U.S. DEPARTMENT OF COMMERCE

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NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

HYDROGRAPHIC SERVICES REVIEW PANEL

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VIRTUAL PUBLIC MEETING

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TUESDAY
APRIL 28, 2020

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The Hydrographic Services Review Panel met via webinar at 1:00 p.m., Ed Saade, Chair, presiding.

HSRP MEMBERS PRESENT

EDWARD J. SAADE, HSRP Chair
JULIE THOMAS, HSRP Co-Chair
QASSIM ABDULLAH, Ph.D.
CAPTAIN ANUJ CHOPRA
SEAN M. DUFFY, SR.
NICOLE ELKO, Ph.D.
LINDSAY GEE
DEANNE HARGRAVE
EDWARD J. KELLY, Ph.D.
CAPTAIN ANN KINNER
DAVID MAUNE, Ph.D.
CAPTAIN ANNE MCINTYRE

CAPTAIN (ret. USCG) ED PAGE

GARY THOMPSON

NON-VOTING HSRP MEMBERS

ANDY ARMSTRONG, Co-Director, UNH-Joint Hydrographic Center, University of New Hampshire
JULIANA BLACKWELL, Director, National Geodetic Survey, NOS
RICH EDWING, Director, Center for Operational Oceanographic Products and Services, NOS
LARRY MAYER, Ph.D., Center for Coastal and Ocean Mapping and Co-Director, UNH-Joint Hydrographic Center, University of New Hampshire

NOAA LEADERSHIP PRESENT

NEIL JACOBS, Ph.D., Assistant Secretary of Commerce for Environmental Observation and Prediction, performing the duties of Under Secretary of Commerce for Oceans and Atmosphere
REAR ADMIRAL TIM GALLAUDET, Ph.D. (ret. USN), Assistant Secretary of Commerce for Oceans and Atmosphere and Deputy NOAA Administrator
NICOLE LEBOEUF, Acting Assistant Administrator, NOS
REAR ADMIRAL SHEP SMITH, HSRP Designated Federal Official; Director, Office of Coast Survey, NOS

NOAA STAFF PRESENT

VIRGINIA DENTLER, Center for Operational Oceanographic Products and Services
LYNNE MERSFELDER-LEWIS, HSRP Coordinator
AMANDA PHELPS, Office of Coast Survey
GALEN SCOTT, National Geodetic Survey
JILL STODDARD, Office of Coast Survey

C-O-N-T-E-N-T-S

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

(1:02 p.m.)

RDML SMITH: All right. Well, I have top of the hour and I see quite a few attendees already online. I see I have 193 attendees plus the 29 of us that are involved in hosting and participating in this.

So, welcome to everyone. I have a few opening comments. I'm Rear Admiral Shep Smith and I'm the HSRP Designated Federal Official and the Director of the Office of Coast Survey.

The Chairman of the HSRP, Ed. Saade; Co-Chair, Julie Thomas; NOAA Administrator, Dr. Neil Jacobs; Assistant Administrator for the Ocean Service, Nicole LeBouef; NGS Director, Juliana Blackwell; CO-OPS Director, Rich Edwing; UHG-Joint Hydrographic Center Co-Directors, Dr. Larry Mayer and Captain Andy Armstrong; HSRP Members, colleagues and stakeholders, thank you for joining us for a condensed three-hour virtual public meeting due to COVID-19.

I understand that Admiral Gallaudet

may also be joining us. He's been very supportive and attended nearly every HSRP meeting for the last few years.

I would also like to extend a special welcome to our new members, Dr. Nicole Elko and Dr. Qassim Abdullah, and four reappointed members, Lindsay Gee, Captain Anne McIntyre, Gary Thompson and our chair, Ed Saade.

On behalf of NOAA, we're thrilled to have your expertise and thank you for your service to NOAA and the nation.

In these difficult times our thoughts are with the first responders and the incredible toll that the world is enduring in all areas and especially those in healthcare.

As we work down the chain, the impact -- of hydrographic and navigation services there are severe impacts related to our partners in shipping on trade, cruise ship industry and the overall maritime economy.

Many NOS and NOAA operations have been affected, including an operational pause in some

field work and others you will hear about later this afternoon. The health, cultural and economic repercussions of this crisis will be felt for decades ahead.

With all the stresses of this unsettled time, I asked Nicole, Ed, Julie and the panel to also help us recognize some good and welfare during the meeting where possible. This is the third virtual public meeting the HSRP has held and Ed and I intend to make this as convenient and productive as possible to fulfill the HSRP requirement for two public meetings a year.

We started out with a pretty low expectation for this meeting, but as we grew more comfortable with virtual tools we continued to raise the bar. And I'm actually pretty excited about the lineup of talks and discussions that we have today.

We're really pleased with the high turnout for the meeting today. As I scanned the names as they were arriving I saw many familiar

names from our commercial partners, from other U.S. federal agencies, from others in industry and even a few from overseas, from our sister hydrographic offices overseas.

We're working on, for later this year we're working on and look forward to our next in-person meeting which is rescheduled for September 22nd to 24th, 2020 in Oahu where we will pick up more or less the same agenda that we had to table from -- for this meeting.

So, please save the date and join us. I need to -- a couple of pieces of bookkeeping before we turn the meeting over to our chair. This is a public meeting and the webinar proceedings are being recorded, transcribed and posted to the NOAA HSRP website as part of the public record.

Your permission is required for use of audio and photos as it will be retained and disseminated on the meeting website and accessible as a public document.

By joining this meeting your likeness

may be subject to being recorded, filmed and these files stored on a government website in perpetuity. You can decline by abstaining from speaking or dropping off the webinar.

As a reminder to our HSRP members, during your service to the HSRP and for the two public meetings a year I want to remind you that you are serving as a NOAA employee, as a federal employee in your personal capacity as a subject matter expert.

Please remember to take off your regular work hat and replace it with your NOAA hat as you provide questions, comments and guidance to NOAA and to the administrator. Thank you for your service to strengthening NOAA's Hydrographic and Navigation Services portfolio.

While normally we would do introductions to NOAA staff at this time, due to the condensed nature of the call we'll include the list of participants in the summary report for the meeting and those of you online can browse the participants on your own.

NOS has a variety of staff who provide subject matter expertise and administrative support. There are approximately 20 NOAA staff who follow the work of the HSRP and already serve as a reference for you and can assist you with expertise throughout the year.

The goal of the meeting is to: discuss the current state of NOS Navigation Services portfolio of projects; provide key updates on ocean mapping, such as the NOAA response to the Presidential Memorandum on mapping the EEZ and nearshore and coastal Alaska; and to discuss with HSRP members on these and other subjects, their issue papers and recommendations.

The HSRP has an issue paper on emergency response and one on artificial intelligence to discuss. The directors will share some notes on the operational impact of COVID-19 and other topics of interest within the programs.

In regard to conserving time, all the speaker bios are in the advanced materials on the

web. So, we'll dispense with reading the speaker bios.

We'll have four-minute, two-minute and one-minute reminders to presenters to keep the presentations and meetings on time. And with that preface, I'd like to turn the meeting over to Ed Saade, our HSRP Chair. Over to you, Ed.

