they are willing to work with us on resolutions to conflicts that bring shared opportunity and success rather than win-lose outcomes.

Next slide please. With recent increases in Arctic vessel traffic, the Arctic Marine Mammal hunter groups came together in 2012 at the request of the U.S. Coast Guard to form the Arctic Marine Mammal Coalition, or AMMC.

The Coalition is comprised of the five Arctic Marine Mammal Hunter Co-Management Groups, the Alaska Eskimo Whaling Commission, the Eskimo Walrus Commission, the Nanook Commission, the Ice Seal Committee and the Alaska Beluga Whale Committee.

True to its mission, the AMMC has been successful in providing communication and education between Arctic coastal communities and the U.S. Coast Guard, NOAA, and other regulatory agencies on issues related to the expected impacts of increased ship traffic in the Arctic, on our way of life and subsistence activities.

A large accomplishment of the AMMC has been to bring together the Marine Mammal Groups with municipal government, the Alaska marine pilots, vessel operators, the tourism industry, researchers, and oil and gas to form the Arctic Waterways Safety Committee.

Other areas of the U.S., coastal U.S., have similar stakeholder groups usually called harbor safety committees. The purpose here is to create a stakeholder process where those using the waterways can reach consensus on safe practices for local marine areas.

The Arctic Waterway Safety Committee is composed of a wide array of Arctic maritime users and stakeholders that fall under three categories: subsistence hunters, industry, and other representatives. Each category has five seats and each with a vote on decisions made by the organization.

Next slide. The area of interest for the Arctic Waterway Safety Committee extends from the St. Lawrence Island, north along the Arctic coast of Alaska to the Canadian border.

We were formally incorporated in October 2014 and meet two times per year. We have developed a standard of operating care for research vessels and are in the final stages of completing the waterway safety plan.

The U.S. Coast Guard has acknowledged that the Arctic Waterway Safety Committee is a key player in waterway safety and will be able to look to these safe practices as they develop measures for managing the increases in Arctic vessel traffic.

Next slide. The marine mammal hunter groups, especially the Alaska Eskimo Whaling Commission, work with NOAA to provide information on sensitive areas for publication in the Coast Pilot.

An example of that is the timing of the hunts and contact information should vessels be in the area during that time. We also provide VHF channels and provide buffer areas for communities.

Funding and capacity have been an issue in providing the Coast Pilot with updated information. I think you will see the hunter groups providing more detailed information in the future as we complete our safety plan.

The next slide. For us hunters, real-time ship-to-shore communications is vital to our safety and the protection of our resources. There are areas that need to be respected for our subsistence activities, not only during our hunts, but during the migration of our marine mammals.

Right now, information is difficult to access. It relies on vessel operators' knowledge and adherence to the Coast Pilot. If operators could communicate in real-time with our communities, it would be very helpful to us.

The next slide. As I said before, the Arctic, in our communities, rely on the resources from the sea for our survival.

For us, it isn't just economic gain or results from research that are at stake. We have seen a dramatic increase in marine traffic and impact to our communities is significant.

We must continue to work to plan solutions that avoid environmental mistakes. The knowledge and experience and the culture of sharing and adapting found in our local communities is a very large part of that.

The Alaskan Native subsistence hunters must be included as part of that solution, and done in ways that are possible with the limited resources for those communities.

I would also like to personally give a big thank you to retired Commander James Houck, who led us through this process as we tried to figure out what we need to do when we started to see large ships. Thank you.

(Applause.)

MEMBER PAGE: Thanks again, Willie. Next is Paul Fuhs. I could talk about an hour about Paul Fuhs, but I better not.

But we do go back 35 years, back when, a little bit more destructive relationship, when I was involved with Marine Safety and the Aleutians and Paul was mayor of Dutch Harbor. But on a side business, he was building the community, but destroying ships for us. So he took his skills as an underwater diver and explosives expert and blew some ships that were problematic environmental hazards in the Aleutian Islands.

So we had some pretty colorful times back then. And, over the years, we've had more mellow types of relationships, traveling to the Galapagos Islands, I've been in Norway and Iceland and in Alaska. But he's also, was very instrumental and is our president of the board for the Marine Exchange of Alaska, and he was there, when we sat down, in a bar, and drew up the plans of starting the Marine Exchange.

So he's been key as far as what we've developed over the years, been a great friend, but also a mentor and a great leader. But he's involved in so many aspects of Alaska. He was commissioner of the Department of Commerce years ago.

And so he understands the blue economy, if you will. He also understands the importance in protecting our environment, having been involved in many marine casualties, including Exxon Valdez spill. So, Paul, please do.

MR. FUHS: Thank you. I think I'll go ahead and stand, if you don't mind? So, I want to just say how proud we all are to have you all here and to hear the important work that you're doing. And some of the things I want to talk about today is how we might take some of your work and make it operational for the vessels. I think that's really important that we have that transmission capability.

I do want to point out that the Marine Exchange, it was not because of some government regulation, or some reluctant or resistant industry. Industry took the lead in putting this together, because of our shared commitment to safe, efficient, and environmentally responsible operations. So, our board represents the entire industry.

So I've been speaking a lot about these Arctic issues, even to our school kids, and to try to bring awareness to them. And one thing that struck me, as I did, was the importance of maps. And I know maps are really important to you. It's one of the most important communication methods that you have. And, just an example of how powerful maps are to our consciousness and understanding of the world, here's a map of the world.

And, even for sixth grade kids, this is really disorienting for them, and for us. And of course, there's no up or down in the world, it's round and we're floating in space, but our concepts of maps are more like this.

And this is what we grew up with. Well, that makes us feel a little more comfortable, but it's still a distorted picture of the world, because this is what we call the Mercator mentality that we all grew up with. At least this map doesn't have Alaska in a little corner, down on the edge.

(Laughter.)

MR. FUHS: But, you know, it's really, you know, this is the view of the world that we want to show. And this really shows the connectedness of the Arctic. And, in economic terms, it's really important, because 80% of the industrial production of the world takes place in the northern hemisphere. Yet, currently, we're stuck with two inefficient and problematic routes for transporting our goods for trade.

So, what's been looked at a lot more is a northern sea route, Arctic operations. We're seeing increased traffic. What we're going to see here is -- and this is for container operations, which is the next breakthrough for a real world trade route.

To have a world trade route, you really have to have container operations. And this is using Adak as a hub, connecting northern sea route traffic to the Great Circle Route traffic, which would probably be the most efficient way to do it.

This is a lot of the traffic that's happening right now. This is Russian LNG production coming across. There's going to be 13 vessels doing this. You see the savings of about 20 days.

And, you know, one of the other options that this represents is that, if we can put fueling stations, we can actually replace some of the more polluting fuels in the Arctic with LNG, if we can use these ships to create fueling stations. Athis is another thing the IMO is looking at right now is heavy fuel oils.

So, you know, a lot of this is facilitated by the use of icebreakers. And one concept we're working with it "Uber for icebreakers." There aren't that many of them, so what we're looking at is, you know, those that are available should be available to be used, especially in an emergency situation.

Now, this looks like a pretty big vessel. This is about 25-megawatt nuclear icebreaker. But the next iteration, the two that are just coming off the ways into service are 65-megawatt icebreakers and there's a 110-megawatt that the keel has been laid and it's going to be coming.

So, the shippers on the northern sea route for containers operations tell us that we need to be able to guarantee at least six months a year operations before they'll change their distribution patterns. So, because of this, prevention is absolutely critical.

And, why? Oil spill response is limited, infrastructure is limited, you know, marine mammals, the index species live at the surface of the water, they'll be most heavily impacted by a spill. And, as Willie Goodwin pointed out, that's what they're depending on for their food. And the financial and environmental costs would be just catastrophic.

So, one of the things that -- and I don't know how many people here work in oil spill response, but if you were to guess, in good conditions down south, what would be considered to be a very successful cleanup operation of oil? What percentage of the oil would you think would be considered very successful? And the amount is five percent is considered a very successful oil spill operation.

Well, that's just not acceptable in the Arctic. So, back in the days when I worked with Ed, how did we do pollution prevention? Well, this was when I worked as a diver. Well, I was a little bit younger there. Look at that, I'm even smoking. Holy cow.

(Laughter.)

MR. FUHS: But, you know, what we do, because of lack of oil spill response and because a vessel would wreck on the beach, had fuel onboard, and it was risking another vessel to try to come in and save it. Then I'd come in and, you know, load up all the tanks with explosives and incendiaries, and this is 160,000 gallons of diesel going off at one time.

And it was so effective, there wasn't even a sheen on the water afterwards. So I think we did, like, eleven ships like this. But they don't let you do that anymore.

(Laughter.)

MR. FUHS: So, you know, that's why, you know, these other measures are so important, our safety measures. Now, these are the prevention measures that we currently have in place. You saw a lot of these at the Marine Exchange.

Vessel tracking, monitoring, early detection of problems, rooting measures, vessel of opportunity, who's the next nearest vessel that can help? These are important.

Improved hydrologic-meteorological data, transmission of this data to the vessels, and some international agreements for prevention measures. Because there's about eight nations in the Arctic involved in this Arctic shipping, and we need to have more harmonized regulations and agreements on this.

Mariners like it. It's easier to get compliance if people know they have the same regulations and expectations wherever they go, rather than going one mile further and now I'm a completely different regime. So, that's important.

And NOAA can play a very important part in this, because you play a very critical role in the Arctic Council Committee on Protecting the Marine Environment, and, right now, they're involved in a best practices process to identify best practices. And one of your mates, Peter Oppenheimer, is the co‑chair of that committee, so we're hoping that we can get support for putting these U.S. measures forward as best practices.

They have been adopted as alternative planning criteria by the U.S. Coast Guard, so we're hoping today to seek your agreement to help put these measures forward.

Well, we've talked about dynamic resource protection here. Well, this is when Shell was operating, and we came in and this was a conflict avoidance agreement with the marine mammal hunters. And we can digital fence any area, and that's what we did in this area here. I'm sorry you can't see the pointer. But this was the area where they agreed to not go into, and, you know, we assured that they didn't go into it.

For part of this, because of marine mammals, people have said, well, let's make marine‑protected areas, but these animals move around. So you need to be able to really say, "now they're here, now they're there, here's where the hunting is."

Willie's been documenting the changes that have been happening up there. So we really need a dynamic process to do this, and that's one of the capabilities at the Marine Exchange.

The other thing we're doing is protecting all the fiber optic cables. So we digital fence these. If they ever get a break in the fiber optic cable, they come to us and say, where's the intersect with the vessel?

We've had a couple of them, one was a Coast Guard vessel on Puget Sound, one a commercial vessel in Cook Inlet drug anchor and separated the line. But we tell them exactly at that moment where it was, so they can go find and repair it. They don't have to pull out thousands of miles of fiber optic cable to find it. So, I know this is the backbone a lot of your systems that you use to transmit your data, as well.

These are some of the international organizations that we've been working with. The Polar Code has been adopted. There's a section in the Polar Code on operations manual and navigation. So we're hoping, if these best practices can be identified, those could be included in the voyage planning for voyages in the Arctic.

These are some of the weather stations that we've put in. And I want to give a big thanks to AOOS that's provided a lot of the funding for these weather stations. And, you know, as we heard, we've been doing this and effectively sending the data and other data out to the vessels under a research agreement.

We need to take the next step where we have the permissions to be able to do this on a permanent basis. And I understand that there are some other parts of the United States that really aren't interested in it, but hopefully we can come to an agreement that the areas that do want to do it, can. If the rest don't want to, they don't have to, but at least we'd have the permission to be able to take some of the data that you folks generate and make it real for the vessels: ice data, hazards to navigation, marine mammals, weather data, all of that.

Again, you heard about virtual buoys. In ice, you can't put a physical buoy, so we're able to digitally generate buoys that they can see on their AIS Guidance Systems. We're able to provide for the hunters out in the Arctic, for vessels can see them and they can see the other vessels.

This is a speed zone at Glacier Bay, and where whales concentrate and they used to send out there with a Zodiac and a radar gun, but now we do it like this. If somebody violates the speed limit, a report automatically goes to the vessel owner and to the National Park Service. The vessel owner, if it's a captain that's not following the rules, it's going to get on him. For the Park Service, if you violate it enough, you're going to lose your right to go into Glacier Bay. So we call this the truth serum.

And these are the routing measures that were adopted by IMO, but, as is pointed out, they are voluntary and we do think that they should also be -- have their regular tracking and monitoring activities that we have.

And, you know, what we do is, you know, we can, as a regulatory body, tell somebody, hey, we're in the wrong area, but when we tell them, they voluntarily move. It's kind of like, you know, an airplane coming into the airport. You've never heard a pilot complain about somebody saying, hey, you're on the wrong runway or you're about to run into somebody.

So, we never get, you know, kicked back, and often they just say, hey, thanks, it's nice to know someone's watching our back out here in the middle of nowhere.

So, these are some of the barriers and solutions. We do need these permissions for data transmissions. We need to verify marine mammal data so that we can do the digital fencing. We need to install some more transmission equipment.

Now, this AIS software and hardware, IMO puts out a protocol of what your AIS system has to be able to transmit and receive. And, to this point, they have not made that protocol to be able to receive it. So, some manufacturers do, some manufacturers don't.

So, a recommendation to IMO to upgrade the requirements for software to be able to receive meteorological and other safety data is important. And then these international agreements for implementation in the Arctic.

And I guess that's it. So thanks, again, for coming. I look forward to working together with you.

(Applause.)

MEMBER PAGE: Thanks, Paul. The next speaker is Jay Sterne. Jay and I first met on a plane flying back from Barrow, which is now called Utqiagvik. But he was working for Senator Murkowski, at the time, and Fisheries.

And he's got a lot of experience and knowledge in Arctic issues and works with the Port of Nome and other Arctic communities and I always enjoy sitting down with him. I always coming out a little smarter after talking to Jay about all these issues. But he likes to make things happen and it's good to have his profound knowledge shared with us on some of these issues that we see coming down the pike. So, Jay, if you would, please?

MR. STERNE: Thank you, Ed. I think the first thing I'll say is, I'm president of Windward Strategies, which is a one‑person company based here in Juneau. Our second employee, I think, will be called Zoe, Jr., based on what I've heard.

(Laughter.)

MR. STERNE: But thank you, Ashley, Lynn, Madam Chairwoman, Admiral Gallaudet, Admiral Smith, the HSRP Panel, thank you for coming to what is now my hometown of Juneau.

Prior to moving to Juneau last year -- so I am very much a newcomer compared to you and Molly -- I lived for 25 years in D.C., as an attorney, lobbyist, Hill staffer. But I thought I'd go a little bit further back to explain a little bit why I've always gravitated toward marine environmental issues.

Before going to law school, I was the varsity sailing coach at New York Maritime College, and I spent about 300 days out of the year on the water, largely on the East River, sometimes over by Kings Point where, I think, Ann and I used to compete against each other back in the college days.

And I would get these tar balls washed up onto my docks, up on the small 420s. And I was a punk kid at the time, and I would get into this beat‑up Boston Whaler and I would go over to the Coast Guard Fort Totten Station. And I had the audacity to yell at Coast Guard officers about how terrible it was that these big tar balls were just getting discharged into, you know, the East River and washing up on the deck.

I was told that it was really difficult to address this, from the Coast Guard's perspective. They didn't have the regulatory authority, they didn't have the physical capability to go after a lot of the materials being just pumped out at night while the coastal fuel barges are going through.

In a small way, that lead me to go to law school and I wanted to get involved in marine environmental issues. So, here I am, a few years later.

One of the things that I was asked to talk about is infrastructure, maritime infrastructure in Arctic, and why do we need it?

And, when I first got out of law school, I worked on international marine and environmental policy issues in D.C., and I found it very interesting the different legal regimes that applied to the Antarctic and the Arctic.

And it was really, really very simple. People live in the Arctic. And, as Willie said, they have lived there for a very, very long time.

And in order for people to live and thrive in the Arctic, in the U.S. Arctic in particular, you need to have infrastructure to support them.

So, as you have spent a little bit of time in Juneau, if this is your first time in Alaska, or if this is one of many trips, you know that logistics and getting things done in Alaska are extremely challenging. And I think what the Marine Exchange has been able to achieve in its short life span is a real testament to the creativity and the work ethic to respond to those challenges.

So, maritime infrastructure in the U.S. Arctic needs to support the peoples and the communities. They've got to address the increasing maritime traffic. And I'm not going to be repetitive with a lot of the information that's already been shared in the last couple of days.

I also want to highlight the fact that there is growing strategic interest. As Mike said, you know, there are a lot of countries that are starting to pay attention to the Arctic, and the U.S. has a very strong invested interest in being a stabilizing force. There's also significant natural resource potential, both on- and offshore. And then, as we've heard quite a bit from this panel, there are unique challenges in responding to a maritime incident and, and, particularly, an, and oil spill.

So, one of the things that I was exposed to, again, right out of law school, was the 1992 Rio Earth Summit. And the term sustainable development" is a little bit, I think, sometimes forgotten, but also a little bit misused. But the very first principle really underscores that sustainable development means allowing people and communities to thrive in a natural environment.

And I think that's one of the most significant challenges in the Arctic. It's relatively pristine, the logistics are challenging, and people have a vested interest in cultural history, but particularly with subsistence fishing and hunting. If you don't have a pristine marine environment, you don't have marine mammals. And if you don't have marine mammals, you don't have food security.

I can't say it anywhere nearly as eloquently as Willie does, but I can't underscore enough how this impacts logistics, infrastructure, planning, U.S. federal policy, international policy.

So, I've touched on some of the core issues to address, hunting and fishing on a subsistence level. Commercial fishing in the U.S. Arctic is becoming an increasing topic of discussion. As the marine environment changes, it gets a little bit warmer, NOAA is doing quite a bit of survey work, further north in the Bering Sea and up in the Bering Straits region. And that may lead to increased commercial fishing activities for some of the main commercial species that are caught in the Bering Sea: cod, pollock.

And if that starts happening in significant volumes, then you start looking at, do you bring the product to shore, is it going to be processed in shore‑based processing facilities, as it is in Dutch Harbor? Or, if it's going to be catcher-processors, who are then, you know, operating offshore and then bringing frozen product that has to get transshipped out of the region.

We talked a lot about the regional marine transportation. One of things that I want to highlight is, for remote communities that are not connected to the road system -- and if you're not familiar with that term, talk with anybody who lives off the road system in Alaska.

That means a lot of your goods, household goods, you might have a dishwasher delivered by Amazon Prime by a barge. You know, you may buy a car on CarMax, but you don't have a CarMax in your village, so that's going to be delivered by barge. Building materials, gravel, all of that, and particularly, diesel fuel. You know, the hope in the future is that more renewable resources and LNG may be available for these communities, but right now diesel is the life blood in the winter.

Onshore resource development. You've heard a little bit about the red dog mine. You've got to get that product out, so you need a port. You need a port with very good charts so that vessels coming in and out of there, very large vessels, don't run aground.

Offshore resource development. I'm not going to go too much into offshore oil and gas exploration in Alaska. That could be its own two- to three‑day seminar here. But I will highlight that when Shell was active in the Chukchi Sea the vessel traffic was very, very robust, and it lead to crowding of harbors, it lead to the Fennica incident.

I thought that was a very good characterization, early on this week, about how the vessel traffic dynamics in Dutch Harbor changed, because it hadn't been that crowded. A lot of the traditional anchorage areas, you know, were at capacity and a vessel straight out of, you know, what they thought was a safe lane. And, you know, that had a significant impact.

The other thing that I'll mention, because this is a NOAA meeting, when Shell really ramped up, so did NOAA. And one of the areas that they were really trying to get ahead of the curve was, if there were an incident, if there were some kind of an oil spill up into Chukchi, how would you respond to an unusual, or large, marine mammal mortality event?

And this speaks right to the coastal infrastructure. I did some briefings with the Office of Protected Resources, and one of the challenges that they identified very quickly going into some of the coastal villages is, how do you get power down to the beach? How do you get volunteers up to the impacted site? How do you cage a polar bear and de‑oil it?

There are a lot of challenges that you don't face in the Gulf of Mexico where it may be, you know, relatively simple to get vessels, people, and equipment onsite to address these problems.

National and homeland security missions. Very recently, Commandant Schultz and Secretary of the Navy Spencer did a tour up in northwest Alaska. They stopped in Nome, and really highlighted the growing, not just interest, but prioritization for both agencies to have a physical presence.

We've talked a lot about icebreakers, but I'll take a quote from Secretary Spencer, who acknowledged that since the 1960s, the U.S. Navy has had a physical presence in the U.S. Arctic, and in the international Arctic, as well, but that's been submarine presence. And what he said is needed now, with the Chinese and the Russians and many other countries operating there with their icebreakers, is what the U.S. needs is big gray ships with even bigger American flags.

And, you know, with NOAA's increased operations, with the Coast Guard increasing their operations up there, what you need is some shore‑based infrastructure.

We talked about protection of the marine environment. And the other thing I'll mention, in that context, is that if Shell, or any other company, never comes back to the Chukchi or the Beaufort, oil and gas exploration is going to continue to proceed on the Russian side of the boundary, and there are no fences. There may be electronic fences to keep vessels away from marine mammals, but we haven't come up with an electronic fence that's going to keep an oil spill that occurs in Russian waters away from Alaskan waters. And that's a big problem.

And when I worked for Senator Murkowski it was one of my biggest frustrations about certain stakeholders, outside of Alaska, really pushing back against the development of shore‑based and response infrastructure. You know, their assertion was, it's not a good idea to do oil and gas exploration in the U.S. Arctic. Agree to disagree, but, with what's going on in Russia, you have to be prepared for some pretty significant consequences.

So. what are some of the drivers for U.S. policy? It's been great to see multiple agencies here. It's been great to see members of the Alaska congressional delegation, the Senate Commerce Committee. We've got representatives from the Governor's office, we've got others who have come in from the State of Alaska, Alaska‑native organizations, and I'm hopeful that there are regional and local governments that are online through the webinar process.

It really takes collaborative input. It really takes cooperation. Because, again, it's really hard to get things done in Alaska. Permitting, timelines, logistics, construction, all that drives up costs, and that's if you're in a perfect world of alignment with policy interests.