CHAIR SAADE: Thank you, Shep. Thanks everyone for joining us. I hope you can hear me okay. We've had a little bit of challenge on my particular connection.

I serve as HSRP Chair and President of Fugro. Nicole LeBoeuf, Dr. Neil Jacobs and Rear Admiral Gallaudet, the HSRP members, staff, and stakeholders, thank you all for joining us.

We really appreciate all the folks that are dialing in and taking time to participate. We are all operating in new territory, obviously, but we've all had about six, maybe seven weeks of practice as well with dealing with COVID-19 and we're getting a little bit more comfortable and certainly a lot more

engaged during these calls and these types of interactions.

So, this impacts us both personally and professionally. But all these types of meetings are really robust and engaged, the panel members really contribute an incredible amount of information and ask good questions.

And I think everybody presenting should expect that again today. And again, thank you all that are going to be presenting. I'll just do a little short reminder that everything is going to be squeezed a little bit. So, be cognizant of the time and we'll do our best not to step on each other too much.

I want to recognize the following panel members. Julie Thomas serves as the co-chair. There are three working groups with five chairs and that's Dave Maune and Julie is the chair on the Planning and Engagement Working Group. Ed Page chairs the Arctic Working Group.

Deanne Hargrave and Lindsay Gee chair the Tech Working Group. As Shep said, all bios

are in the web materials and thank you for your leadership and also thank you all for the contribution you've been making.

Dr. Jacobs and Nicole LeBoeuf, I look forward to the next in-person meeting and the positive work we will be doing together. And if it all works out that will be in Hawaii hopefully in September.

I look at the ease with which that is able to happen in person. And as Shep referenced, there's lots of opportunities to interact and go to breaks and in the evening and an incredible amount of work and information gets passed. That will be sorely missed. But we will do our very best to keep the energy going.

In the meantime, the HSRP will discuss and hope to provide you with an issue paper with recommendations as part of the outcome of this meeting. Gary Thompson will lead us on the discussion of a draft issue paper on emergency response and artificial intelligence.

And as always, various topics will

probably come up and we'll be sure to capture those and forward them to you relative the position of HSRP and its regulation.

To the stakeholders, staff, and others joining the webinar, we encourage your public comment and input on the topics of the navigation services.

We've found over the years that whatever city that we will be in or whatever portion or part of the country that we're in, it has proven to be a very good outlet for the local interests.

We're hoping to be in Hawaii later in the year so we don't miss that opportunity. (Audio interference) across the nation. So, all the input from all different parts of the country and all different cities ought to be (audio interference) in terms of the breadth of comments that come in.

Comments will be read into the public record during the public comment period at 3:15 this afternoon as well as projected onto the

screen if received in time to make it into a slide.

I encourage you to please send in your comments now via email as noted on the HSRP website and in the meeting Federal Register Notice, or you can use the chat function of the webinar.

So, now on to intros. So, the introductions for the various HSRP members and leadership. While member bios are in the advance materials on the web, we'll dispense with reading speaker bios at this time in the interest of time.

Could you please provide your -- could you each provide your name, geographical location, organization, job title and area of expertise?

And if possible, provide one of the following: an area you want to see the HSRP or NOAA address, an item of good and welfare, or another comment of your choosing.

We'll do those in alphabetical order

starting with the voting members. I'll start the process and we'll then move to Qassim Abdullah, Dr. Qassim Abdullah next.

So, for myself my name is Ed Saade. I'm the President of Fugro USA and field director for all of the Americas for Fugro. We've been a contractor with NOAA going back to the mid-1990s.

We conduct various hydrographic surveys, all types of mapping of the sea floor and the interaction with NOAA in the various labs has been extremely beneficial and educational.

As far as any particular topic, I just encourage us all to keep looking for synergies between industry and NOAA and sharing ideas and discoveries between industry and NOAA. Dr. Abdullah, would you go next, please?

MEMBER ABDULLAH: Hello, everyone. My name is Qassim Abdullah and I'm Chief Scientist with Woolpert. And I also am an adjunct professor for Penn State and University of Maryland Baltimore County.

My intros, I'm a civil engineer and my

background and my degree is in photogrammetry and surveying. I'm involved with the industry for the last 40 years focusing on mapping to standards and accuracy, especially with the ASPRS standard.

I'm looking forward to serve on the Board for the HSRP. I would like to focus, I'm involved a lot lately with the Smart Cities, Smart ITS, Intelligent Transportation System.

So, I would like just to bring this to the, to NOAA activity for Smart Navigation, Smart Board. There's a lot of good concepts, I think we can definitely adopt for our waterways' navigations.

On the welfare, like everybody else involved with the situation COVID and I'm proud of the, I did the QC on my wife's mask she made for the first responders. We donated it to the local hospital.

She sat me down to have the scissors and snip the thread, and if she missed a seam. So I spend a lot of my time with her on doing that.

And I'm looking forward for the meeting and the outcome of the meeting. Thank you.

CHAIR SAADE: Thank you, Dr. Abdullah.

MEMBER ABDULLAH: Thanks.

CHAIR SAADE: Next is Captain Anuj Chopra.

MEMBER CHOPRA: Hi, good afternoon. This is Captain Anuj Chopra. I'm Vice President Americas for RightShip.

We are -- you can hear some thunder in the background. So, we're getting some rain in Houston.

But our focus is really maritime and environmental risk and securing the maritime supply chain for different providers for gas, LPG, LNG, chemicals, crude oil and also dry cargos.

Personally I'm very actively involved with seafarers' welfare with education of the maritime supply chain and especially seafarers' welfare now. And they're having a tough time trying to change crews where ships are still on

the high oceans and making sure that we get our supplies.

I'm intimately involved with big data and with subject matter experts and trying to support the HSRP and the leadership team the best I can. Thank you so much.

CHAIR SAADE: Thank you. Mr. Sean Duffy, please.

MEMBER DUFFY: Yes. Thank you, Ed. So, Sean Duffy, Executive Director of the Big River Coalition and Executive Vice President of the Louisiana Maritime Association.

I represent navigation on the Mighty Mississippi. I really appreciate the engagement with the HSRP, I find that sometimes we have common problems and occasionally they have common solutions.

So, as we work to adapt and incorporate some of the things that are very important to us, we've seen information from NOAA's National Center for Excellence on increased precipitation. We've opened the Bonnet

Carre Spillway again this year, twice last year and in 2018.

So, we're seeing the system change and be tested. Some of the things that may not come to mind when you think of increased precipitation is higher rivers, so air gap sensors on bridges and surveys of shoaling in the lower river become really important. And as we look to expand NOAA's PORTS program and bring in the new frontier with precision navigation, appreciate everybody's time and it's good to have a group of experts to bounce ideas off. Thank you.

CHAIR SAADE: Thanks, Sean. Next is new member Dr. Nicole Elko. Welcome, Dr. Elko.

MEMBER ELKO: Hi, thank you. I'm honored to be here. You can hear me? Yes.

CHAIR SAADE: Yes, loud and clear.

MEMBER ELKO: Okay. So, as you can see by my -- all of the words and italics under my name on that slide I represent a couple of different organizations.

But essentially I'm bringing the local

coastal community stakeholder perspective. So, I work as the science director at the American Shore & Beach Preservation Association, which is a national organization, most of our members being kind of those local communities dealing with coastal management issues, beach erosion and nowadays more often nuisance flooding.