So, you know, I really encourage everybody around the table and in the room and those listening to try and find those areas of common ground, work with the Alaska congressional delegation, you know, Senators Murkowski, Sullivan, Congressman Young, the Dean of the House, they are all tireless advocates for the Coast Guard, for NOAA, for getting things done in a very proactive way.

But it's that level of effort that is often necessary to get even some of the basic local infrastructure. And I'll talk a little bit more about ports and harbors in a second. But, because this is HSRP, I thought I would highlight from the top of the list, NOAA's number one priority, you know, getting that charting done. And I've really appreciated hearing, particularly, from Admiral Smith, that it's not just about the percentages, it's about getting the right areas targeted and completed.

And I think some of the stakeholders that were on one of the earlier panels, you know, talked about the information and the data that is most critical to them, and synthesizing that and prioritizing that ‑‑ there are limited resources. And having worked on the Hill, even with the, you know, championing effort that the Alaska delegation brings to the table, there's only so much money to go around, and there are only so many resources that can be put out on the water. But I really believe that this should be an all‑of‑the‑above‑effort.

NOAA's vessels, they're current tireless champions on the sea. There are private sector vessels, other vessels of opportunity, at the federal level, and then outside source data, you know, as cloud-sourcing, or taking in data and getting it to a level of confidence. I thought, you know, some earlier commentators have expressed concern about only being able to rely on the best data. You know, somewhere, I think, as Ed had said, you may not get the gold or the platinum standard, but you get enough up there that allows for safe maritime operations.

So, we've also heard about how important it is to bring this mapping to shore, because that's where the vessels are going and that's where the people are. And if there's a response, or there's an incident, that's going to be very important.

VICE CHAIR SAADE: Ten minutes.

MR. STERNE: Other NOAA‑related ocean data and infrastructure that's very important. Always glad to see Molly here and talking about AOOS. The data buoys that they put out providing real‑time wave and other condition information is critical and it helps improve safe marine operations, it reduces risks, and, at the same time, it's important to try to understand how the marine environment is changing.

One of the entities that's not in the room right now, they may be listening, is the Army Corps of Engineers. If you're going to build a big port anywhere in the country, you're going to be working with the Army Corps, unless you're, you know, Paul Allen or Jeff Bezos and you're just going to self‑fund it.

(Laughter.)

MR. STERNE: They haven't shown a lot of interest in coming up for that kind of work, yet.

But I wanted to highlight, again, it's very difficult to get things done from a federal policy standpoint in Alaska.

Typically, ports, around the country, when they're competing for federal money, or getting in line for an expansion, or any kind of work, they go through a national economic determination.

And this is a really painstaking, complex process that basically looks, you know, how much freight's coming in and out, you know, what are the quantifiable economic benefits that would justify spending federal money, with a local cost share? With the exception of Anchorage, Dutch Harbor, and Valdez, that formula, that benefit cost ratio, really doesn't pencil out very well in Alaska.

So Congress has given the Corps authority, not just for Alaska, it works in other areas that are defined as remote and subsistence, but it allows -- and I won't go through the long list of criteria -- it allows for broader socioeconomic, environmental, and other regional economic factors to be taken into consideration by the Corps, and then producing a feasibility study that may rise up to the level of a Chief's Report and get the blessing of the Corps, and then the funding of the Congress, hopefully.

So, it's tough. And even though Congress has given that authority to the Corps, the Corps is very used to doing business a certain way. So they still have to go through the NED process, but, you know, for a lot of ports and harbors in northwest Alaska and up on the Slope, this is the only path forward to get the Corps involved in a project.

There's other language that has been included by Congress, and I wanted to highlight this, because it starts to bring into these factors also national security and homeland security interests, so it brings in Homeland Security, Coast Guard, and also the Navy.

The National Defense Authorization Act Fiscal Year '17 established criteria for the Pentagon, in consultation with the Corps, Coast Guard, and MARAD, to look at potentially designated Arctic strategic ports.

And, again, I won't go through the long list of criteria there, but the middle bullet talks about a lot of shore‑based infrastructure. And I think that's where one of the real challenges is. I mean, you need airports, you need hospitals, you need communications infrastructure, and the ability to dock, you know, a big Polar-class icebreaker, an Arleigh Burke-class destroyer, or a national security cutter.

You know, Paul mentioned the IMO. I'm going to highlight just the port reception facilities. As the IMO Polar Code ratchets down on what is allowed to be discharged into Arctic waters, you're going to need a rest area, and you're going to need to have shore‑based infrastructure so vessels can come to shore.

And Shep last night talked about, you know, improved design for some of the NOAA vessels to be able to stay at sea for 21 days. After that 21 days, I bet they really want to get to shore and replenish, so to speak.

So you're going to need that community shore‑based infrastructure. You need airports with regular jet service so, you know, if your vessel breaks down, you can get parts out to remote areas.

Hospitals for crew members. I'm not going to talk about how challenging it is up in the Arctic. If there was a real serious incident with, you know, several hundred or 1,000 crew ship passengers, like when the Crystal Serenity went through. The capacity of even the largest regional hospitals is really going to be stressed out.

Communications, the Quintillion fiber network really ups the game in the area. Utility infrastructure. You got to have power. Housing. If the Coast Guard is doing seasonal deployments, if NOAA establishes more of a presence, you need to be able to find places to, you know, let people spend the night.

And since Ed keeps mentioning how much business gets done in bars, you need a little bit of R&R, a little bit of shore leave when you've been on a boat for a while.

(Laughter.)

MR. STERNE: So the last thing I'm going to say, and this is an intentionally somewhat provocative way of describing things, but my first job out of law school was with the Environmental Defense Fund, so I started out in the environmental community.

And then I worked for the Alaska delegation. And I've had a few years of experience in between. But, in general, the environmental NGO community really looks at Alaska as a national park, and it looks at the Arctic, as an area that should be off‑limits.

And I don't think that that is fair, or respectful, to the communities that have lived there for thousands of years. Some of you may have heard the term "eco-imperialism" before, but that's pretty much what it is. Sitting back in the lower 48 and pointing a finger at Alaska and -- I'll borrow a phrase that my former boss, Senator Murkowski, likes to use a lot -- try to turn Alaska into a snow globe, you know, pretty to look at, but off‑limits for development.

And it doesn't have to be development for the sake of oil and gas or minerals, but you got to keep the lights on. You got to keep the schools and communities. You've got to keep reasons for young people to stay in these communities so they stick around.

So, you know, while there are really, really significant challenges to do things properly, to do things safely, and to have a viable community in the U.S. Arctic, it's definitely worth it. So, thank you very much for having me today.

(Applause.)

MEMBER PAGE: Okay, I think, Ashley and I will kind of moderate any questions here, but you can direct those directly to the panel, but we're now open for questions to the panel. And I think Admiral Gallaudet is first in line, and Ashley can kind of take the controls from there. Sir.

RDML GALLAUDET: Thank you, Ed. You know, you made a funny comment. You said that you didn't know the HSRP could consume so much beer. You'll find something interesting about NOAA leadership when we join you tomorrow.

(Laughter.)

MEMBER PAGE: Well, good.

RDML GALLAUDET: We're the competition.

MEMBER PAGE: Competition.

(Laughter.)

RDML GALLAUDET: I just want to address two comments, and, first, from you, Jay. You are absolutely right, we have great, great support from the Alaskan congressional delegation. I have met with all three very often and continue to do so, and they've been our champions. So I just wanted to put that on the record.

Secondly, for you, Mike. It's good to see you. Thank you for highlighting our partnership. And you're absolutely right, I have made it a priority ‑‑ and we have two top budget priorities: our weather and water, getting the No. 1 weather model and reducing impacts of extreme weather and water, and the blue economy priority.

And an enabling objective, a top one, is increasing, strengthening, and expanding our partnership with the Coast Guard. And that's why I met with the Commandant so early on, and that's why I went to the change of command. I think you were there. It was quite warm there. Certainly, not like now. And it was just fantastic to hear the president talk about the good work the Coast Guard does, and it sounded a lot like he was also talking about NOAA.

But a couple things, too, about that. One of the ways that I've been trying to just expand our partnership is I've been getting into your morning brief every Friday.

And so my Coast Guard liaison, Captain Kurt Zegowitz, you know -- formerly it was Commander Mark Miller -- has been doing that and I make sure I personally write every entry. So when he's briefing, it's from my mouth.

And usually I keep it a three up top: it's blue economy, weather and water, and the Coast Guard and NOAA partnership. And so if you saw me looking at my little iPad just now, it was because I was writing the input for tomorrow's brief.

(Laughter.)

RDML GALLAUDET: But, anyways, I just wanted to put that on the record, as well, that we are committed to expanding and strengthening this great partnership we have together.

MS. CHAPPELL: Okay. Other questions?

Sean.

MEMBER DUFFY: Yes, I have learned some things, being from a completely different area of Louisiana and some other coastal challenges. And, Jay, I really appreciate a lot of your comments and see we have a lot of recovery to do in our area, too, related to oil spills and hurricanes and the challenges.

And I am sure it is easier to recover, but is definitely not easy, and it takes a lot of work. And I'll tell you that I was really surprised when I heard Mr. Goodwin speaking. It dawned on me the similarities between the native peoples of Alaska and the Cajuns of Louisiana. You know, areas that are -- we have environmental refugees that are having to move from their homes, which are falling into the sea, and changing our ways of life and maybe not being able to fish as much, and the impact of the oil field work, too.

And I doubt I would have made that connection if I didn't hear you speak, so I'd like to follow that conversation up. I really enjoyed what you had to say and wanted you to know that, because of you, I made that connection that seems a world apart, but many of the challenges are very similar. Thank you.

CAPT ARMSTRONG: I had a question for, for Mike. You talked about the new icebreakers that are planned for construction and deployment. Can, can you tell me, if, if they'll be equipped with multibeam echosounders?

MR. EMERSON: I can, definitely. Yes, sir. We had a very long process of going through requirements amongst the interagency, and there were 30 different agencies consulted. And there was a strong push‑back from the science community on necessarily specifying what science requirements were involved.

And, again, it goes back to some, what I consider skittishness, regarding who's going to pay for some of these things. If you say you need it, then maybe you want to help pay for this, and it wasn't a public/private partnership, we call that one Congress. So all we were saying is, do you need these things?

And they said, well we're not really ‑‑ so we, the Coast Guard independently said, we'll have a three‑beam radar on there. We'll be able to emulate what we're doing on the Healy now in helping you get some data that, for wherever we travel, and we're going to make sure that that's on there, as well as the basics of the, you know, cranes and some other lab space and power capabilities.

So, we went through the previous requirements that that we've used in developing the Healy as a science vessel and said, this is what we're putting on. And everybody came back and gave us thumbs up.

CAPT ARMSTRONG: Yes. Thank you for that commitment on the part of the Coast Guard. And I think it'll be a terrific benefit to our effort to collect pretty accurate data in the Arctic.

MR. EMERSON: That's inside baseball, but, I tell you, you know, it's a challenge to get all the cats herded, but we were trying to get a relevant cutter that's going to be relevant in another 30 to 40 years when we start thinking about the next one.

MR. FUHS: Could I add something? A question we've had about the design of the new icebreakers, and that question is will it have any emergency response capability?

And our understanding, the last time the Polar Sea was retrofitted, that the towing gear was removed. And, you know, we look at the Russian response vessels that have been built and I showed you the picture, they have firefighting, oil spill response, towing capability, hospital capabilities. I'm just wondering if any of those would be incorporated into the design of a new icebreaker?

MR. EMERSON: Yes, sir. We're in the design phase now, and we do have multi‑mission capability built into all of our ships. So it'll have fundamental towing capability, search and rescue capability, boat lowering. It's going to have room for boarding teams, who are rescue teams, who are special PJs, or, you know, special capability teams. Those will all be in there.

But the basic towing bridle and bit are included in at least three of the designs that I've seen. So we're waiting on the public proposals now. We're expecting ‑‑ those are already coming in. And then we're expecting cost estimates in October. So we're moving ahead quickly and I'll have a specific answer for you, probably, the next time I see you.

MR. FUHS: Thank you.

MS. CHAPPELL: Joyce?

CHAIR MILLER: I'm really glad to hear about the increased U.S. Coast Guard and NOAA capabilities. But we've heard on the Panel for year, about this AIS broadcasting NOAA data, and out of personal ignorance, what are the obstacles to that?

MR. EMERSON: It is, again, inside baseball answer for you, that there's an IT piece, an information technology piece that is not sexy, it is not going to compete well because of timing.

The Coast Guard is currently buying large white things with a stripe on them that make noise and they're fun to watch, and the information technology has been sort of put on the sidelines for a while.

So, we're just catching up with Windows 10, we're just implementing replacement for our -- our MISLE is our largest operational database. We are not looking at some of the apps and some of the more agile systems that we need to take streaming data, or real‑time PORTS information that's available, and make it talk to a transmitter.

And it's a very simple app. And I was talking to the Marine Exchange about if I can put this on your existing contract and I can give you, you know, a couple of thousand and your smart kids in the basement of the science center can come up with the app and get this done.

You know, we try to proliferate that in other areas. And it's a small IT piece, but the way that we're organized, the Coast Guard has not been able to make that a priority. I've pushed it. I'm going to meet with Admiral Smith here, and Admiral Neddo, the Chief of Prevention, in the coming weeks and we're going to try to put together a timeline and the key milestones to get there.

I think it's important. It's just been, at this point in time, every dollar that the ‑‑ and the changeover to a new Commandant and new priorities -- every dollar that's out there is being prioritized to operational requirements. And the IT systems, if you saw me playing with my phone, it's not fun for me, it's because it doesn't work.

(Laughter.)

CHAIR MILLER: Thank you.

MEMBER HALL: Having worked with the Coast Guard on these issues, too, it's really sad, because a lot of the money for these systems are sweep‑up funds at the end of the year, they're not actually allocated for and apportioned. So, the Coast Guard has a real hard time, when it comes to any of their IT systems, to get funding for them. It's kind of sad.

MEMBER PAGE: Thanks.

(Laughter.)

MEMBER PAGE: If I could just add that I've talked a lot about maritime domain awareness. I was reading that the IMO defines maritime domain awareness as the effective understanding of anything associated with the maritime domain that could impact the security, safety, economy, or environment.

So I think that, many times, we think of maritime domain awareness of us, agencies, or looking at vessels, but I also think that domain awareness is giving information to vessels so they have information of that domain, the maritime domain they're operating in, so they can avoid bad things from happening.

So I think we kind of look at it twisted, kind of like Paul with the chart of the world that's flipped upside down, that the vessels also need that information. So I think that's where we're kind of going. And I think there's a lot of people that have an interest, and we're going to get there.

We're moving a lot forward, actually. The D‑17's been very helpful in that and headquarters have been very helpful in that, and I think they just finished a five‑year study report that's very -- it says we should go forward.

So I think we're getting closer and closer to that. And technology is challenging, obviously, but I think we're getting better with that. So that's encouraging.

It's also good to see the Coast Guard signing the floating Swiss army knife, with more capabilities. Because I think we've learned a couple of times, you know, that the Coast Guard is usually the first on-scene, and if they have in their vessels a little bit more capability, they can, you know, slow things, or engage at a different level. And if you look at some of the other Coast Guards around the world, they're more of a Swiss army knife. If you look at the Icelandic Coast Guard, or what have you, or Finnish Coast Guard. So I'm glad to see that's incorporated, because we're not going to have tugs floating around available up in the Arctic to deal with vessels in distress and what have you, so I'm very excited about that opportunity for the Coast Guard.

And I think the good thing that we're hearing is that, even though the activity in the Arctic hasn't really grown that tremendously, yet, you know, everyone's leaning forward and being proactive and not waiting until all the activity is happening.

They're really‑‑ so there's a lot more behind the scenes, and I think this conference shows that, that there is a lot of work being done. And I think that we're going to make sure that we close the barn door before the horse gets out, in this particular case.

MS. CHAPPELL: I think we have time for one more question.

CHAIR MILLER: I have a simple question for Willie. Since you said your area's the size of the State of Indiana and has 6,800 people, I was born in Indiana, so I was interested. How many people ‑‑ is that pretty much a steady-state population, or were there previously a lot more people in those areas?

MR. GOODWIN: The native population in the area is back to what it was 200 years ago. Because when the first ships, whaling ships, started coming around, and the other ships, they brought the diseases that our people were not accustomed to, so there was a lot of people that died because of those. And now we're back to the population we had 200 years ago.

MS. CHAPPELL: Very quick.

MR. BOLEDOVICH: This is more of a request for information. So, myself and my staff do a lot of reporting and talking points for people, and any authoritative information you can provide, or what authorities you would say are the best, for either current or projected levels of marine transportation in the Arctic.

We get a lot of numbers from a lot of different places. People up the chain says, well, which one is right? You don't have to answer the question now, but if you could help us with that, that would be really great.

Because we get a lot of conflicting information about what's going on up here, and I'd like to be able to make sure I'm accurate, because I'm a former journalist. So, that would be helpful, I'd appreciate that.

MS. CHAPPELL: All right. Well, to wrap up, I would just like to thank this panel for this great overview and overlook at the opportunities and challenges in the Arctic.

I think it was fascinating to hear everything at all these different levels where people are impacted, from the local to the highest level. So I thank you all for coming today, and actually being here for the last two days, as well.

And, Ed, thank you for doing all the introductions. That was terrific. So I think we're ending on‑time, we're back on schedule, and you're probably all in need of a break.

(Whereupon, the above-entitled matter went off the record at 10:59 a.m. and resumed at 11:17 a.m.)

CHAIR MILLER: Welcome back to the morning session of the HSRP. In followup to our panel, and it's time for our public comments session, so we're taking both questions for the panel and public comment in general, also on the webinar.

So we have two comments, two speakers. Molly McCammon would like to ask a question.

MS. McCAMMON: Actually, Madam Chair, this is a comment, kind of a followup over your last couple of days. There are two projects that the Alaska Ocean Observing System is working on in partnership with the Marine Exchange and the AIS data.

This is, as people have noted, this is an incredibly rich historical database. We're funded by the Arctic Domain Awareness Center to take vessel tracks and help use that to prioritize where charting and mapping should be. This started from a national project, actually on the East Coast, and now we're doing it in the Bering Strait region.

And then we're doing a project that's funded by the National Academy of Sciences for the North Slope that has taken the AIS tracking data, combining that with subsistence harvest areas by species and by time, and then using oil spill scenarios to do some risk assessments.

If there was an oil spill in a high risk area, where might that oil go, and which species, and in what time, might be most impacted. So this could help for planning and preparation of deploying any boom or response and really helping that kind of planning effort.

So I wanted to note those two projects that we're working on that really take advantage of the AIS database.

The second thing I wanted to note is that I think there was some mention about crowd sourcing for bathymetry. And we have worked with Ashley Chappell, and there she is right there several times. And we've written a lot of proposals to start this and to do a pilot effort.

We do have the capacity of our data center to do this kind of crowd sourcing. So if you know of some extra funding that might be available to do that, actually implement that pilot effort, we have it all ready to go.

And then lastly, I just want to note that I am on the Ecosystem Services Working Group of the NOAA Science Advisory Board. And I have been working with Ed and with Denise Reed on this effort, on how all the various advisory committees really provide some advice and some priority needs for feeding directly into NOAA's priority. So it's a good working relationship. So thanks very much for coming.

CHAIR MILLER: Nathan Wardwell, I believe, had a question.

MR. WARDWELL: Yeah, hello, Nathan Wardwell with JOA Surveys. This is not so much a question as just a comment after listening for the past couple days. And I've heard a lot of great discussions about, you know, the Arctic and PORTS and 3D Nation.

I just want to highlight the importance of longterm, continuous water level measurements and short-term water level measurements in the Arctic and in Alaska in general.

You know, if we're doing PORTS, you need longterm, continuous measurements. The coastal engineers need this for designing their PORTS and, you know, I need like a year or more of observations.

And it's challenging up here with the sea ice and access and everything. But there's methods of doing that with bottom-mounted pressure gauges and buoys.

And then these longterm stations also add value to reduce the uncertainty in our tidal datums at short-terms stations, which, these tidal datums, when you tie them into the ellipsoid, are an important value for coming to this 3D Nation concept. You're not going to be tying in your bathymetry to your topography without that tie between the National Spatial Reference System and your tidal datums.

And so I just, that was just my general comment for the, listening for the past couple days.

CHAIR MILLER: Thank you. Are there other comments from the audience here in Juneau? Or questions for our panelists? Lynne, is there anything from the webinar? Who had a comment? Oh, there is a comment from Rose in the back. Rada, sorry.

MS. KHADJINOVA: Question to Paul. So what is the main obstacle in pushing the data through AIS? Can you summarize that?

MR. FUHS: Well, as I understand it, and probably somebody else could answer better than I could, but just I guess it just, the permissions to be able to do it, the permissions. And I don't know if it also ties in with the FCC or anything else. But you know, for the Coast Guard permissions to be able to use the system to transmit the data.

And I also want to mention just, you know, for some of the things whether it was a safe shipping practices as best practices, or being able to use AIS data, or anything else, I know a lot of times we'd really like to support the work that you're doing.

But it's very byzantine and mysterious sometimes the way these channel work between the agencies. So if you can help us identify where some of these points are where the influence of the end users, the marine industry, can weigh in to say this is what we need. We need to use this.

Otherwise I think sometimes in the budgeting process people look at it, "Well, this is just some other bureaucracy trying to get something and increase their, I got somebody else over here."

And you know, if we can perform that function to help bring the industry to the table to say this is what we need and this is what we need to support it. But I think we may need some guidance from you as well from where that information needs to go.

MR. EMERSON: Well, let me add just one piece is the actual mechanical connectivity between a data string and a transmitter requires communication. It requires an IT piece, coding that will tell a device to find a piece of information and turn it into a radio signal.

We don't have that right now. We have a national database that I can create signals manually, and I can take positions of a nav aid that may be off-station due to a hurricane. And we did this 364 times during the three hurricanes last year.

We manually type these in and we hit send, and they project on the ECDIS or on a bridge management moving map display, a virtual nav aid over AIS. As long as the AIS is on, the national AIS system, there will be a buoy showing on everyone's moving map.

If that buoy has to move, I have to manually put in where that buoy should be showing now. Of course, buoys don't have to move, they mark a position. But if I was to put in title information, I could put in that there is a 1.5 foot tide and hit send, and everyone could say, well, that's the tide.