I'm also the executive director at the state level of the South Carolina Beach Advocates. That's a state organization here in South Carolina, I'm based on Folly Beach in South Carolina.

And that organization has a board of directors of all of the mayors of each of the beach communities from North Myrtle Beach down to Hilton Head. So, comprehensive statewide perspective there.

Then finally, I have my own business, Elko Coastal Consulting. My clients are these local communities. For example, this morning I was out on Folly Beach doing some topographic and hydrographic survey work for them.

So, I'm really looking forward to working with you all. I am not sure exactly what I want HSRP or NOAA to consider at this point. So, I'm going to focus on learning from you.

But again, I'm really interested in sharing these perspectives, coastal community resilience and some of these topics that these communities are really struggling with right now in terms of not really having data, hydrographic type data to understand the flooding and these challenges that are coming their way. Thank you.

CHAIR SAADE: Thank you, Nicole. Next up is Lindsay Gee -- sorry, Deanna Hargrave. Sorry, Deanna.

MEMBER HARGRAVE: That's okay. Thanks, Ed. So, Deanna Hargrave. I'm the Geoscience Manager for Atlantic Shores Offshore Wind, an exciting 2.5 megawatt project off the coast of New Jersey.

We're very excited that in spite of COVID we've partnered with Fugro and yesterday started operations. And so, we had to take into

account a number of special measures with respect to COVID.

And some of those things are with respect to how do personnel transfer to a vessel which is a confined area that's COVID-free and not introduce the virus to the crew. And so, we took a risk approach to looking at ways to come up with creative solutions for transferring personnel to the vessel.

In addition to that there's a number of monitoring measures that have been put in place, you know, measuring their temperature and self-isolating for 14 days prior to joining the crew.

So, we are happy to announce that we've successfully started the program and are very excited to, you know, contribute to the blue economy, renewable energy and progress in climate change. So, thanks.

CHAIR SAADE: Great. Lindsay Gee.

MEMBER GEE: Thanks, Ed. My name is Lindsay Gee. I'm the manager of Mapping and

Science Operations of the Ocean Exploration Trust and the operations of exploration vessel, Nautilus. It's on the West Coast.

I'm based up in New Hampshire and I wish I wasn't right now because actually to wear a short sleeve shirt I have to turn the heat up. So, I would rather this meeting was in Hawaii. But that's okay for now, we're virtually online.

And I would also like to say that I am really looking forward to meeting the new members and those that I haven't had a chance to meet up with yet.

Yes, I think we're all challenged by current situation. Our ship, Nautilus is down in Mexico just finishing a dry docking and our exhibition season is starting in July, hopefully.

So, we're interested in doing the same things trying to make sure we can push that forward. We work with another area of NOAA, the Ocean Exploration and Research for our major grant.

And so, it's pleasing. And I think,

I'm not sure because I'm involved in ocean exploration but I'm kind of positive when I see over the last few years a really increased focus in the oceans and that goes from the UN kind of Decade of Ocean Science for Sustainable Development, the Seabed 2030 Mapping Initiative.

And now obviously we're going to discuss, I think, the Presidential Memo on ocean mapping and in the EEZ and the shoreline of nearshore Alaska.

And I'm keen to provide input and see what NOS has in plans for their contributions in particular with transportation and the aspects of the blue economy. So, I look forward to those discussions. Thank you.

CHAIR SAADE: Thanks, Lindsay. Ed Kelly, you're up next.

MEMBER KELLY: Hey, Ed Kelly here. I'm the executive director of the Maritime Association of the Port of New York and New Jersey.

Obviously, that puts me up in the

representation for the Northeast. And my area of expertise is for deep sea port operations and also estuary operations, ferries, tugs, et cetera.

My interest in this panel is to assist NOAA in looking toward new ways to develop data and products that will lead toward waterway asset maximization, certainly the precision navigation projects, coastal mapping, modeling, weather advanced noticing is all very important to us.

And we trust that the proper development of those, that data and the products that result from them will help to lead us toward a safer, cleaner and a more secure waterway environment in which we can conduct business. Thanks.

On a personal basis I would just like to put out a shout out to all of our professional mariners and industrial maritime operators, longshoremen, tug crews, et cetera that are on the front line out there of keeping our supply chain moving.

CHAIR SAADE: Thanks, Ed. Next up is Captain Ann Kinner. Ann, you're muted.

MEMBER KINNER: I am now unmuted, I hope. Ann Kinner, Captain Ann Kinner, owner of Seabreeze Books and Charts in San Diego and Chair of the San Diego Harbor Safety Committee.

Longtime experience with small boats, recreational boats, small working boats, pretty much anybody in the maritime community but definitely focused on the small boat fleet. My particular interest as you can tell from behind me is paper charts, charting of any kind.

I've been dealing with paper charts for 25 years now, I think. It's still an important part of a navigator's tool kit. And in spite of the fact that electronic seems to be taking over everything in the world, when the power goes down they aren't there.

And I'm particularly concerned with the transition in the way that paper charts are going to be produced in the future. Like we had in 2014, there is a lot of confusion out there

right now among the small fleet.

And a lot of people keep saying I've got to buy my charts now because there won't be any anymore. And that's just not the case.

And so, I'm spending a lot of time explaining to them what the real transition is and how going into this ENC-based database will save time and money and probably give them more accurate charts in the future.

But it's a communication issue and unfortunately people don't always read all the words in the paragraph. So, that's part of my focus.

I'm doing my best and hoping that we can keep it clean and clear to the folks out there so I don't have to spend quite so much time explaining it and I can spend more time getting them the right charts that they need. Thank you.

CHAIR SAADE: Thank you. Next up is Dave Maune.

MEMBER MAUNE: Good afternoon. I'm Dave Maune from Dewberry Engineers. We're

headquartered in Fairfax, Virginia.

I'm a geodesist and a photogrammetrist who specializes in elevation mapping of topographic and bathymetric surfaces. I have published three books on digital elevation models from photogrammetry, radar, sonar, topographic and bathymetric lidar.

Having just completed our ten-year IFSAR statewide mapping of Alaska, I'm now working on NOAA's 3D Nation Elevation Requirements and Benefits Study documenting requirements for and benefits from seamless topo and bathymetric mapping from the tops of the mountains to the depths of the seas.

As you know from a draft issue paper that I presented in -- at our last HSRP meeting I'm interested in the Alaska coastal mapping strategy for shoreline and nearshore mapping of Alaska being prepared in coordination with the Presidential Memorandum that we're going to be talking about today and the HSRP's response to this strategy.

CHAIR SAADE: Thanks, Dave. Next up we've got Captain Anne McIntyre.

MS. STODDARD: Hey Anne, it appears that you have yourself muted.

CHAIR SAADE: No, you're still muted, Anne.

MS. MERSFELDER-LEWIS: Hi, Anne. Could you go -- this is Lynne. Could you go into your audio button on your menu and go down and look at what your audio says, and it may say self-muting.

If you're using computer audio make sure that's noted and if you're, make sure your speakers are on if you're not hearing us. Hey, why don't we come back to you because we are still not getting you.

So, we'll go to the next person and then we'll come back to her towards the end. But we'll work on that in the background.

CHAIR SAADE: Okay. Next up is Captain Ed Page.

MEMBER PAGE: Hi. I'm calling from --

despite the Hawaiian shirt I'm calling from Juneau, Alaska where I serve as the executive director of the Marine Exchange of Alaska which I started some 30 years ago -- 20 years ago after spending 30 years with the Coast Guard.

Had tours on the East Coast and the West Coast and first came to Alaska in the early 70s and became enamored with Alaska. But I had prior assignments as Captain of Port of LA-Long Beach, chief of marine safety and environmental protection for West Coast out of San Francisco area.

And several tours up in Alaska. I've got a total of 30 years in Alaska. So, when it comes down to social distancing I know how to do that.

I've done that for many, many years now kayaking, whatever in Alaska and hiking and skiing. So, social distancing is nothing new for me.

The Marine Exchange is a non-profit that provides, organization in Juneau that

provides information and communication services to help safe, secure, efficient, environmentally responsible maritime operations.

There are about 20 staff. We've built 130 Automatic Identification Systems throughout Alaska and north of the Aleutian Islands, many of which transmit information as well as receive information on ships.

Built some 55 weather stations. We're into brokering information to aid safe maritime operations.

And there's a clear nexus to what NOAA has been doing. My time with NOAA starts back in the early 70s when I was on the East Coast and the NOAA weather people would sail with us. And so I've been engaged many, many years with NOAA.

I have served several years as the Chairman of the Alaska Ocean Observing System. And so, I find that being on the HSRP I'm more of a maritime generalist.

My focus has been in marine safety and environmental protection, having worked several

SAR cases over the years that didn't go well because of lack of information and people staying in harm's way not realizing they're heading into heavy weather.

Also the Exxon Valdez spill, I worked that for three years as operations and became an advocate of protecting the environment after realizing how much havoc a major oil spill can cause.

So, I see the things that I've been involved with some 50 years in my maritime field have been very closely paralleled with what NOAA is doing. So, I'm pleased to have some position to help NOAA kind of work through some of these other issues in the future.

So, I think that my focus is obviously Alaska because I've got 30 years up here. And kind of taming the Wild West or opening up this new maritime frontier in the Arctic and doing it right.

We're not going to do it the same way in the lower 48. We don't have the resources.

We're not going to build lighthouses or what have you.

It's going to be using technology and NOAA's been doing a fair amount, quite a bit of efforts as far as surveying and through traffic lanes and safe waters, et cetera. So, when this opens more and more we can take advantage of that.

And the only question I have of NOAA, I guess, is how did Admiral Smith end up in Hawaii after all? I see the Hawaiian background behind him and the rest of us are stuck in our respective homes.

He still got a ticket to go to Hawaii. So, good on you there, Admiral. I'm impressed.

And other than that, I think that, you know, I think the challenges for NOAA and which you're doing great, by the way, is really leveraging technology to get more information to the maritime community and the community at large, all of, you know, the residents of the U.S. when you think of the National Weather

Service, whatever.

Getting more information and better dissemination of information. Any way I can help to that end and kind of leverage technology to be more effective that way results in saving lives, protecting the property, aiding the blue economy and a lot of good things.

So, that's my story and I'm sticking to it.

CHAIR SAADE: Thanks, Ed. Julie Thomas, please.

CO-CHAIR THOMAS: Thank you. I'm Julie Thomas, co-chair of the HSRP, as was mentioned. And so, I would just like to welcome the panel and a big thanks to the organizers.

I've been with Scripps Institution of Oceanography in La Jolla, California. I headed two programs there, both involved with producing oceanographic products.

And, you know, it's just been a real honor to be a member of the HSRP and to have a window into NOS' navigation services portfolio.

These are really critical and relevant components of maritime operations.

And they're -- these topics are really of interest to me, subjects that I've dedicated my career to. So, it's been a real pleasure getting to know a little bit more about the inside aspect of it. Thank you.

CHAIR SAADE: Thanks, Julie. Gary Thompson, please.

MEMBER THOMPSON: Good afternoon, everyone. My name is Gary Thompson. I'm the chief of the North Carolina Geodetic Survey.

And I'm also the Deputy Risk Management Chief here at North Carolina Emergency Management where we have our Floodplain Mapping Program and our Flood Warning System.

My area, I'm also a professional land surveyor. My area of expertise is geodetic surveys and I'm pretty involved in our two iterations of lidar data collection here in North Carolina.

And we're coming up on our third

iteration this year of collecting lidar data in North Carolina. My area of interest, I would like to see the panel in artificial intelligence.

I think it could be utilized to help us with disaster response. And so that's, we'll be talking about it later today in my paper. So, thanks.

CHAIR SAADE: Thanks, Gary. Okay, we'll keep moving along here. I would like to have the four non-voting members of the HSRP and the NOS and NOAA leadership do self-intros in alphabetical order.

And we'll jump right into that. It saves a little bit of time. Captain Andy Armstrong, please.

CAPT ARMSTRONG: Hello, everybody. I'm Andy Armstrong. I'm the NOAA Co-Director of the Joint Hydrographic Center. I'm an Office of Coast Survey employee and work at the University of New Hampshire in Durham, New Hampshire.

I'm a hydrographer and a retired NOAA Corps Officer. I'm in my fiftieth year of

government service, four of those years in the Navy and 46 in NOAA.

And it's been my privilege to be part of HSRP as a non-voting member since the beginning. So, thank you.

CHAIR SAADE: Thanks, Andy. Juliana.

MS. BLACKWELL: Greetings, everyone. I'm Juliana Blackwell. I'm the Director of NOAA's National Geodetic Survey.

And I'm joining you from Virginia today. I'm headquartered in Silver Spring, Maryland with NOAA.

And one of the things that I enjoy hearing from the panel and look forward to hearing more about are innovative solutions for us for our mission challenges with respect to things like partnerships and technology and outreach and education, things that you all bring to the table from your perspectives, from your organizations.

So, I look forward to hearing more about those things today and in the future.

Thank you.

CHAIR SAADE: Thank you, Juliana. Rich Edwing. Rich, you might be muted.

MS. STODDARD: I believe Rich is self-muted.

MR. EDWING: Okay. You should hear me now.

CHAIR SAADE: Thanks, Rich.

MR. EDWING: Okay. Good afternoon, everyone. I'm Richard Edwing. I'm the Director of the Center for Operational Oceanographic Products and Services.

I'm here in Maryland, not in Silver Spring, but just outside of Silver Spring. We're also called the Tides and Currents folks, for those of you who aren't familiar with us.

And I always look forward to these meetings because I look to the HSRP a little similarly to what Juliana said, you know, where is the country going, where is the industry going, what's coming over the horizon that we need to be paying attention to and getting

prepared for.

So, we always learn a lot from them. And I have 43 years of service. So, I'm just a mere child compared to Andy, apparently. Thank you.

CHAIR SAADE: Thank you. Dr. Neil Jacobs, thank you for joining us. Please go ahead.

DR. JACOBS: Sure, thanks for having me. I'll get into a little bit more details in some of my personal background when I provide remarks here in a little while. But I'm the acting head of NOAA.

Probably known as the dry side guy. But I think you'll be surprised to know how much wet side experience I have.