But then if I wanted that tide to change an hour later or a minute later, I would have to keep putting it in manually. That's as simple as I can make it. I don't have a capability right now in the national system to take that information and stream it, if you will. So I'm obviously not an IT guy.

But I haven't been able to make that a priority yet, and I'm hoping after this conversation, this meeting, that we'll be able to elevate that to a priority for the Commandant and therefore for the Hill, for the Congress to say we agree, and for Coast Guard and NOAA and for the industry, we need to have that.

And so that's what I've suggested to Joyce is put that in your findings, your minutes and recommendations.

CHAIR MILLER: There's a comment from the audience. Jim, or Jon?

MR. DASLER: Jon Dasler, David Evans. So we explored that with, actually back at the e-navigation conference. So there is AIS AtoN message. It's called AtoN, it's basically for weather tied to current. Broadcasts information, and the pilots are doing that and using messages and getting it out by that.

But we were always told you can, like Sutron even makes instruments where you can tie it into the gauges and it'll format it into AtoN message and you can do the broadcasting. But the issue was bandwidth, and they were so worried about --

MR. EMERSON: Is that atonus?

MR. DASLER: AtoN, like Aid to Navigation. AtoN, can't remember the exact message is like a 107.

MR. EMERSON: Oh, I thought you were talking about the system itself.

MR. DASLER: Yeah, no, but it's an AIS broadcast message that's specific for weather information. That's probably what Ed, I'm assuming he uses it for the same message ring.

But I know in Europe, that use that quite a bit. But we were told it was, they were concerned about bandwidth. So that might be something to help push to get that going.

The other thing, it wouldn't work so well in Alaska, but in the lower 48. And when we used a lot of Sirius XM Mariner, that, you know, the weather overlays where you can get cones of probability, radar overlay. And I was just talking to Rich about that.

That might be nice for the CO-OPS team to get the PORTS system on those systems where you, you know, it's a good way of receiving that information.

MEMBER PAGE: Can I clarify an issue just real quickly. I mean, this bandwidth capacity, I think this, one of the issues is that it's that as more and more vessels are getting AIS, if you're in LA-Long Beach on a Friday afternoon, and the sailboats take off their AIS Bs. And you have all the vessels at A and everything else, you do have a capacity issues as far as too much information going over.

It's like listening to VHF radio. So much noise on a VHF radio, people don't listen anymore in LA-Long Beach because it's just clutter and non-relevant. That's something the Coast Guard's working in other frequencies and other challenges.

But it's nice in Alaska, we don't have that issue, we never had that overload of information going to AIS. So we have a unique environment where it does work and it's not a capacity issue.

But you know, Mike Emerson's challenge is when he looks at solutions, he's not going to look at it nationally. And this solution doesn't work everywhere, it works in some of the areas. And that's the trick, is how these regional solutions that work in particular areas.

And so that is a legitimate concern in some areas. It's not really a concern up here, but it is one of those issues you're wrestling with, the technology and the capacity and the frequencies, and this is internationally we're realizing that we've already, this has really been used much more than we'd ever thought it'd be used. And we have to start figuring out how to deal with that. So anyway.

CHAIR MILLER: Lindsay, you had a comment.

MEMBER GEE: Yeah, just so Mike I guess is we did hear that a lot. I think that with NOAA regarding the kind of digital infrastructure and those sort of things. And we had a position paper see that it's like, we see that as one of the key issues.

And I think but part of the message is we all kind of understand it and think of it as that IT kind of stuff, we don't want to. But it's actually just as important as the other infrastructure, whether that's ships, roads, railways, all that sort of stuff.

And I think the message is, kind of it's, in this modern age, it's the infrastructure. And that's something that if you can, I don't know, we acknowledge that and we support it. We had a position paper saying that's just as key, and it's the things that are transparent to everybody, the ships are sexy to look at an all that sort of stuff.

But you can't do anything without the foundation, whether it be the digital charting information, the tidal, the NGS kind of levels. And I think the message from the HSRP has always been, yeah, this is a key element and it needs to be really public. They changed the message, it's not just IT, it's infrastructure now.

MR. EMERSON: Completely agree, sir.

CHAIR MILLER: Okay, and I would say, having over 40 years worked in and out of NOAA as in various capacities as a contractor, as an actual employee, and I'm sure it's the same way with the Coast Guard. Some of the infrastructure issues just drive you crazy.

And you know, I'm sure everybody around this table has a story, that's worked for a government agency, has of you know, how difficult it can be to solve IT problems in particular, so.

We have a comment from the webinar, Guy Noll. And Admiral Smith is going to read it.

RDML SMITH: Yeah, so Guy asks, "Has there been any discussion of Ecological Coastal Units, which is a USGS-led initiative?" And he lists a website which may be of interest to Panelists. Anybody have any comments or answers on that? Otherwise, it's an interesting thing to follow up. Thank you, Guy.

CHAIR MILLER: Any further discussion? Panelists, you're welcome to stay or go as you need to. I believe Ashley and Ed are going to lead a discussion of next steps for and our future topics for our Arctic Working Group. Ashley and Ed.

(Applause)

MEMBER PAGE: True to form, I have nothing profound to say. Just talk about parties and beer and stuff like that's my strength.

But the, you know, Arctic, we have a subset of Arctic Working Group that we decided that, Andy was part of that, I think Larry, oh there you are, of course. And Julie and others are part of that group.

And we decided we're going to hold off making decisions until we talk to people that are experts. And those experts just presented to us moments ago. So we obviously have to digest that, discuss that further, what have you.

But it'd be I think somewhat premature for us to start identifying the issues without actually listing the people that have other perspectives and a wide range of perspectives. And I think clearly every one of those presenters came from a different angle.

And I think that gave us a good breadth of the issues, the challenges. But also the niche, if you will. And of course these things always go astray into, bleed over into other issues. But the niche within the NOS program is pretty clear.

There's a lot of relevance to NOS and how our information, or the information -- it's not ours, but the information NOS provides is going to contribute to ensuring that this increased maritime activity has the least negative impacts.

It's safe, efficient, environmentally sound, and that the Native communities are, that they can continue to exist up there and not be worried about oil spills and what have you landing on the beach.

It's also, to me, we talk about LNG, more and more vessels are going to have LNG on board. And it's intriguing to me, and I think that this may be something, I'm not sure if it's within the bandwidth of HSRP or not, but I think we should raise the issue that all these safety environmental regulations are all directed toward vessels carrying oil.

And so if you don't have oil, you're just an LNG vessel only carrying 50 miles of containers, there are no regulations in place to talk about emergency response. There's no requirements for ship, I mean firefighting and salvage, no requirement for other response.

There aren't even risk mitigating measures, you know, in many cases because it's all oriented toward oil. OPA 90 has assumed, and at the time safely assumed, that every vessel out there was operating with oil. And therefore that was the concern that when a vessel hits the beach, there's going to be a oil problem.

Of course there's other, certainly the passenger vessel regulation coming into play also. But now we're hearing in some cases, I don't really see them in our waters, but there are nuclear vessels obviously operating in the Arctic, at least in the Russian Arctic.

But we are going to start seeing LNG vessels. And so I think we need to kind of think about maybe that too is something you don't want to go on beach. Even though it doesn't spill oil, I think the idea that vessel, a thousand-foot vessel of 50 miles of containers floating around would probably of concern.

And maybe there'd be some looking at that and risk mitigating measures and regulation applied those types of vessels. Because there's other hazards other than oil hitting the beach. So I think that's another area we kind of need to look at when you hear LNG, let's think about that for a second. It's not only oil.

And of course the other issues it raised, have been raised as far as how that's impacting the communities. Well, we don't want to impact their native fisheries, the subsistence hunting operations or the wildlife that appear in that area. It's a very rich biological region, and we don't want to -- and it's dynamic obviously, because ice is changing.

So you know, in the Coast Pilot, which is not that responsive, obviously. And I know Admiral Smith and I have talked a little about this as far as the idea of a dynamic interactive, more, you know, relevant Coast Pilot sends information to the vessel in that particular area, and not irrelevant information.

And one of our friends that the Admiral Smith and I have a friend that, Kip Louttit down in LA-Long Beach, who is running that vessel traffic service along with the Coast Guard. And he talked about how information, the challenge of getting information to vessels can be they can act upon it.

And if you're a major ship and pulling in LA-Long Beach, you're going to listen to pilot frequency Channel 9. Your required to get Bridge-to-Bridge Channel 13. The BTS, Channel 14. You're going to be listening to Channel 16, the hail and distress frequency. And probably 21 or 22, some of the broadcasts are going on. But try to listen to five different frequencies and navigating the vessels and listening to your crew.

Well, there's one container ship that was just plowing in too fast, and there's congestion up ahead. And the Vessel Traffic Service called them on 9, 13, 14, 16, 21, 22. Couldn't get hold of the ship. And even though he wasn't authorized to do so -- I'm not putting him on report, am I?

Anyway, somebody, unknown, sent a text message to the ship via AIS. Said, Captain, call us on Channel 14. He called right up. Yeah, Traffic, what do you need? So he was information overload.

There's too much non-relevant information going in the airwaves at him that he basically shut down and says 99% of this is non-relevant. I can't tune in and hear the only relevant stuff.

And that's part of the reason why AIS came about, was this idea of delivering information better, relevant information to the right vessel, and not giving you all the information everybody out there needs to know. And you're supposed to dissect and pick out the little item that's relevant to you.

And so that's where I think the future's going, is if the best information, accurate information, timely information to those who need it, and not, you know, not everything else out there.

And so those are things I think that we can look at as a new maritime frontier with new technological tools that we can introduce that actually some HSRP people can discuss and explore and provide in position paper. That's my preliminary thoughts.

But I leave this now to my colleagues, Andy and Larry, if they have any other. And Julie, of course. Lindsay, aren't you on my, I can't remember, did you agree to be on the Arctic Panel? Of did I just make you on, I can't remember. On the Arctic Subcommittee Group, are you on that or not?

MEMBER GEE: I'm on the Arctic Panel, yes.

MEMBER PAGE: Yeah, okay, okay. I'm sorry.

MEMBER GEE: The Australian, I'm from Down Under Arctic.

MEMBER PAGE: Either way. Whoever else has said they want to be on it, I don't recall. I don't have the list right now, so.

MEMBER GEE: I just, kind of just what you're saying there about, and I think it relates to what Andy and Larry, I'm not sure with the, we're talking about the infrastructure and the IT and that sort of stuff. But we, the use of that and the user interface, and I think that's one of the. It gets a bit diluted.

I think people that have been to UNH and seen the visualization lab, what they miss in that, they see the results of something. I think someone had wind up the other day, and that was a really intuitive way to see data that's essentially from a number of models.

And it's about how you perceive the data and make it easy for people to get it. And the visualization lab underlying that is the sort of psychologist and that testing of how people interact with data, and maybe that can be raised in the, you know, your research over there, I think, that maybe Larry comment on that.

But it's fundamental. Visualization comes about because it's an easier way to look at data and to try to lower that overload that people are getting. And it's like, okay, you need that real fundamental research in the psychology of interacting with it.

It's not some software guy that's going to solve that, because they kind of mess that up in the end. And you really need that fundamental changes that move it forward, I think, so.

DR. MAYER: I'll just comment, and I say I can't agree more. But that's somewhat self-serving in terms of what we do. But I think it's critical that we start thinking in those directions. In terms of not dismissing a visual display as the way to integrate these kinds of information in a very intuitive form.

And before Anne goes running out, I'll just say that already she's started some discussions that we're going to have with our lab with people at Volpe who are making PPUs and seeing how we can actually get. Our frustration is really getting that input from the users, from the pilots, from the navigators, and really making sure that what we're developing from a research end is a useful tool

And I think the more we can build those connections, and this venue is a great place to start that, the better off we'll all be.

MEMBER PAGE: Agree, and those are all good points. And I guess the thing that I've noticed also as we start pushing out data that, and I'll blame pilots. Since Anne's walking out, she can't defend them. She's going to defend, okay. But I've talked to pilots, like, how do you want the information displayed.

And then some goes, some will say I want a smart phone because I'm out walking about. I want to know what the status of my boat is, and so I don't need all the detail. And then someone else says, well I'm not on a computer screen with all of the charts and somewhere.

So the reality, depending on the circumstance and the individual and the personality, there's not one solution. You have to have a couple different ways to present the data. And I think then you meet these needs. Because people are wired differently, and some people read better.

But we certainly know some ways of five different frequencies broadcast doesn't seem to work, you know. And so we, there are other ways to deliver it, to text or smart phones or computers and whatever.

And so I think we do, you know, three or four different types, and some people are going to want the Coast Pilot, quite honestly. But it may not be as relevant and current, but they still like that aspect.

So the challenge is let's get information out, and we get it out in several formats, and so it's easier to interpret and apply and whatever. See, I pulled my punches since Anne came back in.

CHAIR MILLER: Anne, any comments?

MEMBER McINTYRE: I think both observations are correct. You do deal with like kind of information overload, and you have to find like a professional process to kind of cull through the information. And it's, you know, just even talking about the VHF radios.

Most of the time when I'm doing something that's complex, like docking the ship or something like that, I turn Channel 16 off. There's just certain things that I do to disassociate all that information from coming in.

And I also agree with the customization standpoint, is that pilots in ports throughout the United States have different needs, different environments that they work in. And there's different ways to present the information, and then there's also different information that they need.

CHAIR MILLER: Thanks, Anne. By the way, goodbye.

MEMBER McINTYRE: Thank you, everybody. It's been a great meeting. I really do appreciate all the effort that went into setting this up and I learned a lot, and I think it's been really valuable. Thank you.

CHAIR MILLER: Thanks. I would add to perhaps the Coast Pilot information, perhaps the Coast Pilot is more useful for people who are transitting areas who aren't familiar with them.

I mean, generally the people in an area will be familiar with that information. But the people coming up for the first time or something still need that wealth of information that's there.

MEMBER PAGE: Well, I mean, I saw the article today that Admiral Smith took the front page again, the Juneau Empire, he's a star here. But he talked about in nautical charts moving on. You know, we made it, I'm sorry. But you had lots of quotes.

Anyway, and yet there are some people who really love charts and probably still want them. In fact, we have a print-on-demand chart printer in our office, and people come in all the time wanting. And I said, you can get electronic charts too, you know that.

But I'm the same way, I like, it's sometimes I like a big chart, I can lay things out. But I'm on my little boat, a little chart just where I am is all I really need. So, and I read digital books, and I sometimes dislike a regular book, you know.

And so reality is we want a couple different ways of getting this information. And that's fine. And I think the challenge to the Coast Guard is to some extent, you know, people say, why not do virtual aids? Well, you know what, people depend on visual.

There's nothing more confident, comfortable than knowing when you see a visual aid, you have total confidence. And maybe off-station, but you have total confidence, and you know, hopefully it's on-station. More often than not it is, obviously.

But there's some, you know, when people are talking about virtual aids, it's really just another layer on top of that. It's not taking the aid out necessarily, it's just another higher confidence. And they can transmit the aid as off-station or determine it's off-station and what other things such as that.

So at the end of the day, people really will tell you that I want both. I want a virtual aid and I want the actual aid itself. Because I'm in fog, I can't see the aid, but I can see your virtual aid, or what have you.

And I know if in ice, I have less confidence in the -- or some other conditions, I have less confidence in the aid than I do, or. Because some of these aids around here get taken off by ice, and you're off someplace else.

In fact right now, when I run the bar, I've seen a couple times like I know that buoy's someone here to take it off-station. There's no one depending on it. Because I use a combination of past track lines and look at the Aids to Navigation.

So the challenges are that we introduce and add another layer of information into the network. It doesn't necessarily replace other things completely. In some cases it will, but not always will it be the case, you know. So we just need to understand that.

It's not that simple, it's just take one out, put something else in place. If you get rid of coast pilot, someone's going to be upset, you know, because they lose, there's a strategic plan. You're sitting out there, planning your voyage, it's a good tool. And you can flip through better and understand things.

But when you're actually underway, you may forget those details until someone sends you an alert. And you go, oh, yeah, let me look back at that, so.

CHAIR MILLER: Lindsay, you had another comment.

MEMBER GEE: Yeah, just another comment related to that again. I think as, it's one of the areas that we talk about, the digital infrastructure and the importance for NOAA to really go from a product, I think, to a data infrastructure.

And in a way, I think that the ocean's in a way a bit constrained in shipping by the standards. Because we're very much, you know, the NOAA and the national authorities are constrained by the SOLAS requirements in the end. I mean, that's kind of the key thing.

Whereas on land, you know, the data's available and many, many people have used it and we see it on our apps and all those sort of things, right. And we're constrained, I think, offshore because there's not as many people operating offshore. There's us, you know, there's kind of not many of us if we think about it.

And so this is where I think industry are there, but not enough. And it's just a market in the end. But my view would be we'd like to see the data out there. And that's why it's so critical for NOAA to have all of their data available. And then people that don't need to have it to the SOLAS requirements can build the apps and those sort of things.

And this is an area where the ECDIS was needed to transfer from the paper chart to an electronic chart, but in a way it was a disservice to the non-SOLAS people, because really, my view is like, oh, well, I'm a fisherman and I want to look at it this way.

Exactly what you say, I'm a tug operator, I want to look at it this way. I want to go up on the intertidal areas, I want to look at it that way. And I think that should be the vision that it provides the data service for those people that want to do stuff with it. That's where we've moved to.

And you know, the previous way we looked at the data was the chart, and I think we're moving forward. And I commend NOAA and I think what Shep's doing is moving in that direction.

But communicating that to people and trying to get industry involved to be able to -- well, you're doing it in a way. And already at the Marine Exchange, you're providing, taking stuff and providing it the way people want it. And you're saying, like with the weather, people just love that.

And I think that's a key message, that I don't think NOAA can provide all the products to all of our, the users in the marine environment. And acknowledging that and then saying, yeah, but we're going to make sure as NOAA we've got the data infrastructure, then others can build on top of.

I think that's a real key, in my view and from a technology kind of point of view and an industry point of view, I think we're, and we really need to have the industry then come along and build those things.

But I think we're always going to be constrained that it's a much smaller market that they're serving to the, you know, land, people driving cars and all that sort of stuff, so. It's just a general comment on that, thanks.

CHAIR MILLER: Okay, so we'll hear probably from the Arctic Working Group after they have a chance to get together after the meeting and have their first interim telephone conversation.

Okay, it's 11:50, we have a lunch break, a working lunch for the HSRP members. Oh, I'm sorry, I forgot one thing. Oh, okay, sorry, we're not going to have the break. First of all, Larry had an announcement.

DR. MAYER: Yeah, just an informational announcement. On September 11, Tuesday, September 11, the Ocean Studies Board, the Polar Research Board, and the Marine Board of the National Academies of Science, Engineering, and Medicine are going to be holding a, what they call a scoping session on arctic marine infrastructure.

And a scoping session for the National Academies is when there's been enough interest from a number of agencies, and I can guarantee there are a number of agencies that have expressed interest in supporting our study by the National Academies on a particular topic, and in this case it's arctic marine infrastructure.

So the one-day session is going to be held to try to outline what the scope of that study should be. And there'll be representatives from a number of different federal agencies, from a number of different stakeholder groups, state agencies, and the local community.

And I just wanted to let you all know that Captain Brennan will be the Coast Survey representative at that meeting.

And should you have any issues that you might want raised at that in terms of what a National Academy study might be looking at with respect to arctic marine infrastructure, I would suggest that you talk to Captain Brennan, and he can feed that into the session. That's it, thank you.

CHAIR MILLER: Thank you, Larry. Julie, we're going to put up, for the audience's information, the CO-OPS Group has put out a strategic plan. The HSRP was asked to respond to it, and this will be included in our letter to the NOAA Acting Administrator after the meeting.

We have previously discussed this, and this is just a confirmation of our decisions of what comments we should make. And I'll turn it over to Julie Thomas.

MEMBER THOMAS: Thanks. So as Joyce said, the HSRP all submitted comments on the plan. First of all, we want to thank Rick Edwing for allowing the HSRP to review this and to provide comments. That's really great.

And why don't, we have already looked at it this morning, and I think that we'll just, it's only like five pages here. We can probably flip through now. They go on to the next page. Give everybody a minute to read each page.

We did make the corrections mentioned at the breakfast meeting for the sake of the HSRP members. There were a few corrections, we made that. And so we can flip through this. There, okay, key performance indicators, tidal datums, questions including more graphics, particularly where it pertains to the PORTS system.

Acknowledge private sector more prominently. The IOOS Regional Associations are called out and the partnerships. There were quite a few comments highlighting, CO-OPS did a good job of highlighting the importance of partnerships going forward.

I think this group all commented on the fact that these partnerships should be front and center. And let's see. And communications as far as -- oh, maybe include a few sentences as far as the value of what that CO-OPS's products and services are. Go ahead.

And once again, partnerships in leveraging, give some details. And whether or not there wants to be just the mention of precision navigation or blue economy in there. Go ahead. We thought it needed to just be read through one more time to catch some editing and maybe synthesize a little bit better and improve the flow.

There were a few grammar issues, there were a few confusing terms that were called out. Go ahead. Maybe a comment as far as placing this document in the NOAA Strategic Plan. What is the role there as far as how does it support that?

Once again, the last one up there is talking about partnerships and NOAA priorities. Okay. Oh, there will be a followup implementation plan produced through CO-OPS, and a question came up about whether or not we will have a chance to review that as well.

And then very specific, the next couple pages drill down, this plan actually highlights some goals and sections.

And this comment really responds to the question that it sounded pretty expensive, frankly, to fulfill a lot of what was being put forth in this particular section. And we just wanted to see if that was really realistic, and maybe some more details on that.

Once again, encourage these partnerships, both at the federal and the regional area. There's models that are being done at NCEP, CO-OPS, other federal agencies, and at the regional level. And it seems like sometimes that these different efforts aren't really coordinated well.

This, Goal 2, Objective 2.1, was to give a little bit more explanation on this implemented data-driven system. I've already talked to Rich about that, he's totally on board with detailing that out.

Expanding coastal observations. This I already mentioned. You know, realistically, what can be done with coastal observations in the near future with our funding climate. Goal 2, Object 2.4, was, once again, and this I think pertained to modeling.

And maybe give some more detail there and particularly we wanted to include the word "validation" so we could make sure that that was included in any planning for models going forward. Which might be assumed, but we wanted to highlight that.

And I believe that is all. That was the last page, thank you. And so first of all, I think we, if there's any public comments on this. Sorry, I went through it rather quickly. I have a hard copy of these if anyone wants to go back.

We need -- we just have to air it in public, we don't need public comments. I know we need to go around here, okay.

And then we do need concurrence from the Panel that we can submit these comments along with our letter to the Administrator. Anyone have any objections? Okay.

MEMBER PAGE: Can I add one thing here.

MEMBER THOMAS: Of course. Done, no, go ahead.

MEMBER PAGE: It has nothing to do with beer, by the way, so. For once. I think that in my look at this document, I really wasn't sure what it was designed for, what the audience was, whether it was going to be a public presentation, whatever. But it's your mission statement on the website.

And so I hope that, you know, the CO-OP folks realize this is, at least from my perspective, this is just some other candid, frank perceptions of the data and how maybe you could present this differently.

But I would not be offended at all if they didn't take any of this stuff and didn't incorporate it, you know. It's really just, they're asking for fresh perspective, someone else. And not being right in the fore, but this outside looking in.

And that I just saw it as a fresh perspective saying, maybe it'd be clearer if a diagram or a graphic or whatever. But then maybe it's not even suited for what you're trying to do there. But I don't think there's anything wrong in that.

I didn't see anything wrong or upsetting, it was just a matter of maybe this could be told a little clearer, more clearly, or maybe it was a little too repetitive in some areas and not succinct enough and what have you.

So I hope that seen in that light, I hope that our the HSRP Panel sees that also, that this is really kind of candid, frank. Been looking at this, this is how we see it.

MEMBER THOMAS: Right, these are suggestions.

MEMBER PAGE: You may or may not use it, you know. It's just suggestions. And if you use two or three of those comments incorporated, I think I'd be thrilled and it was a worthwhile process. But there is no obligation or no expectation, in my mind anyway. I hope that's the thoughts of others.

MEMBER HALL: This is Kim Hall. I would just say that I think we have two of our newer Panel members who, this may be the first time we've done this with you two. I think we tend to have Rich and Juliana and Shep, you know, those three definitely take our comments on board. So I think we should take it very seriously.

It should be like well, if you take it, don't. I think that they really do appreciate what we do, and so if you're asking for Panel members to play and we're not necessarily telling you what to do, I think it's important that we are engaged and are providing comments when asked.

I thought this exercise was really good because I felt I was actually helping. I appreciate these meetings and getting the information that we get, but sometimes I'm not sure I'm being effective or actually have a, from our Review Panel, we are a Review Panel, not just a committee, perspective.

So I think it's really important, as much as I agree with Ed with a take it with a grain of salt where you need to, I really do think that a lot of us put some effort into this and would appreciate you taking them seriously. And I think you do, but I want to put that out there. Thanks.

MEMBER THOMAS: I think you guys do. All right, well, I think we did have concurrence then. I didn't see any objections. So I think thank you all very much. And I really do appreciate all the comments, even the late last night ones. So, glad we got them in there. And thanks, again, Rich.

CHAIR MILLER: I think we have concurrence. Okay, I would also say we could use feedback from Rich to the Panel if our comments were helpful or how they might have been more helpful.

MR. EDWING: No, these have been very helpful. It's probably the most diverse set of comments I've gotten, not surprisingly, given the diversity of, you know, disciplines and expertise around this table.

I mean, we are taking these comments and putting them together with many other comments we've gotten from other NOS Program Offices, from the Weather Service, from other people we've gone out to. So then we have to work through all those and adjudicate.

So I will say, I can't say everything in here will get in, a lot of this was very good. And I know we'll be taking a lot of these comments and incorporating them.

You know, and getting to Ed's comment about the audience, this really is, you can't satisfy all audiences, right. And this plan in particular, we kept it short and focused, because we're really going to use it as a tool to set internal priorities and then resource those and get some, a more limited set of things done.

We didn't try to describe everything we do, at least in those strategic objectives, because we can't make everything a priority. If everything's a priority, then nothing's a priority, right.

So it really is a little bit more of an internal document, but we did try to add other things that could help, you know. Because we do want to make it public and share it. And you know, and have people understand as well.

And I am hoping to be able to share the implementation plan. Right now, we're kind of focused on getting our FY19, you know, items lined up, because we're in the middle of our FY19 planning. But kind of right after that, we'll try to put up like a five-year, you know, implementation plan.

And that's what I would hope to share with the Panel and others. So anyway, I very much appreciate the comments, and we do take them seriously, again, so.

CHAIR MILLER: Okay, thank you. One thing that has been brought to my attention, and I apologize for forgetting, I'd like to acknowledge the Rear Admiral Ken Barbor, who was a previous member of the HSRP, and he was head of the University of Southern Mississippi, I'm not sure of the exact name of the facility. But he passed away within the last few months. And just want to acknowledge his service to the HSRP, and that we lost a friend.

And there was a question, Lawson Brigham, who has been a Panel member, was not able to attend this time because he had other obligations. He was our Arctic member in the past and has been, was a incredibly productive member of the Panel and a staunch advocate for the Arctic, for sure.

Was there another topic? Gary, did you have?

MEMBER THOMPSON: Just the one we talked about yesterday, to do an issue paper on the 2022 datum, more of a common person perspective of it, I guess.

CHAIR MILLER: Yes, I personally think that's a good idea.

MEMBER THOMAS: Can we do issue papers this afternoon?

CHAIR MILLER: Okay, oh, I'm sorry, wrong issue. I guess we're going to talk about the issue papers this afternoon a bit later. We do have a project that Gary is working on, and there is another Panel member.

We, every two years, we need to review the HSRP charter, particularly in light of any legislation that has either taken effect or is process. And Gary, I believe you're going to lead that effort?

MEMBER THOMPSON: Yes.

CHAIR MILLER: Okay, that was succinct.

MEMBER THOMPSON: And as of right now, I've received no comments.

CHAIR MILLER: Is there anyone else working on it with you? Okay, all right, thank you. Okay, so now we're four minutes late, but we're going to break for lunch. I'll let the audience know that after lunch, as in your agendas, we have updates from I think it's seven of our NOAA support people on various NOAA projects and updates on their projects for Alaska, and in some cases for the overall U.S.

So that will be at one o'clock that we will reconvene.

(Whereupon, the above-entitled matter went off the record at 12:05 p.m. and resumed at 1:17 p.m.)

VICE CHAIR SAADE: We're going to do rapid fire here and I'm going to keep the clock at five minutes so every knows. And being that there is no moderator sitting up there, I'll go ahead and start with Nicole. Thanks.

DR. KINSMAN: So, I was recently afforded the opportunity to listen in to the Planning and Engagement working group's Q and A with our NSRS modernization manager. I heard a lot of different questions and very similar questions to what I get all the time here in the region.

One person might wonder, you know, this new geopotential datum, how's the official height of Denali going to change? It's going to be about three feet shorter we think.

Other people may just want to know how' the new State Plane Coordinate Zone System going to affect us, and we actually have policies and procedures at NGS to help you understand those and how we work with the states on that.

Other people may just want to know

if the average recreational mariner even needs to worry about all this stuff or if you can just trust it to be taken care of and get on your way. And yes. We're actually trying to make that happen, too. We're totally trying to make that happen, working really hard at it.

So a modernized NSRS, modernized National Spatial Reference System, is really just another way of saying a more reliable, more accurate and more accessible National Spatial Reference System, one that's there when you need it to be. And this is no different than what our agency has done for more than 200 years, but it's a little bit better. For example, we heard in the public comment period about the importance of connections between tidal datums and the NSRS, and this requires closer coordination between NGS and COOPS and also continued investment on the observational backbones needed, both sides of that equation, on the land and at sea. And on the land, that means the establishment of a Foundation CORS network.

So I'm talking about NSRS modernization and how we kind of want to pass it through a nice smooth transition. But I don't want to minimize the changes that are coming, because they are really big. It's a sea change and how we define positions in our nation. But we're not going to pull the rug out from underneath you. We're doing the exact opposite, in fact.

What we're doing is we're bracing the subfloor and we're trying to do so with as minimal disturbance as possible, and a lot of work is going into making sure that there is minimal disturbance there.

So for those of you that will be directly affected, NGS has many avenues for outreach. I probably don't need to tell you about those, though. I bet lots of you have already heard about those things in our quarterly NSRS modernization newsletter, or maybe you call into our monthly webinar where we answer questions for people. We have more than 400 people on average at those monthly webinars and maybe you guys don't all call into the webinars or subscribes to the newsletter.

But in addition to that, we've also been holding Geospatial Summits and Industry Days for the public and for our private sector partners. Our next Geospatial Summit is going to be in the spring of 2019. We've released blueprint documents for public review, and we maintain a really active presence at national professional and industry conferences.

So lastly, in terms of making sure that we're keeping the word out there about the changes that are coming, NGS has a fully staffed Regional Advisor program now, because we recognize that NSRS modernization preparedness in Alaska is different than in Arkansas.

This summer we released results of a study that estimated the economic benefits of this program to be between $18.6 and $38 million annually, so you're getting a really great bang for your buck. There are 14 of us Regional Geodetic Advisors around the nation and what we are are subject matter experts that are available to answer your targeted regional-specific questions, and we really do a little bit of everything though.

So to give you a few examples of what I've done here in Alaska to promote NSRS modernization preparedness, I respond to questions in various capacities including as a technical advisor to state working groups; I meet with our NGS state coordinator, the State Chief Surveyor, Gwen Gervelis, monthly to stay abreast of state concerns and to stand up a task force to work on the state plane coordinate zone system modernization.

I work with and mentor students to advance geodetic literacy in the next generation. At the 2018 Alaska Surveying and Mapping Conference, we had a mini NSRS modernization summit. It was the most attended session at the conference. It had folks from BLM, Army Corps, Park Service, private sector, and all three of our Departments of Transportation here in Alaska talking about the NSRS modernization and how that's going to impact work flows in our state and how we can be best prepared for it.

We do GPS on Benchmarks campaigns to support transformation, tool, and VDatum development. I provide a lot of outreach to headquarters with feedback about what's needed to guide appropriate NSRS modernization decisions and the new tools that are going to support the transition. And I coordinate across NOS, including collaborations with my Nav Manager here, and then over federal agencies as well to ensure that all of our changes are occurring in lockstep with new changes that are coming in other places.

So to be frank, NSRS modernization will probably have limited impact on offshore maritime activities, but some things really will be affected quite a bit. For example, coastal maritime infrastructure will be -- will greatly benefit from ease of GPS-based access and time-dependent reference frames that provide tools to better account for land motion and sea level change in engineering design.

And how will NSRS modernization directly affect each of you on the panel here and in this room? I can't actually answer that in five minutes but hopefully, the overview I've given you of the type of outreach we're doing at NGS and the tools and resources we have to get the word out gives you a little bit of a taste of how NGS is continually striving to not only improve the NSRS but to make sure that every stakeholder is prepared for the changes that are to come in 2022.

(Applause.)

VICE CHAIR SAADE: Thanks. That was Dr. Nicole Kinsman with NGS. So next, we've Laura McLaughlin with CO-OPs speaking on current surveys in Alaska. Currents surveys in Alaska.

MS. McLAUGHLIN: Thank you. So my name is Laura Rear McLaughlin and I am the Mapping and Charting Program Manager at COOPS, and for five years, I did run the Currents program, so I'm happy to speak about it today. So for those of you that don't know, we've talked a lot about the National Water Level Observation Program, but we haven't really spoken too much this meeting about the National Current Observation Program, and that's called NCOP.

So Tides and Currents -- we are Tides and Currents. We're not just tides, so we'll talk today about the currents in Alaska. But we collect, analyze and distribute observations and predictions of currents. The program's goals are to ensure safe, efficient and environmentally sound maritime commerce and to support environmental needs such as HAZMAT response. The principal product generated by the NCOP program is information used to maintain and update the tidal current tables, and we deploy current meters annually to assist with those updates.

So COOPS spent about an entire decade updating tidal current predictions in Alaska from 2000 to 2010. We collected close to 200 stations worth of data in Cook Inlet and Southeast Alaska and all of those made it into the tidal current tables. In 2007, COOPS deployed 47 stations in Prince William Sound. In 2008, we deployed 51 more stations in Southeast Alaska and 2 in Cook Inlet, specifically to obtain a more accurate prediction for the docking of oil tankers at DeSoto Pier. In 2009, COOPS deployed 44 stations around Kodiak Island. In 2010, COOPS completed a detailed study of Glacier Bay and across sound Alaska with 10 current meters and deployed 24 stations around Unimak Pass to capture one of the most dynamic shipping channels in the world.

In 2012, we were funded by the Alaska Energy Authority to conduct a study of Cook Inlet to support a model being developed to identify key areas for tidal kinetic energy. We deployed nine more stations in Cook Inlet that year in support of that study. Looking ahead -- and actually, that study created the model that's going to be the basis for the new Cook Inlet OFS, the Operational Forecast System model, so that came out of that study.

Looking ahead, we're going to -- we're looking to partner on a circulation study of Kachemak Bay with NOAA's Kasitsna Bay Lab, and we're hoping that we can deploy those meters next fiscal year. We plan to deploy another current meter to update the predictions at North Indian Pass and we heard Captain Hans Antonsen mention that yesterday or the day before I think it was.

So just to talk about that a little bit, that station was originally based on 100 days of data at Hoonah in 1901. In 2008 -- I talked about it earlier -- we deployed stations in North Indian Pass and we wanted to move that station to be the Reference Station but unfortunately, the meter there didn't collect proper data, so we weren't able to move the station quite yet.

In 2010, we went back out and collected two -- we put two meters out and collected data again to try to update those -- the station at North Indian Pass. We did. We collected it but the shallowest that we could reach was 100 feet. We received comments that that was too deep and that it didn't satisfy what the pilots needed in order to transit that area. And just so you're aware, 30 stations are referenced to North Indian Pass so it's a pretty important station to make sure that we get right.

So in 2016, we went out and we had one of the pilots help us and deployed drifters at that station. And unfortunately, we couldn't really resolve the data because we weren't getting enough data. We were only getting it every 30 minutes. So we went back to the drawing board and COOPS redesigned how we deploy current meters. So next summer we're hoping to deploy what we're calling the elliptical buoy, and what it will do is it'll actually be sort of suspended higher up in the water column than what we've been previously able to reach. And we're hoping that we'll be able to reach that, the surface -- hopefully.

So hopefully, we'll get this North Indian Pass thing resolved with our deployment next year. So -- but we'll have to figure that out, you know, with the data that were collected. And then our last effort that we have on the calendar right now is hoping to deploy in Aleutian Passes in FY '23.

So you can see we've been quite busy in Alaska over the last almost 20 years actually, so. And I just wanted to point that in Western Alaska Region, there's about 70 entries in the tidal current tables, so it's not that many. Just heard me talk about how we've done over 200 in the Southeast Alaska area alone. But -- and most of those Western Alaska Region are the ones from our deployment that we did in Unimak Pass. So we're hoping that, you know, in the future, we'll be able to come up to Northwest portion of Alaska and deploy there, but it'll take some time to be able to do that. Thank you.

(Applause.)

VICE CHAIR SAADE: Thanks, Laura. Next is Captain Rick Brennan talking about the OCS Mapping Plan.

CAPT BRENNAN: Good afternoon. So Admiral Smith has commissioned an ocean mapping strategy to be drafted, and so we have been working on that for the past probably eight months, I think, in earnest in gathering information and data to support that. And so at this point, this is just an early brief out on our progress on that, and I think our intent is to be able to, by the next HSRP, provide a draft that you can -- that the Board can review, at least for initial comments on that before it goes for public comment.

And so I guess just to outline the document briefly, it has -- there are two main sections. The first are the focus areas that we intend to target our survey work in, and those three are basically maintaining our maritime highways, which is our core competency and our core mission as it stands today. And so that's our ports, harbors, fairways, anchorages, approaches, et cetera, both primarily the in-shore portion of that but as well as the offshore approaches.

The next area is reducing our charted uncertainty and chart uncertainties, or chart discrepancies and so I think perhaps in this community, when we say chart discrepancies, that's maybe a well-known entity, I think, outside of our community and certainly outside of the very small charting community, a chart discrepancy has -- means something different.

But I think from our standpoint, to clarify what that means, that is basically anything that has some sort of, you know, an inaccurate position on it. So if you look at our charts, you'll see a wreck PA, which is a wreck position approximate; or an obstruction ED, which is an existence doubtful. And so all of those things -- or perhaps areas where shoreline is un -- you know, does not match the chart as was discussed this week. And so trying to go through and eradicate all of those things from the chart is the second focus area.

And then in response to Seabed 2030, the third focus area is really going to be on collaborative mapping. So how can we use our expertise and resources that we have to further map our exclusive economic zone. And I will talk a little bit about the statistics for that in just a second.

The second portion of the document really gets into our execution strategy on how we intend to do that. So I think first is executing on clear priorities, and so we have been working -- and I think this panel has been briefed at one point or another -- on the Hydro Health Model, bringing that to completion. The NEEA study, as Ashley has briefed on before, is also critical to that whole effort so that, really, where we go and what we do can be traced back to a clear priority to the nation to map that area.

The second is basically expanding the coalition or the collaborations in moving towards coalition, and that is really the coalition to fully map our EEZ and why a coalition is necessary I hope will be clear once I show you the next slide.

And then finally, is leveraging the technology, and I think we've talked a lot about technology, and we'll see why we're going to have to seriously leverage it. So I could get the next slide? There you go.

So this is just to slice up the EEZ so you have a clear understanding of what we have to deal with. So on the left is a graph that shows the unmapped square nautical miles that we have within the EEZ, and you'll notice that the Atlantic and Alaska have the largest chunk of that. So 38 percent of that unmapped area sits here in Alaska and so square nautical miles is great, but as some people like to perhaps hide in the numbers, what really counts is the linear nautical miles that it's going to take to get that surveyed.

It's much easier to survey in the deeper water because you get a much wider swath. And as we saw with the survey that Joyce was showing us, she was able to get in one leg or several legs what it might take us an entire field season to get in the shallow water. So depth is critical in this. So when you look at the level of effort as equated to linear nautical miles, you see that Alaska is going to take 44 percent of the level of effort just to get that, and 46 percent lies in the Atlantic and Gulf of Mexico. I have the power to change slides now? That's a little blurry when it's that big.

So if we break it down by depth and calling deep water everything deeper than 1,000 meters, which isn't really deep and we can get into an academic discussion about where is the boundary between deep and shallow, but I have the power of the pen so I arbitrarily drew it at 1,000 meters. And so in that case, if you have 2,000 -- or sorry, 2 million -- nominally 2 million square nautical miles of unmapped area, two-thirds of that, almost exactly, is deep water within our EEZ right now. One-third is shallow water, so one-third is shallower than 1,000 meters.

When you look at the level of effort, which is the graph on the right, you can see that 99 percent of the level of effort is going to be getting that shallow water done. And by our estimates right now, I think we've got just a little over 10 ship years of work in the deep water area to get that completed.

So to be clear, when the Admiral tasked me to do this report and we were trying to figure out how we would do this to support Seabed 2030, you know, I was like, yeah, let's come up with a plan. We're going to have a plan to map the entire EEZ, you know, by 2030. Let's do that. And then when we started peeling back the layers and looking at the numbers, and we realized that that is really -- that is a very tall order. And it's almost to the point of impossible.

And so I think -- I think particularly if we start adding in the shallow water works. So the only way I think that we're going to get to that -- because to get that deep water -- or shallow water work done, we're talking about needing somewhere on the order of 400 ship years of work to do -- we're going to have to add more ships, more platforms, more sensors out there observing to get that covered in any --

VICE CHAIR SAADE: One minute.

CAPT BRENNAN: -- realistic and meaningful way so.

VICE CHAIR SAADE: And more contractors, I guess?

CAPT BRENNAN: Absolutely. More of everything so I'll leave it there. I'll --

VICE CHAIR SAADE: Thanks, Rick. Okay. Next is Captain Liz Kretovic, I'm sorry about that. OCS again with Precision Navigation.

CAPT KRETOVIC: Hi. Good afternoon. Liz Kretovic and during the Miami meeting, Captain Brennan gave you a briefing about precision navigation. And so I'm not going to go into the nuts and bolts of what precision navigation is considering that you are already familiar with it. But what I want to do is just give you an update to where we are with precision nav today.

So when we -- shortly after leaving that meeting in Miami, I was named as the program manager for precision nav and quickly had to stand up a team to be dedicated to supporting this effort across the Foundation for Offices and a member from Weather Service. So we have a dedicated requirements coordinator and a dedicated dissemination manager. We also have an announcement out on the street to hire a developer under a contract with UCAR.

This weekend, we're going to begin a resurvey operation in Long Beach as part of our commitment to the precision navigation project that we have there. We'll be using the launches off of NOAA Ship Rainier as the ship is conducting shipboard survey operations off the coast of Southern California.

We're also in the process of letting a contract for a socioeconomic study that will help us answer the nail-on questions that we get all the time, such as what are the benefits of a precision navigation program, as well as what's the return on investment for a specific port? We have upcoming projects in both the lower Mississippi River complex and currently, there is a contract that just got underway this month to begin surveying noll-to-nall which is the two meter --

CAPT BRENNAN: So proud of you.

CAPT KRETOVIC: -- thank you -- bank-to-bank full-coverage multi-beam survey from the Heads of pass all the way up to Baton Rouge. That's -- we're also in the process -- back in 2016, we conducted a pretty heavy stakeholder engagement process in the lower Mississippi, and right now we're conducting a gap analysis to identify things that may be needed in addition to ensure that we have everything in place to conduct a full-blown precision nav project in the lower Mississippi River complex.

Next week, I'm going to New York to attend the Harbor Safety Steering Committee meeting to identify requirements for New York/New Jersey so we can continue to get that project rolling. Recently, we've been contacted by four additional ports to start the conversation about precision navigation, so this thing is coming like an avalanche down upon us, and we're trying to move out as quickly as we can to make this program become something. A happy avalanche, yes, not a bad avalanche. It's a good avalanche.