CHAIR SAADE: Thank you. Nicole LeBoeuf.

MS. LEBOEUF: Hi, good day, everyone. This is Nicole LeBoeuf. I'm the Acting Assistant Administrator of the National Ocean Service coming to you from my home office in Kensington,

Maryland.

I'm looking forward very much to a time when we can all be together again. But I want to thank everyone for all they're doing to make today's meeting run as seamless as possible.

I'm keenly interested not only in the input of the HSRP but specifically around where NOS' offices and programs can work more closely together or more integrated or in a more innovative fashion to provide our services and tools even better as we have to deal with a rapidly changing coastal zone.

And lastly I will just say that, you know, I hear a lot about this virus that came potentially from China. But I am amazed at what Sean Duffy, the lengths that Sean Duffy will go to, to be able to claim that he had the last best HSRP party.

That's what I have to say about that. And more soon, thanks.

CHAIR SAADE: Well noted. And, Dr. Larry Mayer.

DR. MAYER: Hello, all. I'm Larry Mayer. I'm a professor at the University of New Hampshire. Sitting here in New Hampshire, it is cold.

But unlike Lindsay I'm too cheap to turn the heat up so I've got my long underwear on underneath the Hawaiian shirt. I'm a geologist geophysicist by training focused these days on all aspects of ocean mapping.

And as I think about this meeting I think about the fact that much of our profession has been fortunate in that we can carry on our theoretical and our analytical work. But as Admiral Smith pointed out it's really, it's that field program aspect that really has taken a huge hit.

And that makes me think about how valuable the concept of autonomous vehicles could be. We could have a fleet of autonomous vehicles out there now still collecting data.

And so, I'm very pleased that the HSRP has looked into that and will look into that.

And I hope it stays a hot topic. Thank you.

CHAIR SAADE: Thanks, Larry. We're going to try Captain Anne McIntyre one more time. Go ahead, Anne. Still muted, Anne, sorry. We'll catch you today later on. Thank you.

Okay, we'll move on. Next up is --

MS. MERSFELDER-LEWIS: Hey, Ed. Try Anne again right now. She was muted by us and we've unmuted her. Anne, if you would --

CHAIR SAADE: Okay. Go ahead, Anne. Go ahead, Anne.

MS. MERSFELDER-LEWIS: I'm sorry. Your mic must not be on, Anne.

CHAIR SAADE: We'll get you. Okay, next up is some remarks from our guests. So, Nicole, if you will go ahead and start we're ready when you are. Thanks.

MS. LEBOEUF: Yes, thank you, Ed and Admiral Smith. Dr. Jacobs, welcome to your first Hydrographic Services Review Panel or HSRP as you've heard already.

Congratulations to our new HSRP

members and our four reappointed members. We are thrilled to have your expertise whether for the first time or another four years, whichever the case.

Welcome, everyone. Sorry we're not in Hawaii despite our excellent Hawaiian garb. But no matter where we are today it's great to be with you.

I hope everyone can see and hear the webinar and you're comfortable and safe in your homes. Whether or not this meeting is virtual, I predict it's going to be a good, productive meeting.

The NOS team has done an amazing job of preparing today and I want to thank them all right off the bat. And Dr. Jacobs, I'm delighted you're getting an introduction to the HSRP under any circumstances.

As I said at our pre-brief, this federal advisory panel is top-notch, highly engaged and invested in NOAA's success. And they are a fun crowd as well, I can tell you that.

To the HSRP, on behalf of NOAA and NOS let me say that we sincerely appreciate your advice and recommendations and we are looking forward to public comment from the audience. These unprecedented times present unprecedented challenges.

But I believe they also offer opportunities to reexamine how and where we work, as some of you have already alluded to. And it forces us to prioritize our health and well-being and that of our loved ones and I welcome that.

At NOS we will not waiver from our robust partnerships with everyone around this table and others not here today. And I can tell you that NOS' collaborative spirit is stronger than ever.

I have no doubt that together we will emerge from these strange times even stronger than when we came into them. At NOS and across NOAA, I am pleased to report that we are proving ourselves adaptive, innovative and resilient as we press forward with mission-essential

functions.

Using telework and virtual meetings NOS and other NOAA employees are doing an amazing job of demonstrating their commitment to the American people. And of course, there will be some ongoing impacts, as was noted, especially in the field work and vessel and aircraft operations. But we're doing what we can to work through them while keeping the health and safety of our workforce our top priority.

As you all are aware, COVID-19 is a challenge to our nation in many varied ways. Even the maritime industry has had significant impacts.

Essential shipments are being delivered. But the cruise industry has been seriously impacted and may feel the effects of the pandemic for some time.

Thus far, we have had no mission-related emergencies requiring us to mobilize significant resources at NOS. But we are fully aware that hurricane season is approaching, and

we are taking steps to ensure that we are prepared to respond as needed. We will remain public servants and if we need to deploy, we will.

Being a leader during these times has been a definite challenge for me. I spend a fair bit of time trying to figure out how best to serve the people of NOS, all 1,800 of them, that were in 50 facilities across the United States but now they're in countless homes across our country.

I have focused my efforts on communicating clear expectations for every NOS employee. And I'm going to give you a rundown of the top four of those.

Number one, my expectation through this is that their health and safety and that of their loved ones comes first. Number two is that they are gentle on themselves and patient for not getting all of their decision-making right the first time.

Number three is to acknowledge that

some things at work will slip because there are many people balancing educating their kids, taking care of parents and much else right now.

And lastly, I am saying to them that we're in this until we're not. And so, resilience and stamina are the name of the game. I'm pushing these messages out as often as I can and I'm getting very positive responses from the organization at every level.

And while I'm not the boss of you, these principles hold true for all of you as well. Be kind to yourselves as we go through this as a nation.

And before I tee up for the rest of the day I want to echo something Admiral Shep said at the start. I'd like to take a moment to say that NOAA and NOS appreciate the tireless efforts of the men and women who have put others and country first, including front line workers, healthcare professionals, doctors and nurses.

That said, I want to acknowledge a fallacy in that statement. The work of those on

the front lines in the medical healthcare professionals, first responders and anyone faced with putting themselves in harm's way to care for others, their work is not tireless.

Their work is exhausting. In some cases it's traumatic and it's dangerous. And yet they go to work in emergency rooms, in clinics, to the nursing homes and police stations all to ensure the health and safety of the rest of us.

They put themselves and their loved ones at risk and I salute their professionalism and bravery on a daily basis.

Okay. So, to the business of the HSRP, the navigation services programs that you advise continue to carry out the missions and there are some COVID-related impacts on our work due to necessary travel restrictions.

In addition, there will be delays and postponements for repair and maintenance of things like tide gauges and NGS CORS stations.

This afternoon you will hear from the directors of the navigation services portfolio at

NOS, including Juliana Blackwell from the National Geodetic Survey, with a status on the NGS' coastal mapping activities as well as the National Spatial Reference System modernization efforts.

You'll hear from Rich Edwing of CO-OPS who will talk about their plans for the expansion of PORTS. Admiral Shep Smith from the Office of Coast Survey will cover the progress report on unmapped waters, the new OCS strategic plan, the rescheming of electronic navigational charts and the five-year plan for sunsetting of traditional NOAA paper charts.