I guess there's an analogy that Admiral Smith has said where Nav Services are the cake and precision navigation is like the frosting on top of that cake. I am a person who loves frosting so I'm really excited about this program. And as you can see, we have a lot going on. Thank you.

VICE CHAIR SAADE: Thanks, Liz. Okay. Next we've got -- I'm going to do my best -- Neeraj Saraf also with OCS, CSDL autonomous and unmanned vessels. Thanks.

MR. SARAF: Thank you. And so actually -- so right now I am the Acting Chief of what we call the Coast Survey Development Lab, and so I have to say my official role is IT Chief for Office of Coast Survey, so I'm actually -- given the conversation before lunch, I'm actually very happy I don't have to speak about that today.

(Laughter.)

MR. SARAF: But what I will talk to you about is autonomous vessels here. So over the past several years dating back to about 2010, the Office of Coast Survey, through CSDL, has been involved in analyzing, prototyping and testing out various autonomous technologies and strategies to see how we could make use of that. So the goal has generally been to see what that technology can do for us, specifically towards charting; can we add, you know, features to the charts, collecting more types of data more efficiently but also accessing areas that can't be reached by ships today. And so that's a key here. And also, the automation will help us do it as, again, as effectively and efficiently as possible to support our operation, so we're excited about that.

So through the years, there was extensive on the underwater vehicles and an example of that was REMUS 600. Kind of at the end of that evaluation, it was pretty clear that, again, for the goals that I stated, it probably could be best used -- best done by ASVs, so surface vehicles, and so that's kind of been the focus now. So some things we've worked with in the past and they're still being used in some forms are Z-Boats, echo boats, and as Dr. Mayer mentioned yesterday, the ASV Global C-Worker IV I believe they are using. So we've also used the Version V as well. So we're engaging with those things but also with some other technology providers such as Saildrone and iXblue which I'll expand on a bit.

So there are several projects that we've been working on and continue to work on towards these goals. One, again, is the work that UNH has done this summer, in fact, here in Alaska with the C-Worker IV, so our staff along with folks from UNH deployed that and hoping to explore more operational methods, develop more shipboard experience with that as that deployment went very well. So we're looking forward to more like that.

With NOAA PMEL, so Pacific Marine Lab in Seattle, based in Seattle, we actually latched on to a Saildrone mission they had this some in the Chukchi Sea, and so that's actually underway right now. It's gone very well. We threw in some data points just to see what comes out of that in terms of Coast Survey goals and objectives. And so -- across NOAA, though, there's fisheries and others who have interest in that mission, so we're very excited again to see how that ends up here after this summer.

So a couple of other things we're doing is -- so USM, so University of Southern Mississippi, there's been a cooperative agreement, this is the third or fourth year now, for Fiscal Year '19, so the government Fiscal Year where we're looking at, again, Saildrone as a test bed for USM to see where that can go. For them, that's actually pretty important because they try to acquire a C-Worker through their procurement process sand had issues. So I think this actually will help kick-start things a little better for that effort.

And two more things; our launch conversation, so our team is also heavily involved in -- so outfitting NOAA ships with these vessels. So there's one project currently active and another one planned for Fiscal Year '19.

And then another exciting thing that we're starting to look at here is an aerial drone and how we can integrate that, so with the -- actually, the work that NGS has done through the years with that with a slightly different kind of angle to it. I think our goal eventually is to test these out and have these outfitted on on NOAA ships to aid in data collection. So we're actually very excited about that, but thanks, NGS, for paving the way for us on that.

So Saildrone has kind have been a very interesting model for this. So really, how they're talking about it, and I did visit them a few weeks ago in their production facility in Alameda, California, so where they -- they've done a lot of great stuff from the ground up in building this data as a service model. So we've heard of -- in terms of cloud, we hear of, you know, infrastructure is a service, so they've kind of coined their own unofficial term as data as a service.

So the really interesting thing here is so an agency like NOAA doesn't have to acquire and manage and, you know, be accountable for the property, and so the actual vessel is built by Saildrone, it's maintained by them, they're the experts on it; it's outfitted with instruments and based on the data you need. So you provide them your requirements. You get the data. You don't know how they're doing it. You kind of have an idea how they're doing it but you don't really have to manage it, which a great thing in terms of infrastructure and kind of that tie to IT, too. I love that, of not having to worry about the actual vessel. So that's really exciting and so it's just getting bigger from there.

There's a much larger vessel that Dr. Mayer mentioned yesterday as well, that we're really excited to see those possibilities as well.

So some key takeaways regarding this area; it's, again, a very exciting area. As my team likes to say, you know, robot boats, right; everybody loves robots and it's cool, it's cool stuff. So -- but we're still a long way from replacing the people. So they're still the element of you still need a crew, you still need expertise to manage these and make sure they work as effectively as they can. They don't have the intelligence yet to go off on their own and do it, although we're getting closer, so every day we're getting closer on that.

However, there are, you know, the risk or the concerns of folks not being able to do the things they love isn't really there. You know, there's lots of opportunity to work with those devices to make things more effective and efficient.

VICE CHAIR SAADE: One -- one minute.

MR. SARAF: Thank you. So again, the future is really bright. And so another thing I was going to touch on is environmental compliance. So, again, we heard a little bit today as well about, you know, the impact on marine life and lively -- you know, food supplies for folks, such as in the Arctic. So environmental compliance is a big piece of this. And so we, for everything we do with it, we have to comply with federal requirements on environmental compliance, and so we do a full review of those as we do these efforts. So again, we're certainly looking forward to continuing this effort and, you know, it's a growing area that's going to really be beneficial to the industry going forward. Thank you.

(Applause.)

VICE CHAIR SAADE: Thanks, Neeraj. Next will be Mr. Colby Harmon, OCS MCD rescheming ENC coverage in Alaska.

MR. HARMON: Okay. So as you know, NOAA has two principal nautical chart products, a suite of over 1,000 paper nautical charts also distributed as digital raster nautical charts, and a suite of 1,236 vector electronic navigational charts, or ENCs.

As of last month, all passenger ships over 500 gross tons and most tankers and cargo ships over 3,000 gross tons on international voyages are required to use ENCs within ECDIS. Also, last year the U.S. Coast Guard authorized the use of ENCs for commercial vessels on domestic voyages without the additional carriage requirement for paper charts. Thus, NOAA now considers ENCs its primary nautical chart product. This is often described as an ENC first strategy. New sources compiled for application to ENCs first and new chart coverage is now always produced as ENCs, sometimes exclusively as ENCs without any corresponding raster chart coverage to follow.

Another aspect of making ENC first is a plan to rescheme and improve the quality of the entire ENC product. The current suite comprises over 1,200 irregularly-shaped ENC cells compiled in over 130 different scales. This is a legacy of the paper charts from which ENCs were originally derived starting in the 1990s. That's what's displayed in front of us here.

The new ENC scheme has a standardized regular gridded layout in which larger scales fit neatly into the footprints of the next smaller scale cells. The number of compilation scales has also been reduced to 12, two for each of the 6 standard ENC usage bands. The first ENC coverage to be converted to the new scheme will be smaller scale cells which are the same or nearly the same as the one -- as one of the dozen new standard ENC scales in the scheme. Other ENCs which will require recompilation and new usually larger scales will follow.

In Alaska, work on smaller general-scale ENCs in the Chukchi Sea has already begun. Larger harbor and approach scale ENCs in Etolin Strait, the Shumagin Islands, and Southeast Alaska will come next.

The reschemed suite will ultimately have 9,000 ENC cells when fully implemented. I believe there was something in the paper about maybe taken 10 years this morning. In keeping with ENC first strategy, the need for improved chart coverage in Alaska will be met by creating new larger scale ENC coverage. The plans for new paper nautical charts first proposed in the U.S. Arctic Charting Plan in 2011 have been superseded by the NOAA's effort to rescheme the entire ENC suite; that is, the improved chart coverage described in the Arctic Charting Plan will be manifested through the creation of new ENC cells, not new paper nautical charts.

The conversion to new ENC scheme is providing opportunities to make several improvements to the ENCs such as delivering larger scale coverage in many areas, soundings and depth contours will also be recompiled in whole integer metric units, and inconsistencies among adjacent ENCs, such as sudden changes in depth contouring intervals will be resolved.

The new scheme will also support customized chart products such as the new web-based NOAA custom chart application which can generate a user-defined raster product directly from the NOAA ENC database for a customer to print. NOAA is eager to dig into the rescheming effort which is only just starting. Although the project is expected to take several years to complete, we are confident that users will start to see benefits of the new ENC scheme soon. Thank you.

(Applause.)

VICE CHAIR SAADE: Thanks, Colby. And next will be Ashley Chappell with OCS, 3D National Elevation Requirements and Benefits Study, and then we'll do questions for everyone for after that. Thanks, Ashley.

MS. CHAPPELL: Okay. Thanks, Ed. The 3D National Elevation Requirements and Benefits Study, I think I briefed you guys on this just as we were getting started at the Portsmouth meeting; is that right, Dave? Didn't we go brief on this issue then?

(No response.)

MS. CHAPPELL: So since then, I've communicated with you through emails from Lynne about where the study stands. This is the Requirements and Benefits Study looking at how elevation data, land and sea, if you will, the requirements for that and where people need it and why they need and hopefully, information on how valuable it is to them.

This is a project shared with USGS. NOAA and USGS are partnering on this survey and analysis with the support of Dewberry as the contractor on it. And you also see the logo for the Interagency Working Group on Ocean and Coastal Mapping, which is my interagency team and the 3D Elevation program. So we have all of these agencies that are interested in this information.

It follows on the -- just a quick reminder because Rick mentioned the NEEA study. In case that didn't trigger any memories, the National Enhanced Elevation Assessment was the study that USGS did for terrestrial lidar, topo lidar back in the 2010-2012 era. And this is the follow-on that incorporates ocean and coastal into that elevation data.

The goal of the study is to understand how 3D elevation data is needed, as I said, and how they dovetail specifically in the coastal zone, so basically just said that, how they dovetail in the coastal zone. We're looking at inland, near shore, and offshore bathymetric data requirements as well as terrestrial, you know, topographic requirements. And we're taking a sensor agnostic approach just as a reminder. No, we're not asking people to think about the technology that can give them the data they need. We just want to hear what type of data they need, what accuracy, that kind of thing. So we're not getting into more than that.

The study was -- the survey was approved by OMB in the spring. It took a lot longer than we thought but I think it was an enhanced product after that OMB assessment. I'm willing to say that in public. We released the questionnaire. You all are probably well-aware of that. You may have run across it in several avenues.

That data collection phase has been happening. We had an initial six-week release. Actually, we've learned something releasing a survey in the spring into summer is not a good time to release a survey, so we've given some extensions because of not just vacations, as you might think, but this is -- summer is the field season; you know, people are out.

So we've gotten a lot of responses so far. I think we're up to almost 900 survey responses. We're going through the ones we have to make sure that we're getting responses from all the different sectors and interest areas that we need. We've sent it to federal agencies' states who've told us to whom in the state to send it, private sector, not-for-profit, academia, so we really, you know, have a broad reach.

We're in this pink phase of data validation now as we're kind of wrapping up the survey phase. We're looking at what data we have, what kinds of questions we want to ask the people who have responded. We'll be setting up sort of validation meetings and workshops to make sure that we understand what the respondents are trying to tell us about their data needs. So that validation phase will happen.

We move then into sort of aggregating all of those benefits together and the final report phase. And then the part I'm really counting on is the program scenario phase, which is where the -- with the analysis, we determine kind of what is the -- what are the different possible scenarios for collecting and providing elevation data to users. And, you know, it might not be that everybody -- that we can afford to do the best everywhere or we go to the bottom rung and provide that.

You know, hopefully, there are some different scenarios about where the -- you know, the sort of sweet spot for cost and benefit is with that return on investment question. So that will happen at the end. We're looking at end of 2019, 2020 for that, but I'm sure I'll be updating you on the progress well before then.

And I think that's all I have. These slides were in your packet. This is, you know, what the workshop interview -- oh, we don't need to get into this.

Just a quick sample of kind of how we're dealing with confirming responses from the different entities that we've sent the survey to. So not to say green is good, pink is bad so much. It's just informational of who responded and who has as yet hasn't. A pink response isn't necessarily a negative. It may be that they have interacted with us to say their interests are covered by another entity and that kind of thing. So don't think of them as slackers by any means. And this is all in your packet just as background so there you are, the latest and greatest on the 3D Nation study.

(Applause.)

VICE CHAIR SAADE: Okay. We're going to keep going here. So any questions for the panel here from anyone? You.

MEMBER THOMAS: Laura, on those currents that you're putting out, does HF radar help you at all, this just having the surface currents? Or do you really need profile currents? Or is it too far offshore?

It's too far off shore?

MS. McLAUGHLIN: I don't think that there is a spot for HF radar in that region. I think there are too many mountains probably, and I think that it's too far offshore where the location is.

MEMBER THOMAS: Right. I know that Molly had to leave this afternoon, but I think she's getting some money for HF radar through AOOS this year. And so I was just wondering if they would be helpful to coordinate locations.

MS. McLAUGHLIN: Yes. I'll touch base with her to see where they're putting them in --

MEMBER THOMAS: Yes.

MS. McLAUGHLIN: -- but we'll check with Molly.

MEMBER THOMAS: Okay. Thanks.

MEMBER KELLY: Ed Kelly. Liz, precision navigation is turning into the flavor of the month. You mentioned New York. You've got LA you're following up on and four other ports. Is there going to be some type of way to evaluate which projects get done first, because I can imagine every port's going to want to start getting involved -- or rather which one will be second, assuming New York will be first.

MEMBER DUFFY: Excuse me.

(Laughter.)

CAPT KRETOVIC: My money's on -- I want to see you two arm wrestle. No, I'm just kidding. I think part of it -- it's really hard to answer your question. I think both of you, Lower Mississippi and New York-New Jersey are both in the queue and you are the first that we're working with. The socioeconomic study is going to help us determine where to go after that.

MEMBER THOMAS: -- coordinate locations.

MS. McLAUGHLIN: But we do have four people that have shown interest in something like this, and so I think as we progress, we'll try to get you finished first. You know, I don't know how to say like we'll have it all like done by a specific date or time. And Rick can add in a little bit, too.

CAPT BRENNAN: So to be clear, I mean the data acquisition in New York is complete. That data is working its way towards application to the chart so, you know, I think as far as products for that, we'll see products for, you know, New York come out first.

The data acquisition on the Mississippi is currently underway and just started within weeks of this meeting, so that will be over the next year or so as those surveys get completed and processed and applied and we're able to start deriving products there.

Beyond that, I think the thing that we're looking for and where we have gone is where there are willing partners and willing ports that are interested in partnering with us. So I think that's where, you know, we're overlaying that on top of the shipping demands that requires that. And so I think that's how we're looking at it among other things as a means of determining where to go next so.

MEMBER DUFFY: Of course, we would love to help with some of the collections along the lower river and, you know, a good field trip to New Orleans has a way of really helping things along, and you know we're committed.

Ed, you may be number one but being number two is not that bad either.

VICE CHAIR SAADE: So I have a question for Carol or Laura. Carol, go back 20 years and if you had a really comprehensive current measuring system in the Cook Inlet to aid in what we had to do back then, would it -- could you apply it to benefitting the way the survey was run?

MEMBER LOCKHART: So one of the hardest challenges of working there was at the time, getting the dynamic draft for the vessel correct, because the speed over ground didn't match the speed through the water. And so the way we got around that was by using engine RPMs and translating that into speed through water. If you had current information, yes, maybe you could have done that a different way and modeled that differently so it wasn't quite as hard to get to and it may have been more accurate. So that's the first thing that comes to mind with that.

The other thing it could have influenced was the year before when we're trying to figure out what the tidal zones should look like, because they changed a lot, the shape of them changed a lot, especially going around the bend there and current information may have helped with that, too.

VICE CHAIR SAADE: Okay. Thanks. So Laura, we did a survey off Nikiski for a couple of years with Exxon, and we had a current -- I think we still have a current meter there. I'm not sure but if there was industry current meters scattered around, would that be of interest?

MS. McLAUGHLIN: That's probably a question for Rich actually, but the -- you know, we have been talking about partnering with outside partners for collecting water level data, so one of the things that we should be starting to look into is how can we partner with outside partners to collect current meter data as well. And, you know, perhaps that's something we need to start thinking about as time moves on, but I'll let Rich answer that.

MR. EDWING: So I'll turn my mic on so I can talk to you next to you, but the short answer is yes, we're interested, and certainly either in getting some of this, just a few months of data that we can just make some predictions from or potentially, you know, almost create a PORTS system out of it if people in the area are interested in that. But we also have to look at, you know, what type of equipment's being used and standards and, you know, it's -- as you know, it's not as easy as flipping a switch and that data getting over to us. We have to look at those technical issues as well. But the short answer is yes, we'd certainly like to explore that.

MEMBER GEE: Just a couple of questions for you but actually one related to that -- this is my ignorance, I guess -- is with the Coast Survey ships that are out doing the charting in remote areas, do they -- are they collecting current information as well or not? Is that not part of the normal mission, and would that be useful?

MS. McLAUGHLIN: The NOAA ships you're talking about?

MEMBER GEE: Yes.

MS. McLAUGHLIN: No. They don't collect current meter data. So we do partner with them occasionally if they're transiting through an area that we're interested in. Like for example, the one next year that we're going to deploy in North Indian Pass, actually, the Rainier, we're hoping will deploy that for us in April and then come pick it back up in September. So we do take advantage of them being in the area but it's not a -- it's not common for them to deploy instrumentation for us.

MEMBER GEE: Okay. Just --

CHAIR MILLER: And what about the ADCP data, isn't that on most of the NOAA ships; wouldn't that be helpful?

MS. McLAUGHLIN: Most of that data is in transit, right, so what we're looking for is a single point, like a single position so that we have 30 days of data in that one location, so that we can do the harmonic analysis on that and get predictions from it, so the -- like a transit wouldn't give you that information.

CHAIR MILLER: Okay. I just thought it might be useful additional data to the data stream.

MS. McLAUGHLIN: I think it could be useful for modeling purposes but probably not for actually doing the tidal current predictions.

MEMBER GEE: Okay. Yes -- no, that was sort of similar. I was just thinking if there -- you know, it's -- the deployment of assets there is, particularly in Alaska, I guess, is you have few assets up there. If there was the opportunity to -- question of interest really whether that happened. Then in a way, related to what Roger is saying about the autonomous systems as well. I guess it's -- mostly we talked about it with -- sort of up at UNH about mapping systems. But I wonder whether the autonomous systems specifically for the tasks that NOS are looking at, those other ancillary observations, you know, the -- whether it be sound velocities or currents and also then potentially, you know, using the GPS, you know, with post-processing to transfer datums and all that sort of stuff. Is that kind of part of the autonomous -- where you see the autonomous systems might be used?

MR. SARAF: I think it's very, very possible it could be used that way. I think the benefit of those devices is it could be outfitted with many things. And so that's part of the testing, and that's why we're sort of taking a very concentrated look at the lab in terms of integrating these types of things. So I think it's a possible future to be seen, but I think it's very possible to do that.

VICE CHAIR SAADE: Any other questions from anyone?

(No response.)

VICE CHAIR SAADE: Okay. I'd say thanks a lot. This is another good panel and really appreciate your time.

(Applause.)

VICE CHAIR SAADE: Okay. For the Panel, we're work through all the things that we towards the end of the day. We're going to put up the priority matrix panel first, and then we'll chip away at some of these other to do lists. If you need to take a break or want some time, just do your own thing.

MEMBER MAUNE: Okay, Ed, is the ball in my court? Okay. At the last meeting we had in Miami, we came up with the idea of a priorities matrix in which different people identified topics that they thought we might be interested in looking into for potential issue papers. And we sent out a priority matrix and had people, all members, vote on which they thought should be highest priorities. You could -- each person could vote on three to five of the various topics that we had. We received responses from 12 out of the 16 members and of those 12 that voted, 8 of them voted autonomous vessels and emerging technologies as the one that got the most interest in having potential issue papers in the future.

And for that particular one, when we had a -- we've had a couple of monthly or bimonthly telecons to discuss these issues, the last time we talked, Ed, you thought that you were gathering data now and weren't ready to prepare an issue paper yet on that. Has anything changed?

VICE CHAIR SAADE: I think what's changed is that it's doing its own thing with whether we say anything or do anything, as Larry demonstrated earlier yesterday.

MEMBER MAUNE: Okay.

VICE CHAIR SAADE: There's a lot going on. When I sat in with SAB, there was a presentation from all of NOAA's different activity relative to both airborne and vessel autonomous vehicles, surface, subsurface and airborne. So what I'm wondering is if there's really a position for us, because things are happening so fast and moving so quickly forward.

MEMBER MAUNE: Yes. Well, we don't have to have an issue paper on it.

MEMBER HALL: I just want a quick point of clarification of what actually happened in Miami. I thought the priority -- I know that it became something a little bit different between Miami and now, but the original purpose of the priority matrix was to identify also the things that we wanted to do with these topics. So when I voted for autonomous vessels, say, it was to get more information and keep it at the top of our interest list --

MEMBER MAUNE: Okay.

MEMBER HALL: -- not necessarily to write a paper. And I didn't see any of these at this point trying to be a paper yet. So I think that's one thing we are now missing is direction on what the group thought we were going to be doing on these particular topics. It was not related specifically to issue or position papers. So I just want to --

MEMBER MAUNE: That is correct.

MEMBER HALL: -- clarify where we're going with that.

MEMBER MAUNE: Kim is right. We are continuing to pursue emerging technologies every time we can. It's something we continuously need to be updated on and appreciated the briefings we had this week on that subject.

VICE CHAIR SAADE: So I guess we're all in agreement that number one is -- the one on the top of the list is happening, right?

MEMBER MAUNE: Yes.

VICE CHAIR SAADE: Okay.