All directors will talk more with you about any COVID-19 related program impacts that they're having.

And then after, I will be back at the mic with Shep at 1:45 -- it's already 1:50 -- to share some news on the progress we've made implementing the November 19 Presidential Memorandum on ocean mapping that he mentioned before.

Before I sign off, I want to give you some quick budget updates. As you may know, Congress enacted our FY20 appropriation for NOS at its highest level yet, $606 million.

The programs under the purview of the HSRP generally received level funding or modest increases over the previous years so that's a very good thing. And the President's FY21 proposed budget was released in February.

And that kicks off next year's appropriation process. However, given possible delays due to COVID-19, I would be surprised if we had an FY21 budget enacted before the election.

You may have heard about COVID supplemental funding. That's been mainly focused on individuals and businesses and not federal agencies.

That said, NOAA has received a small amount of supplemental funding related to IT and continuing operations remotely and via telework. There is some talk among Congress about recovery

funding to support infrastructure.

If Congress goes forward with a supplemental that supports U.S. infrastructure and jobs we are ready with ideas to put people to work.

The US Marine Transportation System information structure has plenty of areas that would benefit from job creation and economic investment, whether in precision navigation and activities like hydrographic surveys, shoreline mapping, geodetic modernization and water level network requirements.

And if there's been a silver lining related to COVID-19 in the maritime industry it's perhaps that this whole experiment has shown us how important the maritime industry is to the American people and to the U.S. economy for getting critical goods like food and PPE to stores and into the hands of those who need them most. In that regard, I'd like to echo Ed Kelly's comments expressing gratitude for those working on ships and on the docks to keep our supply

chains going.

And with that, I'd like to thank everyone who is here in attendance. I'm looking forward to the discussions this afternoon. Mahalo nui and thank you very much.

CHAIR SAADE: Thank you, Nicole. Great stuff, really appreciate it. We'll move on to Dr. Jacobs. It's your first time here joining us directly.

Looking forward to your statements and what you're going to present. Thank you. Go ahead, please.

DR. JACOBS: Well, thank you. It's great to be here. Good afternoon, everyone. I am excited that I'm not wearing a suit although I'm a little disappointed I'm not in Hawaii.

A big shout out to Nicole, Admiral Smith, Ed and the rest of the leadership and folks here. What you're doing is incredibly impressive.

Obviously, everyone has been aware of the COVID challenges that we've been faced with

at NOAA. I can't tell you how proud I am of the agency for just moving forward as if almost nothing happened.

Most everyone is teleworking. But we haven't really slowed down our mission. I'm really looking forward to getting back. I know that personally I'm looking at a new work-life balance.

I'm actually in my backyard right now because my kids are inside screaming so I may have to talk over some dogs and some birds. The message that I've been sort of pushing down through the agency is really to set expectations on productivity, particularly when you've got a lot of family and other issues to deal with at the same time.

It's just not realistic to expect to maintain that same level of productivity and setting goals too high and not achieving them is just frustrating. Other than that, it's mainly been focused on making sure everyone puts their family first and staying happy and healthy.

That's a top priority.

It is nice to see a couple familiar faces. This is my first, I guess, official HSRP but I did poke my head to the one in Miami.

A lot of you were at the PORTS dedication in 2018. Some other folks here I think I've crossed paths with in D.C.

I'm probably known as the weather modeler or the weather forecaster, but I grew up along the coast. Almost my entire life revolves around the ocean.

My two favorite hobbies are surfing and fishing. I got into surfing basically as a kid back in the early 80s.

And of course, if you want to know when the waves are going to be good, you have to understand how to forecast the weather, the tides. You have to understand bathymetry.

There's a lot of things that go into trying to figure out when the waves are going to be good. And of course, on the East Coast they're almost never good.

So, I ended up really spending a lot of time doing recreational fishing both inshore and offshore. I've spent a lot of time in the Charleston area and Outer Banks area working as a guide.

I grew up in Miami fishing both offshore and in the mangroves and the Everglades down there. And then before I finished high school moved to Charleston.

So, for Nicole Elko -- I realize there is more than one Nicole in this webinar here -- I actually grew up right at the end of James Island, last street on the left before you get to Folly.

I went to grad school at NC State. My Assistantship was actually funded under the DOE's Ocean Margins Program. I worked with Len Pietrafesa there in the early 90s looking at carbon cycle along the continental margin.

So, this was mostly southern mid-Atlantic bite between Cape Hatteras and the Chesapeake. We noticed a lot of strange behavior

with the Gulf Stream.

It was really, tends to do a lot of meandering once it gets off of North Carolina. And a lot of this has been traced back to a feature some of you are probably familiar with called the Charleston Bump.

It ends up deflecting a lot of the currents causing some of these meanders and eddies.

My interest at that point transitioned over to how it influenced weather forecasting because the sea surface temperature thermal gradient of the western boundary of the Gulf Stream, when it would move to the west and back up against the coast line there would be a tremendous thermal gradient which would really drive the heat fluxes and extratropical cyclogenesis.

So, that's what I ended up doing my PhD work on. I've also spent a fair amount of time on the Ron Brown and the Sagar Kenya during the INDOEX experiment.

My point in telling you this is so that you know that I've not only professionally benefitted from the work that everyone here has done, but I've also personally benefitted from it.

So, I just really want to make sure everyone knows how much your work matters, especially along with the work within NOAA. We've got OCS, CO-OPS, NGS. These are all critical to our blue economy and our nation.

We have a lot of programs that I'm sure you're aware of, some of them will be discussed later today. But these are all great examples of public-private partnerships.

This is obviously very critical data when it comes to emergency response, whether it's in situ or remotely sensed observations. There's a lot of different applications.

But I just wanted to give one that sort of came to mind. It was my last trip before COVID basically shut down all my travel.

I had gone down to Miami and I was met

with some folks at the Hurricane Center and then ended up going out fly fishing with Jamie Rhome who works at the Storm Surge unit there. And we were fishing a lot of these canals in South Florida that dump out into the ocean.

And right before you would get to the end of the canal he was explaining to me that there's these gates. And the challenge that they have when they're trying to forecast inland flooding versus storm surge is do you put the gates up or down, because if you leave them up the surge comes in.

But if you leave them down the flooding can't escape. And the concern was well, if you lose power you might lose the ability to move the gates up or down.

So, there's obviously a lot of challenges we have. One of the things that I've been trying to work with the agency on is really coupling our storm surge model capability with our inland flooding.

We saw this with Harvey. We saw it

again with Florence. When you have sustained onshore flow piling up the water while the storm is dumping rain measured in increments of feet and the water can't drain offshore because of the onshore flow, it creates a real flooding challenge.

Obviously we're going to be discussing the Presidential Memo. The only thing I wanted to mention on this is the fact that we have a Presidential Memo on ocean mapping should tell everyone what a high priority this is for the administration.

And the bottom line is we can't do this without your guidance. So, we're continuing to advance science and tech. We've got several artificial intelligence and machine learning initiatives.

We've got quite a few unmanned systems both underwater and in the air. Many of these applications have hydro and nav service activity and interest there.