MEMBER MAUNE: It's a hot topic for us. It's the hottest topic for us. We can continue to appreciate the different periodic sessions you have introducing us to these technologies and the briefings we've had this week on that. So we don't have to have issue papers on it. I shouldn't have put potential issue papers up there. It was for hot topics for us to continue to be kept abreast of. The second --

MEMBER PAGE: Dave, can I say something for a second. I mean I'm just -- now I'm confused. Of course, I'm new to the group here. All I know is how to do is throw parties, I know how to do this stuff but -- I guess my thought is our goal is to provide some advice or counsel or some input to National Ocean Service. So to me, we probably should look -- maybe there's a different list. You know, where are things that we think we should be investigating so we can provide input to NOS versus we -- if we're saying this is happening, autonomous vessels, then that's not really important. I mean I can learn about it more. I can pay attention to it but if I'm not going to contribute -- and my job is to kind of move the needles one way or the other -- just to watch what's going on but maybe evaluate something and then provide some input that can help NOAA find another avenue or another thing to pursue or what have.

So maybe there's two different -- because I was kind of thinking issue papers too, but everyone's it's not issue papers, it's just a matter of being issues you're interested or I don't -- what's the priority for?

VICE CHAIR SAADE: Okay. I'll go first.

MEMBER PAGE: I'm lost.

VICE CHAIR SAADE: And then Kim. Not everybody on the panel is about autonomous vehicles --

MEMBER PAGE: Okay.

VICE CHAIR SAADE: -- at least when we started.

MEMBER PAGE: Okay.

VICE CHAIR SAADE: So the intent of this is, from a technical point of view, was to introduce technologies to everybody so that maybe it's just out of human interest or Panel interest, or maybe it turns into something that we really feel strongly for and then it becomes something for moving the needle.

MEMBER PAGE: Okay.

VICE CHAIR SAADE: So for instance, a couple of meetings ago, Carol did a real comprehensive presentation about the way hydrographic lidar works, which was really beneficial to the entire panel. And that type of thing is what led to what we're doing here.

MEMBER PAGE: That's good then.

VICE CHAIR SAADE: And as -- you know, I don't know what we may have learned in the last couple of days. There may be some other things we want to put up there now that --

MEMBER PAGE: Right.

VICE CHAIR SAADE: -- but you're right, at the end of the day, a lot of this is -- part of it's educational, part of it's for us to latch onto something and run with it.

MEMBER HALL: Just because I'm the brainchild from this, just -- what it was for was we would get on topics, we would get to a place and we would just kind of talk about what was going on there. And we kind of loose track of some national priorities or other things other than what NOAA had asked us to do.

So part of this was specifically what Ed just said, getting smart on the issues and deciding is there a there there, is there something we need to write about or not, also to help kind of establish some meeting priorities as well. What do we want to hear about now. We're really interested in for a while there big data, so we instead of having a meeting, we had telecons with the Technology Working Group thinking about that. And it's a good way to gauge the group's changing priorities so that we can be more agile and nimble for NOAA as we answer things.

So I think sometimes we need to be producing. The problem we got to is we were producing quite a few issue papers and if you hadn't figured out through the rewrite of the precision navigation paper, that's like herding cats. And at that point, I was the one who was rewriting them so I wanted to find a new way to do that.

So I think it's all of the above and I think we do need to get back to the point on this where people kind of indicate we want more information, we want to keep tracking on it, or we want to think about an issue paper. I think we need those inputs so that you all, as leadership, Joyce, Ed, going to be Julie, can understand the -- just us regular panelists' thoughts on it. And it's also a way for folks that maybe don't always speak up during these meetings to have a little bit of a vote trying to spread the wealth of input in a different way.

So there's a lot of reasons why it happened and I think we did lose something in this one without having that kind of follow-on, what do we want to do with it.

MEMBER LOCKHART: So I guess to add to all of that, I think it is important to know what we want to keep tabs on, too. So it's easy to say, well, yes, this is happening and as a Panel, we all got educated on this a couple of sessions ago, but I think something became apparent this week because, you know, we just heard that they're going to start looking at the aerial drone now and putting that on NOAA ships. And I think that problem -- that could solve a problem that was highlighted just yesterday by the Vitus guy, that he can use this new technology to solve his problem really quickly.

There is a missing piece to that and right now, he needs the processing to be push of a button. Well, that could be some kind of thing that we say, okay, well, maybe we have UNH look at structure from ocean and processing and see if we can make that pushbutton so we can have, you know, a missed or a black box system for aerial drones that can't solve this problem really easily.

So I think, you know, when we did our panel, we focused very much on vessels floating on the water, but there are other types of vessels out there that are still in the purview of NOAA. And so I think that's why it's important to keep this kind of stuff on the list. Yes, we did it but I think we are all still interested in it, and it is changing so quickly that I think it's important to keep abreast of that. So yes, maybe it won't come up every session but I think it's important that these topics do still get discussed.

VICE CHAIR SAADE: Yes. And I would add for somebody like me, you can never end. I mean all this stuff is great. I love all of it so we have to be a little bit discriminating with some logic in there.

CHAIR MILLER: Yes. I just wanted -- one thing that Ed Page said and I just wanted to clarify one thing. We're providing advice both to NOS and to the Administrator. And sometimes, you know, I can think of the ship issue that we've written papers on and we've put a recommendation in. That's really an OMAO issue. It's not an NOS issue. So we need to remember to look a little more broadly than just NOS, just as a --

MEMBER THOMAS: I'm wondering if we -- this first topic there, what I would really like to have at our next meeting in March is some report out on has there been any progress on using any of these autonomous vessel in the shallow water bathymetry or mapping or something like that. I mean I think the reason why this became so important, particularly at this meeting, was because we really saw direct applications where that could really help some of these remote areas that didn't have a baseline for shoreline, et cetera. And if we're going to provide continuity within meetings and really tie back our discussions, we might just make a note that that might be a topic for a future meeting, too, to really tie it in.

CHAIR MILLER: I would also add that at the last meeting, we've been very privileged to have Admiral Gallaudet at two meetings in a row. That's never happened before.

He asked that the HSRP look at this topic in particular. So when I get a request like that I put it on top of my priority list.

VICE CHAIR SAADE: And just so everyone knows, we had a whole session on the status of AUVs when we were in New Hampshire so we spent an entire morning on it.

And, again, I could do that every single meeting personally, but in the interest of moving it along, and maybe the right thing to do is to revisit it once a year or maybe once every year and a half.

But with Larry doing what he did, that is one step in the update, and sometimes the Admiral does the same type of thing. We could make it more regular.

I have no problem with that just because it is a particular type of technology that is changing incredibly fast and the applications are changing incredibly fast.

MEMBER DUFFY: So I wanted to comment on something that's not here and one of the items in Miami was the discussion of working on the partnership with NOAA and the Corps of Engineers. And I will just say as someone who lives on the Mississippi River, I depend on all of our government agencies.

This past Friday I was on the Motor Vessel Mississippi with the Mississippi River Commissioner Admiral Shep Smith, and Captain Kretovic reminded me that I had my NOAA hat on today.

But I strongly believe that that is very important especially with looking at New Orleans in a year, and as the diversity of the panel offers, some things are going to be more important to different people, but I have to ask that that at least be included in future consideration.

I will also volunteer that in my area from New Orleans District to Vicksburg to Headquarters, I have a very good and close relationship with the Corps as I do with NOAA and the other agencies.

And I think there is a tendency to have silos in ways but especially with the technology increases and more information being available, I would say that that was a very important one to me, and if I could make an appeal that that also be at least kept on the back burner, I'll keep stirring that gumbo, if you will.

But I would like to see that not fall by the wayside.

MEMBER MAUNE: Do you feel that was not included in the public private partnership there, one that it's --

DR. MAYER: I think that's a very different -- and I want to reiterate that. And I think maybe not so much at this point in time for an issue paper. I think it can evolve into an issue paper, but when Lynne asked for suggestions for the meeting in the Washington area, this might be a really appropriate thing to focus on.

Because I absolutely agree with Sean that this is a critical issue, and I think there's been some good progress, but I think we need to keep stirring the gumbo and keep the pressure on.

And so if we made that a focus area for that meeting, that might lead to some kind of issue paper that we might want to produce. Exactly, well, I'll leave it to the people who know who the right people are, but I think that's the place it'll be.

VICE CHAIR SAADE: I'm inclined to suggest just as we have this panel here. Obviously these topics are still of interest, and we had a lot of discussion about exactly what you're talking about at one of the previous meetings that I was at.

It may be that we need to have every single meeting a five or ten-minute refresher because -- just to make sure that people realize we're not forgetting about it and things are changing rapidly.

MEMBER HALL: There's a lot more on this list, these are just the top votes, and the full matrix has more information on specifically what we're talking about.

Because these are really generic, large topics, and so there is more information. What I had done in Miami was everything I've heard related to them I shoved into that spreadsheet.

And this is just I think for Dave and Julie's purposes to just get us all on one screen. But there's more to it, and I'm happy to share that with everybody else.

There are some specific things people wanted to hear about, and, again, I'm just going to go back to the reason we started this was part of it was to help NOAA think through what we want to see at our meetings as well.

It's not just issue papers, and what we want to hear about, and I think we got some of that from this last panel which we don't normally get.

And so to say these are the things we're interested in, even if it's not something that we have anything that we can do about it right now, that doesn't mean when we get to D.C. next time there won't be something hot front and center that we need to do.

And, again, yes, going back to the Army Corps, that is always one that we have. I think given everything that Shep has done with it, though, we've let it linger a little bit because we know that he's working hard on that relationship.

MEMBER MAUNE: Yes, the full matrix looks more like this. I tried to abbreviate it as best I could.

The second topic on the list was the perpetual need for all the line offices to come up with ways to let Congress and other people know the value of their services, and is there any way that we can quantify the benefits of the different offices?

The 3D Nation study that Ashley was talking about is one of those steps that will address some of those quantification of benefits, but there are other places maybe that Rich has.

I'm not sure how Rich quantifies the benefits, but the more we can come up with methodologies for doing that, the easier it is to get Congressional support for the budgets we need to do our jobs.

And so that was sort of my idea, at least of the focus behind that particular topic and why it got the second most votes. I don't know if anybody else had anything they wanted to add on this particular subject?

MR. EDWING: Well, I'll just note that we've done a series of economic benefit studies on the PORTS system. We started off with four individual ones.

First, we created a template for you all with how you gather the data and generate the benefits, and so we did four of those. Tampa Bay was the first one, Houston-Galveston was next.

New York/New Jersey was third I think, and Columbia River was the last one. And then we did a larger study which said, hey, if we had all of the major seaports in the U.S. covered by a PORTS system, what would be the economic benefits of that?

And that was completed a few years ago. And then there's been some follow-up work done on that looking at how do we target areas that don't have PORTS? How do we strategically target areas that don't have a PORTS system?

We could both benefit from them, primarily from the standpoint of accident reduction because the reports have documented a 50 percent or more reduction in accidents when the PORTS goes in, as well as further exploring some of the economic benefits.

So we've really done a lot of work for that particular system. We -- I would like to be doing some work with the water-level network. The problem there is what application area do you want to choose?

Do you want to look at sea-level rise, long-term coastal planning, or storm surge and tsunami warning, or habitat restoration? There's a wide variety of applications there, so that's probably where I need to go next.

MEMBER MAUNE: Okay, the third topic on the list had to do with relative sea level rise.

MEMBER ATKINSON: Wait.

MEMBER MAUNE: Did I miss something?

MEMBER ATKINSON: I'm just down here, I wanted to say something.

MEMBER MAUNE: Oh, I'm sorry.

MEMBER ATKINSON: Well, actually it relates to relative sea level rise, too. But I think I've said it before, but the long-term tide record at just one tide station, Sewells Point, that data is influencing billion-dollar decisions right now. So it's an interesting economic benefit, literally billions of dollars.

RDML SMITH: I bet we didn't account for that in 1920 when we were putting it in there.

MEMBER ATKINSON: No, you didn't, I'm sure, yeah, but now. No, that trend is important, and you wouldn't have it without that gauge.

MEMBER MAUNE: Okay, the third topic that got the third most votes was relative sea level rise, and I know that that's a topic near and dear to the hearts of Larry and Julie, and I think Sean said he would like to participate in that and Neil Weston.

Somebody mentioned that we needed a baseline to see sea level rise relative to what. What is the starting baseline here? And I don't know if we're in a position to get going on --

MEMBER THOMAS: Can I just say two words about that because -- and Ed's name should be up there too because I know you had an interest.

How I see that evolving, would maybe set up a small subcommittee to address it, and I think the key there is to make -- I mean, that's such a broad topic, to make sure that we really tie it into NOS and what they're doing and how that's really going to -- how their efforts are going to be making an impact on the local communities and make sure we tie it all back.

And then maybe it becomes an issue paper down the line, but I would just suggest kind of tabling that and putting it out to the panel that whoever is interested if they wanted to be on a subcommittee.

And then we could set up a call or something and go from there. What do you think, Ed?

VICE CHAIR SAADE: I was thinking about the idea of taking a few these offline from the formal biannual meeting because we can run with these as much as we want and as far as we want as we do the call-ins.

We could make it a call in that everybody attends or we could make it a call in that's key to this focus. And that's an efficient way to move it along.

MEMBER THOMAS: Yeah, I just think that whoever's -- well we'll send out some email and say we're setting up a call or let us know or send your names on in if you're interested in participating or something like that.

VICE CHAIR SAADE: That's a good way to get folks engaged.

MEMBER THOMAS: We'll get it going outside of this meeting if that's okay with people.

VICE CHAIR SAADE: I agree.

MEMBER MAUNE: Sure. Anybody else on that topic? Yes, Larry?

MEMBER ATKINSON: I just wanted to add one thing we could do when we're down with Sean, we could have a session on subsidence for example or whatever in the same -- or when we're in the D.C. area.

So this might be a continuing thing and whether we do a white paper or not, we'll figure it out.

VICE CHAIR SAADE: We've got another threshold we have to beat. We have to be four days in a row above the fold on the Washington Post when we go to Washington D.C.

MEMBER ATKINSON: That's going to be really hard to do.

MEMBER MAUNE: Okay, moving on, the fourth place was tied with two topics, one was enhanced navigational assistance, and I think that really showed that a lot of people are interested in PORTS and in precision navigation.

We've had several iterations of the precision nav issue paper, and I don't know if there's any need for updating it or not, but four people voted for that.

And then four other people voted for the public private partnerships for the blue economy, which is something that Ross Calendar asked us to look into in Miami.

MEMBER HALL: But he's gone now.

MEMBER MAUNE: He's gone now, but it is interesting. The blue economy is certainly something of interest to Tim Gallaudet over there.

MEMBER HALL: Yes, he's talking at our meeting.

MEMBER MAUNE: He lives and breathes the blue economy all the time.

VICE CHAIR SAADE: Here's a question for the group. Should we redo this every six months or a year or should we keep it fixed? What do you guys think?

MEMBER MAUNE: Then it becomes a question of well, we're interested in that, what are we going to do about it?

And I'm not sure what we can do about public private partnerships, what recommendations we might have to the NOAA administrator.

MEMBER HALL: But I think the point of the follow-on things is do we want information? Do we want to talk about it? Do we just want to keep track of it?

That's what we did with U.S. Army Corps. We said, hey, we just want to keep track of this because it's something that's a consistent thing.

So I think what we need is we did this last time right after the Miami meeting, we do that again but we do the follow-on on what's your expectation? Do you want to know more?

Are there enough votes for an issue paper or are we still learning about it? And I think we've done that and we've gone back and forth with Technology Working Group papers and said, you know what, actually not a paper yet. Or, hey, it's too fast-moving or, yes, we need it.

I think it's to continue a conversation and I don't think any of this is fixed but I do think we need more information about what folks really think we're doing. And I'm not sure it takes extra subcommittees to do that.

I think it really takes just asking the question and if it's someone like me, there was a couple things that before I joined this three years ago I didn't know anything about. Now I feel like I'm a little further along, but we have new members coming along so how can we bridge that gap?

And if there's more people saying I need information versus more people saying I want to write a paper, then we have a better idea of where we are as a Committee, as a panel.

And so I think it's really important to do that but I think it's also important to understand the expectation for each of those topics from people.

MEMBER MAUNE: The other topics that got fewer than four votes include education, promoting hydrographic education, that got three votes. Incorporating non-authoritative sources from crowd-sourcing, satellite-derived bathymetry example, got two votes.

Arctic charting only got one vote, interesting. I want to take a vote again and we'll get a different result.

Managing big data and databases got two votes, technology transfer got three votes, USACE NOAA partnership got three votes, Science Advisory Board cross-pollination got three votes, hydrodynamic modeling and validation got three votes.

U.S. Coast Guard and AIS got one vote, hydrographic survey fleet only got two votes, though we've had issue papers on that, and then we had NOAA's application of IoT, artificial intelligence and M2M, that page got one vote. That's it.

MEMBER SHINGLEDECKER: I would challenge you guys as a group to maybe use this as a forward-looking planning mechanism kind of as what Kim said. So of these topics, which of these do you want to have webinars on to get more information?

Which topics might inform where you want to have a meeting because you want local stakeholder feedback on it?

Then with that information, okay, as you have more information, then is an issue paper needed, is a subcommittee needed? And maybe rank those after each meeting because I do suspect some of those rankings would change if we reranked today.

What I would also challenge you guys to do is something I don't think we've done in a while, is kind of a -- use that as your forward-looking but also have a backward-looking tool.

A while ago I know we did, we went back and we took all the letters that we had written to the Administrator over the last five years, and we pulled out each of the recommendations and said where does that stand now?

Okay, we made the emphasis, we made a recommendation, was it actioned? Was it not actioned? Is it still relevant? Has it changed?

As a way to hold accountability to it and just make sure that the work that we're doing as a panel is getting the results that we hoped for and use that to inform, okay, well, if it's changed what more do we need to know?

So I would just say a forward-looking and a backward-looking would be a smart way to go forward.

MEMBER MAUNE: One thing I can do is I could start with these topics but before we vote again I would want to get suggestions from the members on what topics need to be added so that we have an updated list of nominated topics for everybody to vote on.

That to me would make more sense to see how we update this list. Lindsay?

MEMBER GEE: I think I agree with Susan totally.

I think if we take away the papers, these are issues that were all obviously voted on but that were raised, and they're issues that should I think also for communicating to NOAA what we're interested in obviously.

And there are some areas where we really can't do anything because it just highlights an area that we think we should be addressing that a lot of times I feel I don't know enough what NOAA is doing already.

And they may already be addressing some of these things. And some, again, are so general, public- private partnerships versus autonomous vessels, I mean, they're quite at the extremes.

PORTS is a solution and public- private partnerships was just -- they must throw it out there. And I think we need to maybe address that.

But having those there is good because I think if we do address it early in a meeting and we refresh our memories of what we said last time, I think if I look back now at this meeting, I look at public, private, nonprofits and I think, well, wow, look at the partnership with Marine Exchange -- this is a solution that's working in a particular area and you can take it under that topic.

Relative sea level rise up in Alaska, it's like, well, we have no fricking clue what's up there because there's no data and we haven't connected it. There's no infrastructure.

So that focuses my mind and says, okay, Juliana and the CO-OPS team and all that, they need to then have support to get the basic infrastructure to even think about that.

So that's the way I would address this as opposed to looking for papers to write, it's more like, okay, where do we think there's issues that we can actually -- and it has to be somewhere where we can have an input as an advisory panel.

There's really interesting stuff I'd love to talk about more with different folks but it's like, yes, it's not our role in this panel I don't think.

So it's important to just address a group of issues that we have not in the forefront but are there that we see as the bubbling issues that we want to address and help NOAA move forward with I think.

MEMBER PAGE: Can I ask --

CHAIR MILLER: I think you should also look at -- this is a priority list. We have done things recently.

There's not just these, there's the papers, there's the recommendations we've put into the letters, and a lot of times the recommendations in the letter is a very hot topic from the meeting we go to.

For instance, I think perhaps one recommendation from this meeting would be on the AIS issue. That's not high in this priority list, and one of the things I did when Kim started this matrix was I put in a column to tell new panel members what has been done recently.

Issue paper in 2017, letter recommendation in 2016, so you can see where, like Susan was talking about, we've gone in the past.

And for instance, on the topic that Sean brought up, the Army Corps coordination, Sean, what I would encourage you to do is go to the papers and look at the paper that Bill Hanson and I were primary on called Improving Access for U.S. Nautical Charts.

Buried in that, because it's a sensitive topic, is the U.S. Army Corps NOAA relationship, and so you need to look at that and see if there's some way we can improve that issue paper because it has been addressed.

I'm not saying it shouldn't be addressed again, but maybe we need an update on that paper. So there's a lot of resources there, and there's a lot more information in this matrix than is what is up on the screen.

So just be aware of that.

MEMBER THOMAS: Go ahead, Ed, I think you were before me. I was just going to say that regarding the Corps, I'd actually like to broaden it from just the charting and the channel issue and the quality control of their data.

Because, gosh, in southern -- we get Corps dollars for sea level -- for beach erosion dollars, we get Corps dollars -- the Corps is the primary funder of the wave buoys, the 71 wave buoys around the coastal U.S. If those dollars don't continue it all goes away.

There's also quality control, and they do work really closely with NOAA on a lot of those topics I think, and I think the coordination with NOAA is essential.

So I don't know how you feel about that, Shep, but I feel like it's a broader issue than just the nautical charting too. And I don't know how much of that is particular to this committee is the only thing.

The beach erosion for sea level is actually very -- and we fly light with Corps dollars and do a lot of vertical datum stuff with the NOAA dollars. But I just bring it up that there are other partnerships with the Corps too.

MEMBER DUFFY: I would just like to respond and say I'll be happy to read that paper, but I think in maybe a way this is more than a paper.

When we're talking about a partnership and working to develop it, maybe being an action item and as you know, I'm new here and I really don't want to be a troublemaker, but this is something I believe that would be very important.

And just trying to facilitate that, as we look at panelists, I mean in both of the meetings I've attended, we've had other government agencies, and I think that coordination and cooperation is key.

And, again, I really would like to help that maybe not having it as a paper isn't a good thing.

I'd be happy to put together what I think the partnership should look for and come back and hopefully that could be supported and maybe it will take away one of the papers.

I've seen the wordsmithing that goes on, and, of course, I know words are very important as you'll remember from this morning. But it's more of an idea in my mind than if there's a way to facilitate it, I think at least in the areas I spoke about, I have the relationships to help make that better.

And hopefully -- I will say that I've spoken to Corps at Headquarters level, and there was an interest, and I think we'll get away from the overlap in the missions.

But at the end of the day, through cooperation, I mean, when we have a hurricane or an oil spill we're talking to the Corps and NOAA and the Coast Guard and Customs all in the same call and all in the same mission.

So having that partnership I will say again I think is really important.

Thank you.

MEMBER HALL: I think this is key to looking back, what Susan said. We need to because when I first started this was a huge -- you took over for a big name in Army Corps too when Bill Hanson was on the panel.

So I want to make sure Sean understands it's not an issue that we don't take seriously.

I think what we do need to do and I think Susan's got a great idea there is somebody needs to go back and look because we made these recommendations, we've had wonderful presentations from Shep specifically about this and the things that he is doing and his office is doing to ensure that partnership.

And so I think maybe we have not done a great job of supporting our new folks to understand the past of this panel.

So I think that's probably a next step once we figure out what we really want to do with this but preparing these folks for success when they get here is a huge key thing.

Because I think some of us are sitting around the room going, yes, we really understand the Army Corps issue because it usually comes up.

It didn't come up here, and we're just making sure that we put our efforts where we really can and wait for NOAA to push on us when they need our support.

But, Sean, Shep can probably talk to you offline exactly what he's up to with that ACE relationship.

MEMBER KELLY: Ed Kelly, here. Sean, it's way too late, you are a troublemaker. But I think we have to differentiate the paper is strategic, but the tactical portion of this is what you're talking about.

And the paper is one thing, that's strategy, tactical where we have to actually set up individual meetings with specific objectives.

I think we have to move that a little bit more, and that's more what you were talking about and what the MOUs with the Corps and everything else that you folks have already started to work on.

So it's where we need to go, it's very valuable, but I think we don't want to trip up strategical and tactical and try to assume it's all one package. They are separate things.

MEMBER MAUNE: Okay, everybody commented? That's literally all I have, Ed.

VICE CHAIR SAADE: Good lively discussion, thanks, Dave. What's next on the list?

So we do have a couple of issue papers that have been brought up. First of all, Gary, go ahead and give a little bit of detail of what's your perspective on this.

MEMBER THOMPSON: So we've talked about the datum change in 2022, both horizontal, vertical, and Nicole talked about they've created a working group here in Alaska, and we've done the same thing in North Carolina.

And what we found out is that we need to talk to each group about how they'll be impacted a little bit differently. So we've written papers in North Carolina for the agricultural community for professional engineers, surveyors.

We've tried to -- and I'm writing -- I'm meeting with the lawyers next week, and they're very interested in it. So I think it would be good for this group too because we have users like recreational boaters, how it will impact them.

So I think having a paper more not down in the weeds but more of a general overview and how that would impact the general population would be a good paper to have.

I think we can take from the other one the basic information but then stay away from the deep technical part and just examples of how it will impact them.

MEMBER MAUNE: I will say from my experience that we're going to get a lot of resistance from some communities to this and from some of the states for changing their state plan coordinate system.

I'll give an example. My county of Fairfax County, Virginia is normally considered to be a pretty progressive state, but they are still using NGVD 29 vertical datum, and I am delivering lidar data of Fairfax County this year, and they first asked for NGVD 29 data, and now they're asking for both.

So they are saying, okay, deliver it NGVD 29 and also deliver it in NAVD 88, and then they said in 2022 when the new vertical datum comes out, they may consider switching from NGVD29 directly to the 2022 datum, bypassing NAVD.

And if a progressive county like Fairfax has that kind of issue with the datum change, I can imagine there's going to be thousands of others out there so that's going to be a lot of challenges out there to make this happen.

And I know Juliana knows that very well. You've done everything I could imagine you doing to prepare -- but it's going to be a hard sell for a lot of people.

MEMBER GEE: I'll just comment on that. I think that's what Gary is talking about. You understand that you were having the problems delivering it and it's like why are they still resisting, and I think that's what you're saying.

It's like, well, here's why you need to worry about it, and I think that's what we kind of have to -- the simple -- we understand -- well some of us understand the technicals of that, but it's like for the average person, it's like why are we investing money in it and what's the benefit?

And why do you not have to worry about it so much?

MEMBER THOMPSON: And also explain to them they may not have to worry about it because it may just be a relative change and inform them of that so that when they read something in the paper they'll have -- we'll provide them the information and make them aware that it's really not going to impact you.

It's just really a change in numbers. So I think the paper needs to explain, yes, there's some areas it will impact and some areas it won't.

MEMBER GEE: So, again, if we're writing issue papers to the Administrator, we're saying that NOAA have to communicate this better to the public. That's the kind of thrust?

MEMBER THOMPSON: Right.

CAPT ARMSTRONG: That's kind of the point I was going to make.

I think we need to be clear on our paper what advice we're giving to NOAA on the subject, and I think if we feel like NOAA's communications need to be upped a little bit, then that's advice we can give.

But straight to the public I don't feel is appropriate.

VICE CHAIR SAADE: That's what I was wondering. What would be our position? But I think that's a good approach, is to point out maybe what the inconsistencies are and make recommendations on how to improve it.

Because we all understand it because Juliana explained it to us.

MS. BLACKWELL: This is Juliana. So we would love to have as much support and ideas of how to do this better as you all can come up with.

But I think what I'm hearing is it's not really appropriate for the group to put out this paper, one-pager or whatever, but if there are -- please clarify if I'm misunderstanding this -- the direction of having one-pagers or having outreach that is really, really light on the technical and just really about the impact and why people should care.

It's definitely something we should be putting out, but we would love to have ideas from HSRP on things to highlight or groups to focus our message to and just feedback on here's an example of what we've come up with.

Informally, does this meet what you're expecting? So I think anything that you can provide, even if it's not from the group, if it's individually that you want to provide feedback to NGS on our communications materials or have things that you think you should highlight, we welcome that.

But I don't see where it would be an official HSRP document to do that. But obviously, I think one of the hardest things is getting the right message to legislatures, at the state and at the federal level, about what we're doing and maybe just giving them an awareness of this as it's coming.

Because there are going to be issues, there are going to be plenty of places that are going to be challenged by this update, and we know it's going to take a long time.

But anything we can do to get the message out there to the greatest numbers possible, we're very happy to have suggestions from you as individuals and HSRP as a group how we can do that better.

Thank you.

MEMBER MAUNE: Thank you.

VICE CHAIR SAADE: So I would recommend maybe if you jot down, you or whoever else wants to grab a couple of these things.

There's an anecdote from Dave and a couple of the things that you're seeing, Gary. We can use those as an example of why we think there's concern and make advice that way.

Sound okay?

MEMBER ATKINSON: Yeah, I have kind of a tongue in cheep statement, but I remember -- tongue in cheek, not cheep, in Y2K. I can just see headlines, sea level is going to rise two feet in North Carolina January 1, 2022. People will not read it right.

MEMBER MAUNE: And by the way, I hope my comments weren't interpreted as being any criticism of NGS. I think they're doing everything I could think of to do, it's just going to be a difficult problem, and I have no recommended changes for NGS myself.

I know they're busting their butts to keep people informed. They have these seminars all the time, webinars all the time, and people up there, there's a great deal of interest in the topic.

It's a very complex issue, and there's going to be gripers, but it's not because NGS isn't doing anything I could imagine was needed. They're doing a good job now from what I can tell.

VICE CHAIR SAADE: Okay, then, Julie, did we have one other topic for new discussion for this morning?

MEMBER THOMAS: I don't think so. Did we? Oh, well, there were two issue papers but, no, one was talking to Gary.

The other one was I think we just said that eventually sea level might turn into an issue paper, but I thought we were going to meet as a committee first and discuss that, and it might not be an issue paper depending.

That's what I was thinking, and the issue paper with sea level wouldn't be -- once again, I think what we need to do as a subcommittee is decide between NGS and OCS and CO-OPS, you know, how the sea level is going to be impacted by this and what is going on in those lines.

So I think that we really need to meet before that's formed or written. That's what I would say. Sorry.

VICE CHAIR SAADE: Okay, let's jump over to the key points of the meeting that we're going to include in the paper.

MEMBER THOMAS: In the letter to the Administrator.

VICE CHAIR SAADE: Yes, so if we can agree as a group what the key items are that we're going to forward up the chain relative to this particular meeting besides the long list of thank yous for the attendance of some really key people.

MEMBER THOMAS: So I did jot down just a few key points that I thought.

VICE CHAIR SAADE: Is there a way to display it?

MEMBER THOMAS: It's in my Word file with a ton of other notes. So we can --

VICE CHAIR SAADE: You could say it out loud and somebody could --

MEMBER THOMAS: Let me say it out loud, and we can always type it in there and just display it, Virginia.

VICE CHAIR SAADE: That would be ideal, yes.

MEMBER THOMAS: Well, one thing, first, is just acknowledging this joint meeting, this has already been said, between IOOS and AMEC, right.

And first of all, I think we should acknowledge Admiral Gallaudet's presence and that how excited we are, but let's not wordsmith it now.

Let's just put down Admiral Gallaudet's recognition of being -- acknowledgment of being at the meeting, appreciation of being at the meeting. And then two is this --

VICE CHAIR SAADE: Just a second. Do we have a way to --

MEMBER THOMAS: Virginia is typing this in right now, and then number two, what I put down was the advantages of having this partnership between AMEC and IOOS at this meeting, their attendance here.

MEMBER HALL: I have a question about that, and it's something, luckily I've had the pleasure of talking to folks that have been around a little bit longer than I have on the issues of -- I didn't realize -- I don't think I ever knew that Bill and Susan had gone to an IOOS meeting and briefed them.

So again this is understanding the past to figure out where we are in the present. So I think it's a really good first step to have that joint session, but I think we really missed something key which was interaction.

We got the same briefings, but I think there's a point there moving forward where wouldn't it have been nice for IOOS to tell us what they were working on in relation to us, us to tell them what we were working on in relation to them and have a conversation?

And I think that dialog didn't happen. We were all just sitting in a room together. I'm not trying to be too harsh on that, but it really felt a little bit like that, and I would have loved to have figured out where are our common nexus here?

And part of that is letting them understand what the bounds of HSRP are and us understanding what their bounds are, but there certainly must be things that cross over.

And I think we missed a key opportunity there, but I also want to just say I understand it's an iterative process. Everything we do on this panel is iterative, and we learn as we go, and so I would just say as we move in the future, I think we should praise what happened with IOOS and AMEC, but I think we should also recognize as a panel that we should be getting a little bit more out of those sessions.

So I just want to put that out there.

MEMBER THOMAS: Maybe we can -- I mean, we'll take that as an idea for our next meeting in D.C. There will certainly be lots of opportunities to have a couple-hour overlap, and maybe we can set up even an informal discussion.

MEMBER HALL: It has to go in our letter, too, just that we want more. Right? So that's my point, like --

MEMBER THOMAS: So, Kim, just to let you know, we already have -- I don't think that was announced. We already have a response back from IOOS this morning from Admiral Lautenbacher, and Ed and Joyce have that.

So definitely there will be a section of the letter which addresses this joint meeting with IOOS and where we want to go from there.

But my problem is I just assume everybody knows about IOOS because I've been with it so much, but it's like IfSAR, if you're not working with it then it's good to know more about it.

VICE CHAIR SAADE: So let me go ahead and read this paragraph, and then we can also decide whether it all goes in or pieces that we want to steal. Okay?

In welcoming us to the joint meeting of the IOOS Advisory Committee and the Hydrographic Services Review Panel in Juneau, Alaska, Lieutenant Governor Byron Mallott eloquently articulated Alaska's affinity for the ocean and the importance of ocean data and information to their daily lives.

He described the cultural foundation and collaboration and cooperation that are necessary to meet the challenges they face.

The importance of coordination was well illustrated by the special session on Alaska water level partnerships. The session was bookended with presentations by the CO-OPS Director Rick Edwing and AOOS Executive Director Molly McCammon, bridging the Committee interests and underscoring the connectivity of ocean observing across NOAA programs.

More significantly, stakeholders/data users on the panel from the National Weather Service and Alaska Department of Natural Resources described how their close relationship on management and integration of the data was leveraged and other data to create improved weather prediction and alerts, as well as management of coastal hazards at the local level.

The joint session made it clear that substantial benefits can accrue to the IOOS system with planning additional joint meetings across NOAA observing program and other advisory panels, with the goal of identifying potential common issues and opportunities.

Okay? So I think there's a few items in there that we can obviously bring in to the discussion. I don't think it's a paragraph that stands alone by itself.

I think it's a really good idea to add to our little list about the Lieutenant Governor because he really did have an impact on everybody in a unique way.

I'm sorry, I can't hear you.

MEMBER HALL: I'm terribly sorry. Is there an expectation of a joint statement from them given the title of that slide?

VICE CHAIR SAADE: Not that I'm aware of.

CHAIR MILLER: Let me steal the mic. We just discussed having something that we could both put in our letters or use together. It wasn't absolutely clear.

I had hoped that perhaps there would be more of a quasi-recommendation other than further collaboration, some driving need from the water level panel or something, but we didn't get that.

But then I talked to Admiral Lautenbacher after the session this morning and he said he was sending me more things but I haven't received them yet. So it's so in flux I'd say.

MEMBER THOMAS: And we did have that scheduled on the agenda to have that discussion at one of the lunch hours, it just fell apart.

MEMBER HALL: I'm just looking at the title, Joint Statement. So we're talking about our letter versus the joint statement. Those are two very different things so I just wanted to understand expectations.

VICE CHAIR SAADE: Okay, that's their contribution to the joint statement.

MEMBER THOMAS: Well, we don't know because we're getting more from Lautenbacher, too.

MEMBER GEE: I kind of agree. I think there is no specific thing we can put a finger to say apart from, just a general, yes, we should -- potentially maybe common issues.

I certainly don't remember anything specific that we could come out of this meeting and say, oh, yes, we're going to do this together, a specific area.

And so that I think is, to Kim's point, if we had had a broader discussion, maybe we could have that the next time, that that becomes the next phase of it. We should then start to think about identifying those potential issues that we can then cooperate on specific items.

CHAIR MILLER: My thought was that there might be some recommendation that came out of the whole water level panel that might be common with HSRP and IOOS. And if that didn't happen, that's fine.

MEMBER THOMAS: I'm putting it in the notes for the next meeting because I've got a Section also on that.

MEMBER HALL: Just real quick while you're doing that, I really appreciated having my lunch, though, so I appreciate it. I think some of us sometimes like to have a little bit of a break.

We get a little bit inundated with information so we like the flexibility we had at this meeting. So, whoever facilitated that, thank you very much.

MEMBER THOMAS: So shall I go on with -- I put down a couple more topics for the NOAA Administrator letter. Virginia, you very nicely typed in those first two.

Perfect, okay, well, we're going to have to come back number two after we receive all of Admiral Lautenbacher's comments. And we'll circulate them and come up with some joint statement there.

MEMBER PAGE: I'm not so sure that I think, what Kim is bringing up, I don't know if we need to have a joint statement.

So that's off the table. It's not a joint statement, it's a matter of if we want to mention a relationship with IOOS in our statement, I think.

There might be some confusion because I think there's also a discussion that Julie and I would look into some joint document to kind of outline what the relationship might be with HSRP and IOOS in the future.

And that would be a joint deliberate prepared document. That's not a joint statement but it's something that we can kind of socialize between our two different organizations.

And then we agree once a year or whatever, some way that we might have more of a relationship with them than we've had in the past.

And so that might be a different -- maybe to think in that context. But in any case, I think this is our statement if we want to mention IOOS, which I think it has some merit. Maybe the last paragraph portion of it might be merit and would be worth incorporating. Other than that, I wouldn't really get into it. That's just my two cents anyway.

VICE CHAIR SAADE: Agreed.

MEMBER THOMAS: Okay, there's some mention -- oh, boy, this is not correct at all -- but some mention about to me this lack of vertical datum, lack of shoreline, just the critical nature of mapping in Alaska and capturing the infrequent -- I don't know, observations up here.

Ed, you're better at this one than I am or Juliana or someone. This lack of defined shoreline of --

VICE CHAIR SAADE: I think that was an extension. My notes was that, and I got this from Admiral Smith on Monday, barge navigation in general is a big, big deal.

MEMBER THOMAS: Barge navigation?

VICE CHAIR SAADE: Barge navigation and bringing things to all these villages up and down the Bering Sea and on the North Slope.

And I think we need to make some mention, however we want to say it, we have to emphasize the fact that the barge navigation aspect of things that go on in Alaska needs support and needs attention.

MEMBER THOMAS: And so maybe that's kind of a lead-in, too, because then we can put Admiral Smith's little quote in that he said that I thought was so poignant too about how they need to support these user needs as they go into these remote locations or whatever.

CHAIR MILLER: But always think about what would you recommend to NOAA once you make that statement?

MEMBER THOMAS: Well, this is exactly that, that NOS needs to continue to keep in mind the user needs, particularly in these remote locations where there are such unique challenges and using the new technologies, using -- basically think out of the box.

VICE CHAIR SAADE: Okay, so from my perspective, when you start talking about merging the terrestrial data with the bathymetric data and you move that datum through the shoreline, by definition you help define some of the requirements and the needs related to barge navigation, for instance.

So all of it ties together in my mind. However, we want to say that, it all ties together.

MEMBER GEE: I think part of that is the requirements to do that is some of the fundamental infrastructure and data that needs to be put in place, which embraces all of the three sections of NGS.

It just has to have those CORS stations. We support having them, maintaining them in the expansion, same thing for CO-OPs in all those observations and then that's with the ongoing shoreline establishment and mapping.

And to do any of this, I think what we can say here in my opinion is because it is the frontier, it highlights the requirements for those things which we've discussed in other areas about the need for them. But seeing it in Alaska and seeing it in a frontier just highlights the need for the investment in that core data and observational infrastructure, something in that.

MEMBER THOMAS: Well, just a critical need to maintain CORS stations or something like that that will remind us that we want to put some statement in there.

CAPT ARMSTRONG: Seems to me we're conflating two issues here, one of the issues is underlying datum-type information and the other issue is the need for barge navigation between a couple meters of water depth and the shoreline. And so I think those --

MEMBER THOMAS: The two different ones?

CAPT ARMSTRONG: The two different things, the last mile issue that Admiral Smith responded that we don't always stop at four meters but in many areas, that's our policy and so we need to be sure we acknowledge that in these areas it's different.

MEMBER THOMAS: So I think we want to break number three, where it says barge navigation, just put it on the next line and then we'll have to flesh out the wording exactly.

Let's see, I just have two more things, one was this AIS Coast Guard issue that's come up so often. I think we want to acknowledge continuing support for investigating and whatever we can say they're pushing that forward.

CHAIR MILLER: I would strongly support that. I talked to Mike, the Coast Guard guy, and he said he needs a push from somewhere and certainly the collaboration between Admiral Gallaudet and the Coast Guard, the leader of the Coast Guard, is a good opportunity.

He said they need a push to get it over the one-yard line, I guess you'd call it, and so I think that's an important one that whatever NOAA can do to facilitate that last one yard would be excellent.

I think that's a strong recommendation and it's doable, it's not new money. When you make recommendations, that's what you have to think of, what's doable, what makes sense.

It's kind of like we've used in the past, instead of saying more money, say prioritize funding. That's very different language than always asking for more money.

MEMBER GEE: So, in our letter to the Administrator with the recommendation that we acknowledge and support his contact and interactions with the Coast Guard and by that contact he addresses what we saw as a key blocker in the dissemination of the information.

CHAIR MILLER: Strong advocate would be a good word.

MEMBER HALL: I'm not sure this is prioritized funding, I think that's just an example she was using.

RDML SMITH: I even asked the Coast Guard specifically whether there's a money issue and they said absolutely not.

MEMBER HALL: Can you just put it up there? I was just letting her know.

MEMBER THOMAS: Just take out the prioritized funding right there, thank you. Juliana, did you have something to say?

MS. BLACKWELL: Yes, before we go too far along with new bullets, I'm trying to understand what the last sentence in number four is and critical needs to maintain CORS stations. So if it's the NGS CORS station -- is that what we're referring to? -- then it's not just maintaining it if we're going to establish. So I just want to make sure that --

MEMBER HALL: I think it's going to have to be wordsmithed.

I think we are relying on poor Virginia to type as we go so I think this is just reminders for -- I don't know who is writing the --

CAPT ARMSTRONG: CORS stations don't go in number four, they go up in number three.

MEMBER HALL: Right, they go up in number three. But I think these are reminders for whoever's writing the paper but I'm not entirely sure who's writing the final letter.

MS. BLACKWELL: Once we leave here and we look at it again, we're going to go -- so if we can at least just put it in number three then that makes more sense.

Okay, thank you.

MEMBER GEE: Just to be clear, that's the establishment and then operation of the CORS stations, right?

MEMBER THOMAS: Critical needs to establish and maintain. Okay, I'll just breeze through two more I had and then anyone else is open to whatever.

I would like to -- also may we include --

MEMBER HALL: I'm sorry, real quick, when it comes to the AIS issue, I think we need to recognize Mike Emerson who was here, because he's the equivalent of a Rear Admiral.

He's an SES at Coast Guard so that is a big deal that he came out here from Washington D.C. and I'm not sure everybody understood that, that he is the Director of the Marine Transportation System for the Coast Guard.

So I just want to make sure if we're acknowledging Gallaudet, which is huge, I know he's a level higher, several levels higher, as an Undersecretary, but I think we need to make sure for this one too, as we get into our acknowledging things, that be something that we really ping on because for the Coast Guard to do that to give him up for a week to come out here is a big deal.

MEMBER THOMAS: That's fine. I think we can thank CO-OPs for the document review, the opportunity for reviewing their strategic operating plan, is that what it's called?

And then the last thing that I have, I'm not quite sure how we want to -- but we had two Native tribal panel speakers and I thought maybe we could put something in about how their unique perspective or their insightful perspective was --

VICE CHAIR SAADE: I think one of them is recognizing the Lieutenant Governor in the words that were actually in the document from AOOS was pretty nice.

We can work on that and then definitely, we want to recognize Willy today.

MEMBER THOMAS: Willy something. I think it would be nice to recognize Willy Goodwin. It's our local context. So those were the ones that I captured.