But as we see that when we are faced

with this ability to collect a tremendous amount of data, we do want to be aware of a potential bottleneck in how we store and manage the data and manage the metadata.

So, we started out with a pilot project called The Big Data Project a few years ago. And this is something that we've been working with a lot of cloud service providers to store this data.

And there's a shared interest here. So, the private industry really wants access to a lot of this data and they want access to it as fast as they can get it. We as an agency would love to store more data. And of course, compute storage is not cheap.

But the interest in the private industry for acquisition to this data and processing of this data is incentivizing the cloud service providers to give us a very nice deal with storage because without the ability to store the data no one is going to have access to it.

Again, this is another great example of public-private partnerships. So thanks for all your recommendations, especially at the August meeting.

We are listening. Of particular interest, obviously PORTS. This is going to be really critical going forward especially when we start to spin the economy back up.

The National Spatial Reference System, precision nav, strengthening the Weather Service connections, not just with what I just mentioned with flooding and surge but just general forecasting.

There's a lot of work we're doing there, particularly engaging with other partners like USGS when it comes to elevation and stream gauges and things like that, the Army Corps of Engineers, the Coast Guard.

Anyway, I can't overstate how much value the work you do is providing not just us but the entire global community and the economy. So, thank you very much.

I'm going to be on the call for as long as I can. I do have a hard stop slightly after 4:00. Thanks.

CHAIR SAADE: Thank you, Dr. Jacobs. That's really great, really inspiring. Appreciate it. Before we move on, I also wanted to acknowledge that Admiral Gallaudet is listening and will at some point hopefully make some comments.

And now, I get to turn it back over to Shep Smith so he can get us back on schedule.

RDML SMITH: I'll do my best. I will skip over some of the reading of the words on the slides and leave that to everyone's very good reading abilities.

So, this first panel is on an ocean mapping moment of big ideas. This has been referenced a few times already with the Presidential Memorandum in the fall.

But also, tied into some global initiatives and some at the office level. So, I have a few slides. Are those going to come up?

All right. Next slide, please. So I think of all of these things as neatly nested, although they weren't done sequentially.

Really of all of these Seabed 2030 has been going the longest, followed shortly thereafter by a UN initiative on a decade of ocean science which incorporated the goals of Seabed 2030 into a broader set of ocean initiatives.

And then in the fall we had the Presidential Memorandum which will lead to an ocean mapping strategy for the United States. And the Office of Coast Survey, my office, has really already completed but we're waiting for the national strategy to be released so that we can release an office level plan that is well aligned with it.

Next slide, please. A big part of this is you can't do this enterprise of mapping the global oceans without a gigantic coalition.

This was recognized decades ago by the coastal -- and the creation of the interagency

Integrated Ocean and Coastal Mapping Program within NOAA and the commensurate, the Interagency Working Group on Ocean and Coastal Mapping which is the cross-agency group.

So, this was all laid down in law about 15 years ago. In a way that is still evolving, all of these buzz words on this slide are coming into alignment.

But one of the things that we really need to do to finish that alignment is to update the OCMIA which authorized the IOCM program. So, the Ocean Coastal Mapping Integration Act has not been authorized since, reauthorized since 2009.

Technically expired in 2015, but continues, the program continues to follow its direction. NOAA is suggesting to the HSRP that this could be a good time to review this legislation and the Presidential Memorandum could provide a really good opportunity for much needed attention and momentum on authorization.

There are the -- I'll be talking a little bit more about the Presidential Memorandum

here in a moment. But integral to that, to the national strategy is a whole lot of coordination between agencies.

And this, the OCMIA provides one of the mechanisms for that coordination. One of the missing pieces is the ability to better expend and receive funds between agencies in order to be able to do joint projects and to facilitate partnering.

Next slide, please. So, really the Presidential Memorandum directed the agencies to complete a national strategy for mapping the U.S. EEZ and to complete an Alaska coastal mapping strategy.

So, really the Presidential Memorandum directed us to develop these strategies. NOAA had a big role in both.

I was the co-chair along with Dr. Alan Leonardi of the Ocean Exploration Program of the group that developed the national strategy for ocean wrapping, exploration and characterization. Next slide.

And Ashley Chappell and others were heavily involved in the Alaska mapping strategy as well.

So, this is Section 2. The group on the national strategy for mapping exploration characterization consisted of representatives from NOAA, BOEM, USGS, et cetera, many agencies.

And we worked very hard to honor the original intent of the Presidential Memorandum, but also to incorporate as many coordination functions and existing authorities and organizations as we could into the national strategy so that we would be able to build on the momentum we've had for the last decade.

Next slide. There are really four goals. These are paraphrases of the real document which won't be released until July and is undergoing White House review now.

But the first goal is to coordinate interagency efforts and resources toward mapping, exploring, and characterizing. Our second goal is to actually do the mapping and by mapping, we

really are talking about seabed mapping that we will characterize the success of the program in terms of seabed mapping, but recognizing that any major campaigns for mapping also will provide the opportunity for other baseline-type observations both of the seabed and of the water itself, and potentially some biological and chemical signatures as well.

The third goal is to explore and characterize priority areas of the US EEZ. These priority areas are both geographic and thematic.

So, for instance, on the slide a few slides back called out the Executive Order on critical minerals. That is clearly a national priority. But is really one that is a thematic priority, not a geographic priority.

In addition, there are geographic priorities for characterization depending on the different regions as well. In order to do all this, we recognize that we can't -- the goals that we set out in the national strategy really cannot be achieved using current technology.

We set goals that really only -- we can only achieve through the development of new and emerging science and technology.

And in this space, we certainly highlighted the opportunity for unmanned systems, unmanned maritime systems, artificial intelligence, improvements in communications technology as a result of the new satellite communications constellations that are going up and continued improvements in both sonar and lidar mapping.

And lastly, we recognized and there was a really powerful summit that was held in November at the White House on partnerships with commercial and not-for-profit and philanthropic organizations on coordinating our efforts.

This is a very compelling field and there's an opportunity for real discovery that has some commercial and scientific value and there is quite a few partners that could reasonably be expected to be contributors to this.

And so, we've come up with some structures for that coordination as well across all the sectors. Next slide, please.

In order to do this in a reasonably, in order to have a reasonably consistent product when we're done we need to have some reasonably consistent approaches to doing the work. As all of you know, ocean mapping can be done in a variety of ways for a variety of applications.

In order to meet the goal of mapping once and using many times, we each have to do a little bit more than the narrow requirements of a specific application both geographically and in the way we handle the data to provide access to the data, coordinate it with other groups, et cetera.

So, we've envisioned a Standard Ocean Mapping Protocol which would be updated every few years and would take advantage of new technology as well and drive standardization across many programs. Next slide, please.

Coordinating and executing campaigns.

In order to do this efficiently it's not going to be possible to do little postage stamps at a time. We really need to execute regional campaigns so that large areas are mapped in a coordinated fashion using similar technology and then we'll have a much more, not only more efficient execution of the campaigns but also more consistent result when we're done.

But we do need to, as a first step catalog and analyze all existing data and seek out as much data as we can, get access to commercial data when that's possible, certainly get it from other government agencies and to be able to have a solid foundation for what we have.

Dave Maune already mentioned the 3D Nation Requirements and Benefits Study. This will help us to justify a fairly significant cost for doing this mapping in terms of a wide variety of applications.