CAPT ARMSTRONG: Just to add to that list, given our little faux pas with the applause, I think we probably ought to make note in the letter how pleased we were that we got to video it.

VICE CHAIR SAADE: And we gave her a standing ovation at the end.

MEMBER HALL: And I think I did say that. We'll do all this of merit, everything that we needed to do. The reason I brought up Mike Emerson is because I don't think we recognized who he was here.

Are we going to go around and do just a quick round robin on what we think?

MEMBER THOMAS: As far as I'm concerned, yes.

CHAIR MILLER: I've got a couple more that I think -- okay, so there was the gold standard issue and being able to combine.

And I think Rich's start on the Tier 1, Tier 2, Tier 3 is excellent. I don't know if we want to say anything about that or not.

And then I thought a really important one, which kind of goes with the AIS thing, was how to communicate data, that would be a separate one. Throw darts, but I thought those were two important things that we've heard as well.

And by the way, for the new Panel members especially haven't been -- usually, the format of the letter that we've worked out over the past four years, which was sometimes very painful, is that we write a short paragraph in front that acknowledges the most important people.

I don't think in this case we can acknowledge everybody, that would take up a page in itself, all the USGS people. We give the primary recommendations immediately after that and then we have one and a half to two-page meeting summary.

So, one of the aspects of writing this letter since I've been lead on it for a while is figuring out which goes in which bin.

Who are the most important people to acknowledge and one of the things that Shep pointed out is that Admiral Gallaudet was here for much of the meeting so how much we have to explain especially in the letter or how much we have to honor various people, especially in the letter, some or a lot of that could be moved back to the meeting summary that follows.

So that's just sort of a brief summary.

MEMBER THOMAS: And that did just remind me that we probably want to acknowledge or say how pleased we are that he's also on the Joint Committee with AMEC and when we talk about the joint things.

VICE CHAIR SAADE: That's on my list.

MEMBER THOMAS: Okay, other people?

VICE CHAIR SAADE: To be efficient, let's go ahead and get the list, anybody that wants to add anything to the list, but let's kind of do it in an orderly manner so we can just move through here.

So you go ahead and start Larry.

DR. MAYER: I'm always last.

VICE CHAIR SAADE: Okay, sorry.

DR. MAYER: But I'll start anyway.

MEMBER GEE: Sean was complaining he's in the middle. Maybe he should start.

DR. MAYER: I'll go ahead.

VICE CHAIR SAADE: You only get to do bullet items.

DR. MAYER: One is we spent a lot of time talking about how thrilled we were with what we saw at the Marine Exchange and yet, that is not acknowledged.

And I think there's more than just an acknowledgment of thanks to Ed Page, I think there's a message there in terms of providing a community service and a critical one and private government partnerships and things like that.

So I think should probably be touched upon and use those as a good example. And the other is something, and this may be very premature because we really didn't discuss it, Andy and I just threw it out in response to the Lieutenant Governor's statement.

And that was this thought that, and this may go in bullet four, I don't know, that maybe the idea of a small boat presence of NOAA in the region here, because of the uniqueness of this area, might be something to think about.

But there may be real ramifications to that that we should think through. That might be something for the panel to think about.

MEMBER PAGE: Yes, so we might want to think about that one first but this would be the place if we --

VICE CHAIR SAADE: It's good to have it on the list. Andy, you're next. You're done? Okay, thanks. Sorry, Ed.

MEMBER PAGE: Yes, I agree with what you said that actually, the Admiral was here for quite a bit so it doesn't require too much explanation.

I'm thinking just kind of about the Marine Exchange, which I certainly appreciate, Larry, bringing it up.

I think also you can almost comment it is a tool that can be used to help NOAA implement some of these initiatives in Alaska because we're already doing some of that.

So it's a good partnership but also -- not thank me but say, great tool for us to help us implement these things in a unique, challenging, new marine environment.

That's all. That would probably be good, I think.

MEMBER THOMAS: It's number eleven.

MEMBER PAGE: But I think all the other stuff really looks great. I'm trying to figure out how to condense the thing.

I guess the other thing, did we really mention Arctic necessarily on one line somewhere along there?

And maybe it's almost inherently obvious but if nothing else, we thought the panel, thank you for these people, they gave us a better perspective or understanding of the challenges we have in the Arctic, the role of NOAA and the Coast Guard.

VICE CHAIR SAADE: Acknowledging the quality of the panel.

MEMBER PAGE: Now we have a better handle on what the needs are and what our work list is like so it goes beyond just saying thank you but this is what we're doing with that information. We're smarter as a result of it.

But that's a good list.

VICE CHAIR SAADE: Okay, we're going to skip Julie.

MEMBER MAUNE: Okay, I guess I'm up then.

I would like to acknowledge the joint meeting with the AMEC that is now co-chaired by Admiral Gallaudet, the importance of that and the fact that AMEC is now prioritizing bathymetric mapping and the integration of topographic and bathymetric data of the shorelines of Alaska, something along those lines.

It's prioritizing bathymetric mapping and the integration of topo and bathymetric data and the integration of topographic and bathymetric data along the shorelines.

And the AMEC now co-chaired by Admiral Gallaudet. Now co-chaired by Admiral Gallaudet; it used to be chaired only by USGS.

I would say AMEC, now co-chaired by Admiral Gallaudet. That is now prioritizing bathymetric mapping.

MEMBER THOMAS: We can get the spelling and everything down, Virginia, later.

MEMBER MAUNE: Now co-chair, yes. That's approximately it.

MEMBER HALL: Didn't the Admiral say this is the second time he had been the co-chair of that meeting?

MEMBER MAUNE: He said it's the second time.

MEMBER HALL: So do we need to tell him that we recognize that he recognizes that he's the co-chair?

VICE CHAIR SAADE: That's okay. This is really important, this is going to get mentioned.

MEMBER HALL: AMEC is completely important in the NOAA partnership with them.

VICE CHAIR SAADE: I don't think we should break with the way -- it's okay that he was here but this is the way we do our letters and if we break it, I think it's going to be a big mess.

MEMBER HALL: So my point was that we could just say it's NOAA working more directly with USGS and it's now almost an equal partnership.

I don't think we have to say good job, Gallaudet, you're the co-chair. I think we say, great job NOAA for taking on a leadership role with USGS.

I think we can find a different way to say it, which is effective, without telling the Acting Administrator --

VICE CHAIR SAADE: This letter goes in the public domain, correct?

MEMBER HALL: Yes.

VICE CHAIR SAADE: I think it's really important to say it's Gallaudet. It's more than just him that is going to be reading it. Sean?

MEMBER DUFFY: I'm just going to keep stirring my gumbo. I've said all I've got to say.

VICE CHAIR SAADE: Okay.

MEMBER KELLY: I think it's important that we recognize the benefit of the joint meeting and doing it here in Alaska that brought it out, the ability to see the relatively untapped potential of the resources available through the IOOS groups and the Marine Exchanges. And I would encourage NOAA to create a strategy to enhance the utilization of that synergy in getting local assets and specifically task them with items to look into and build together from a local basis where it can build up into a larger national project.

It's a mouthful but I just saw a whole row of people representing assets and each of those people represented probably 100 or more companies and organizations in each of the Regional Associations.

And we have such huge potential to get things that I personally am a Vice Chair of the MARACOOS of one of those regional associations and we make up our own path as to what we think is cool to do.

And I don't know, Julie, if you guys do the same but I think a more structured approach led by NOAA that could find ways to utilize those people as well as other national organizations with local roots, such as the Marine Exchanges, it could bring a lot of grassroots value into solving some of these problems.

MEMBER ATKINSON: I don't see much on the Arctic. We were shown things about the hub at Adak and I'm not going to give you a quotation but I think we just need more on the Arctic, the importance of merging part of the Arctic, including the -- I'm running out of words -- channels, whatever.

VICE CHAIR SAADE: Don't forget this isn't going to be the last time you see this so additions and subtractions are still coming in the weeks ahead.

MEMBER ATKINSON: I'll email it to you.

MEMBER LOCKHART: So nothing to type from me either, but I do want to let folks now what I thought was important from the meeting, and they're pretty much already covered here.

As kind of a techy person, I always like to think there is a solution for every problem and it never ceases to amaze me.

I come to these meetings and we're doing a lot of fantastic things in the way we collect data and get data, and we do a really bad job of making that data useable to the public. And so the example that came out of this meeting for me was the weather and the AIS and how the Marine Exchange is doing a wonderful job of doing that up here but the fact that doesn't happen on a regular basis nationally just astounds me. It really does.

And so things like that, I think, have to make it into one of the top recommendations for the letter because the data is available and it sounds like it's just a bureaucratic problem more than anything else, to make this happen.

It's the same thing with the Army Corps, it's the same thing with a lot of other problems we see at these meetings and we seem to just go on a repeat cycle with them.

I think the solutions are all there, we just for some reason can't get traction in enacting them. So for me, that was the one thing, was the Marine Exchange and the AIS stuff.

MEMBER THOMPSON: We heard from multiple speakers the need for more real-time data so I think we need to mention that in our recommendation.

MEMBER HALL: And again, I think this goes back to up to gold standard almost where you don't need -- the perfect is the enemy of the good sometimes.

And I think it goes with one of these and I'm not sure if it's the Marine Exchange because it was our best example at this meeting. But I don't know, agility, agility, agility, ingenuity, creativity.

Those are all things that NOAA cannot always do and I think that we're reminded of that almost every meeting but I think it was more evident here given what the Marine Exchange can do versus others in the AIS issues.

But I think efforts to increase nimbleness, if that's a word, Shep, are key to keeping hydroservices responsive to mariner needs and I think I am happy to send that sentence if people like it.

And it's, again, not necessarily new but certainly we can see how successful it is up here and then echoing what the Acting Administrator said, which you might like to hear, NOAA can continue to leverage those partnerships. And partnership is always a key things that we talk about, and where the bureaucratic red tape may not be so difficult to get around.

So that's the big key takeaway for me.

MEMBER GEE: There's a number of things that I think you have already covered. One is we mentioned the list but we didn't want to put the full list because there's too many.

I think that's a significant thing we should mention. I think it's the most I've seen at that level at a meeting. Maybe it's just because it's a nice place to come in.

That's to Juneau but who knows? There was a significant number of people that contributed at the meeting for sure.

Yes, the Marine Exchange again I think, and generally that kind of Alaskan attitude is like, yes, we know we're remote and we don't have all the resources and we get stuff done and we'll create solution.

And I think Shep said earlier that you're not trying to take that back. So again, I think I agree with Carol and Kim here that if you recommend that nimbleness and being able to be more flexible and somehow it's getting around that bureaucracy somehow and that should be a goal.

And relating to what Gary says, we're at sea and things change regularly and it's important that we do get real-time information. It's different to on land quite often.

I haven't finished but you can interrupt me.

MEMBER LOCKHART: Sorry, it just brought to mind that I think the other example up there of that agile behavior is the Tier 1, Tier 2, Tier 3 thing that AOOS has done.

MEMBER GEE: And I say this is not an additional point.

To be honest, I think there's a number that go together and that flexibility to be able to use what you have whether it's the gold standard or anything you have and just get on with it is something that we should be able to transfer elsewhere.

And I think in other places we see people complain about not having everything but then sit back and wait for the government or some other organization to get it to them.

So, that's a great example of a public-private partnership. So if we look at our issues, it embraces a whole load of what we do. One of the ones I mentioned earlier and I think it's kind of up in -- I've lost the top now. There was three which was the vertical datum and then there was also about AMEC. I too was pleased to see that getting to the blue bit, but it does highlight issues.

You can say, oh, yes, that's great, let's get to the topo-bathy but I don't know whether you can recommend it. But it's important to do that fundamentally.

You have to have that data and the infrastructure, you have to have the CORS stations. So they kind of go together and the water level observations and network have to be there, and you have to invest in that and it's not going to be cheap.

So I think somehow acknowledging that the investment of that in remote areas is going to be significant.

And even just to continue to operate those sort of things is not -- and I think you again -- briefly I talked to Rick after the question of the panel about tide gauges and current leaders and things.

And I think you already do that and you take a ship to a remote area and you try and do as much as you can so I think we have that flexibility within the organization in a remote area.

And then also taking that flexibility down into the other areas I think is key. Yes, that's it, thanks.

MEMBER SHINGLEDECKER: I would add that I was thinking about this and I think this is now the 14th letter that I've helped draft so trying to give that perspective to it to really challenge the panel that less can be more.

I remember Joyce and I battling, just going back and forth on some letters that just had twelve recommendations. And we really thought deliberately about how we wanted to structure the letters to get our primary points across.

The thank yous, the meeting summary as a separate document and then hit them hard with four or five.

I mean, we did come up with a number that we tried to settle on but try not to boil the ocean because it's really hard to boil the ocean and if you can really focus in on a few, I think that will give you the greatest benefit. If I were to add anything, I don't know that it has to be in the letter, I would just come at it from really the 100,000 foot level or even higher, that I'm just really appreciative in the current climate that this Federal Advisory Committee, and as Glen tells me, because it's in law, we're able to continue to meet.

But I think that's really worth noting or appreciating the priority that NOAA has placed on the work that we do.

You know, flying everybody out to Alaska isn't cheap, but the value that I have gotten from this Panel meeting in New York, meeting in Charleston, meeting in Louisiana, meeting in Alaska, and being able to pull all of our expertise, we each know one or two portions of the work of the three Offices.

But by traveling regionally and hearing from the regional stakeholders, I think it really allows all of us to apply our expertise on a much broader scale in advising NOAA and I just think that's really important and I think that should continue.

CHAIR MILLER: And a question, I agree with Susan greatly that we need to decide which are our three of four most important statements there. Virginia, on number ten, would you take out the word AIS?

MEMBER THOMAS: Joyce, so many of these are actually just remembering to thank something and we need to group them into -- do we really want to do it here? I was going to group them, put it into the letter template format that you have, group them by the thank yous, I'll put in the recommendation.

People can then prioritize via email is what I was going to suggest.

VICE CHAIR SAADE: I think that's fine and then we can start redlining things or yellow-enhancing them.

MEMBER THOMAS: A lot of these we can combine and just so much of this is just thoughts to get it in the letter one way or the other.

MR. EDWING: I don't have anything to add but I think it's number five. My must-have is the Coast Guard AIS. I really appreciate that being on there.

For the first time in a long time I'm starting to get a glimmer of hope that we may be able to move this issue. I certainly appreciate the thanks us for the strategic plan.

So number nine, I think this is maybe your potential joint statement or joint recommendation for IOOS and the HSRP because I think you could look at the collaboration between the federal down to the local as a model for other areas.

And I'm going to go back to a number of years ago, Zdenka Willis, the former Director of IOOS, and I sat down and we put together a strategic white paper on how can we in the IOOS Regional Association work together to gather more water level data along the nation's coast?

And from my perspective, I was looking to fill NWLON gaps but they obviously have these as well.

We developed that Tier 1, Tier 2, Tier 3 concept because we recognized we could talk all day about the spectrum of accuracy and things you're collecting water level to but until you have some ways of binning things and the tiering has a quantitative part to it, behind each tier there's an error budget and Tier A is our gold standard to why we need to collect things to that standard.

But also we grouped applications with those tiers which I think really help people understand how to use that.

And really, when we put out that we circulated that policy to all of the IOOS RAs and it was really AOOS that jumped up and waved their hand the most and said we really need to work with you for obvious reasons, but it is a model for perhaps other locations as well.

So I won't go on for too much more but I think you've got a series of words there but I think those can kind of be grouped into that kind of joint recommendation of, hey, we saw something really good here, this might be something to emulate in other areas of the coast that would benefit from it.

Not every other coast may need it but some do. Thank you.

MS. BLACKWELL: So, I won't add any either but I'll just also echo what Richard is saying but also include from the geodesy side which is already covered but agree that there may be a way to lump that together.

Because I think we all are trying to get as much relevant data that will meet our minimum requirements so that we can make better products, better tools for this challenging area. So there's an opportunity there but we are going to need to fill some gaps both on land and along the coast so that we can provide that information to Alaska.

And one other shout-out and that is to the Nav Manager and to the regional advisor that are here because making these meetings successful requires a lot of on-the-ground contacts and effort and I think you guys both did a wonderful job of supporting the entire HSRP in your Office Directors.

So thank you.

MEMBER GEE: Could I just add?

VICE CHAIR SAADE: Let others of us finish.

MEMBER GEE: I'm just making up for those questions that I got asked the other day.

We didn't mention actually VDatum specifically in that for the vertical and the topo-bathic and I think that's kind of important that that be in there as part of that vertical infrastructure comment.

VICE CHAIR SAADE: The three of us are left. Who wants to go first?

CHAIR MILLER: I already had my say.

VICE CHAIR SAADE: Okay. I have two things. in addition to the number of upper-level people who contributed to the meeting, I think we should add the number of Alaskans and everyday people that contributed to the meeting.

That was an impressive group of people that showed up every day and we should acknowledge it.

And the other thing to throw out there because it may be the point to mention it here was when the Admiral said the Critical Minerals Executive Order, and we're going to go grab all the minerals that are on the seabed on the Clipperton Ridge.

And I don't know if he said that in your meeting as well, Dave?

MEMBER MAUNE: It was discussed. I'm not sure that he brought it up. I think somebody else did.

VICE CHAIR SAADE: So, the fact that he took it upon himself to mention it in our meeting, I think we should at least consider referencing it. We can always throw it out, but I'd like to see it on the list to start with and then we can decide if we need to eliminate it.

It would be number twenty and it's the Critical Minerals Executive Order and we're going to, quote, study the Clipperton and expand to all of this, end quote.

Just put in the Critical Minerals Executive Order and we'll do the rest later. Okay, Shep, your turn. Take us home.

RDML SMITH: The two things that I think were mentioned and I thought reflected that I don't think made this, one is the implementation of the National Charting Plan and particularly building all those large-scale charts.

That's probably the most significant effort we're going to have in Coast Survey to deliver value from the hundreds of millions of dollars we've already invested in surveying.

And we can't be complacent about that because frankly, it's not funded. So don't assume that just because we're talking about it optimistically that it's going to happen.

If we want to make it happen we're going to need some help from the public and stakeholders to keep our eye on the ball for a decade to get it done.

And the second is the examples we had heard of small areas being really important and how the square nautical miles and percent covered is not a very good measure of cost or value for survey work, and that really targeted work can be really high-value.

And I think that's all I have to add.

VICE CHAIR SAADE: So I think we have enough material to work with.

So, look, we can keep talking about things, I just want to take a moment to make a tiny attempt to thank everybody and I know it's going to be a mess because we're going to leave some out, which is really terrible.

So I have a few lumped-in ones. So first of all, Lynne and your staff, thanks a lot, I thought this worked out great. And I think we should thank the folks in this building, this was a good setup here.

There's no windows but technically speaking, it really worked out well with the size. It was really nice that we could stretch out a little bit on the tables and the two-pound burrito was really good.

Joyce and Carol and Susan, of course. Personally, I'd like to thank the City of Juneau and Alaska, this was a really great venue and the weather was real, it was normal.

So we got a taste of that. It's a lot better than Houston, I'll tell you that. I'm going to mention Ed Page again because I know -- really, Ed, it worked out great.

The fun stuff, the technical stuff, your anecdotes and stories and everything just really added to the whole trip.

So thanks.

MEMBER HALL: About that specifically, I did submit to the three leaders.

Just a quick letter from us I think is really important, especially if we want Sean Duffy and his team to help us out for New Orleans to recognize our appreciation.

VICE CHAIR SAADE: I'm going to lump it all into the NOAA staff that contributed to making this happen and the couple of subsets of that would be Bart and Nick and then Laura.

Really thank you all, that really helped the process. Putting the panels together was excellent. Let's face it, universally every single one of the panels hit a home run, it was really good and really informative.

And I thank the panelists even though they aren't here, I thank the Congressional staff, that was a great turnout and as we mentioned before, the Alaskans that showed up and contributed to the whole thing.

So I probably missed about 50 people in that. All of our technical support staff here, yes, so thank you guys.

So I think that's everything that we need to get done. If there's any other topics that y'all want to talk about?

MEMBER PAGE: Can I just say one thing? At one point, Admiral Smith was saying nice things about our agility and ability to do things and how can we be like that?

And I was really impressed by Admiral Gallaudet's comment back saying you are innovative, you are doing this stuff, and I really do think so.

I kid with my staff, I say when I come out of these meetings my IQ is higher because there's so many incredibly intelligent people but it goes down pretty quickly unfortunately.

But I think that I am truly impressed by the caliber of your staff and innovative approaches and whatever that NOAA does, but I also realize sometimes your hands are ties because you've got to go to Congress and other processes.

I don't have that, I can be very reckless and I can take chances. It didn't work out, fine. I always tell people 80 percent B that's good because I graduated with a C so we're doing better.

So I not only expect it but Congress is less tolerant, if you will, and so we have a different niche but I am truly impressed by your staff and the creativity and I just get more and more impressed.

And I was having a discussion with Mike Emerson the other night over a couple of beers and he was saying the same thing, that NOAA, what a phenomenal organization and the more he learns about it, like myself, the more he loves it and the more impressed by it.

And so kudos to you, Admiral, and your staff, and the panel that contributes so much time.

And so my goal was to really entertain you a little bit, give you a good facility, make you feel -- because it's really more about appreciating what you all do and so that's why I kind of rolled out the red carpet, if you will, more or less.

We got some rain but thank you, sir.

MEMBER THOMAS: And actually, I think, too, Juliana and Rich, we should all say thanks for all three of them because sitting through our discussions has to be painful.

MEMBER THOMPSON: Do we need to take any action on the charter? Do we need to do anything? So I'll make a motion that we accept it as is with minor changes by the legal counsel.

VICE CHAIR SAADE: Everybody in favor?

(Chorus of aye.)

VICE CHAIR SAADE: Motion passed. And I'll say one more thing, thank you all for nominating me to this position.

It's really a privilege and an honor and I'm looking forward to working with you all for the next meeting or two or however long this thing lasts.

But there's been a really good standard set by Joyce and others and I'm really looking forward to following in those footsteps.

CHAIR MILLER: You have to shrink your feet.

VICE CHAIR SAADE: Do I get to gavel it? Meeting adjourned.

(Whereupon, the above‑entitled matter went off the record at 3:55 p.m.)