I'm glad Dr. Jacobs mentioned ocean circulation. That's often one that is forgotten when we talk about the value of bathymetry. But

understanding global circulation patterns is absolutely critical for forecasting our climate changes over the decades ahead.

And we also need to be in a position to track and report on progress going forward and I'll come back to that later this morning, later this afternoon. Next slide, please.

We have a mapping priorities exercise already in work through the IWG-OCM program that has really shown some good merit and has already led us to some great interagency projects. Next slide, please.

So, it says as an example this is an Alaska example. But looking at all of these different cells, different applications can use these cell maps and be able to do some forced choice prioritization for the areas that are needed for those different programs. And to do that on a regional basis. It would be very difficult to compare, do a relative value comparison of a piece of Arctic seafloor that's never been mapped to a busy waterway some place.

So, I think that we need to really have a regional way of thinking about prioritization. Next slide, please.

Nicole will come back to Section 3 here in a moment. But this is the section on mapping near coast of the nearshore and coastal Alaska. Next slide.

Then the fourth section is really aimed at efficiency of the regulatory environment, reducing duplication, promoting efficiency across agencies to increase permitting and authorization efficiencies for this work specifically.

And this is underway, as well. But we won't be talking too much more about this today. Next slide.

All right. And with that I will turn it over to my boss, Nicole LeBoeuf, to walk us through Section 3 on Alaskan coastal mapping.

MS. LEBOEUF: All right. Thanks, Shep. Aloha again. I am back briefly to talk about Section 3 of the Presidential Memorandum.

As Shep indicated, this is all about Alaska and the need for comprehensive shoreline and nearshore maps which are less available for Alaska than elsewhere, as we know.

Similar to the work Admiral Smith has been doing in support of the strategy in Section 2, it has been an exciting few months for us working on Section 3.

I will just say from the outset I'm incredibly proud of NOS staff and from the staff to the leadership level for co-leading Section 2, for leading Section 3 and for leading Section 4 of the Presidential Memorandum.

As Neil intimated earlier, just having a Presidential Memorandum on anything ocean is very exciting and it's an honor for NOS to be in the thick of things.

So, Section 3 directs the agencies to complete a strategy for mapping the Arctic and sub-Arctic shoreline and nearshore of Alaska. And it is to be led by NOAA coordinated with the State of Alaska and the AMEC, or the Alaska

Mapping Executive Committee.

If you've not heard of AMEC before it is essentially 15 organizations federal and state that coordinate their efforts to map Alaska. And until recently they have been primarily focused on terrestrial mapping.

But when NOAA stepped up to co-chair the AMEC with USGS, AMEC started to shift its focus a little bit more toward coastal mapping. Admiral Timothy Gallaudet is our co-chair from NOAA.

He co-chairs AMEC with the USGS Director, James Reilly. And having them at the helm has been extremely helpful in getting some coastal work going there, as has been the Presidential Memorandum.

So, we worked with the State of Alaska, AMEC, as well as the Alaska Ocean Observing System and others to draft a coastal mapping strategy per the memorandum.

We were somewhat ahead of the game because NOAA, the State of Alaska and AOOS, the

Alaska Ocean Observing System, had already been thinking about Alaska coastal mapping strategy. So, we were able to build from that work when the Presidential Memorandum was released.

Section 3's draft strategy like Section 2 is also at the White House for review. So, there is not a lot that I can do in terms of giving you some specifics.

I can say that the strategy will provide foundational geospatial data and maps and that the coast of Alaska by 2013, I'm sorry, 2030.

As you saw on Shep's previous slide, we do have some high level goals in the strategy which I will share with you. The first is we will build on existing mapping partnerships to meet Alaska's coastal mapping needs.

We will expand coastal data collection to deliver priority geospatial products that stakeholders require. We will leverage innovation and mapping technology development and we will conduct strategic communications to

promote widespread stakeholder engagement.

With regard to the Presidential Memorandum as a whole, as you've heard, NOAA has been front and center in the implementation of this document.

I want to give shout outs to Rear Admiral Smith and Alan Leonardi for their work on Section 2, Ashley Chappell for her work on Section 3, and other key staff at NOS for overseeing NOAA's implementation of the entire Presidential Memorandum's implementation on Section 4 having to do with the streamlining of regulatory requirements.

All three drafts are with the White House for review. We expect the final versions to be released in late spring, potentially early summer and maybe even in conjunction with Capitol Hill Oceans Week.

We will just have to see how that goes. I want to thank you again for your attention to my digital likeness and I would be more than happy to answer any questions if there

is time available.

If not, thank you all for your attention. That's it.

RDML SMITH: I think we would like to hold the questions until the end of the three presentations. I'm going to try to make up a little bit of time here as well.

This next section is on the gap analysis or progress report that we published a month or so ago, or really maybe two months ago now. We were still in the office then. And but is really the third annual update to the national gap analysis for bathymetry. Next slide, please.

You all have probably seen these types of maps. This is a particular variant that has a depth range in it. So, you can get at a quick glance the red areas are less than 200 meters of water that are unmapped.

So, that is a huge level of effort in those areas. In a tabular form, next slide, please, this is not in the report but I think it's a really important and somewhat sobering

look at how big a challenge this is.

For those of you that are kind of ship people this is a level of effort, you know, in a ship year and I would have to dig into exactly what that is or read the paper. But it's a level of effort.

But if you look at the depth ranges from, you know, from five to 20 meters, 39 percent. Up to 40 meters gets us to 65 percent. Up to, you know, to 200 meters 97 percent.

So, 97 percent of the level of effort of getting the US EEZ mapped is in less than 200 meters of water. Only three percent or so in deeper than 200 meters of water.

So, when we think about, you know, what type of technology we need to be developing in order to get this whole project done, we need to be really focusing on that 200 meters and shallower.

By the time we invent some fancy thing to do the deep water we'll be done with it. Next slide, please.

This is just an excerpt from the progress report. The sort of big news is that, you know, over the course of the last three years, from 2017 actually through 2019 so really two years, we went from 59 percent unmapped to 54 percent unmapped.

That's actually quite a -- that's five percent of the US EEZ mapped in that time. A large portion of that however, is just getting the data out of various shoe boxes and into the public domain.

And a lot of that is from federal agencies, even other programs within NOAA. And it's broken down by region.

It's worth noting that the least mapped, by this definition, the least mapped region of the United States is the Great Lakes. And it's in worse shape even than Alaska. Next slide.

This is just, you know, some of the techniques for how to do it. So, this is all in a slick little report that we put out a couple

months ago and plan to update at least annually, maybe twice a year. Next slide.

And that's it. So, with that, Ed, I'll turn it back to you entertain any questions if you see that we have time.

CHAIR SAADE: Thanks, Shep, Nicole. Really appreciate it. In the interest of time we'll go to questions a little bit later when the HSRP wrap-up is going on.

I want to take a break here in a moment. Take a moment just for Anne to go ahead and introduce yourself. Anne, if you're ready, Anne.

MEMBER MCINTYRE: Can you hear me now?

CHAIR SAADE: Yes.

MEMBER MCINTYRE: Great, okay.

CHAIR SAADE: So, go ahead. We'll --

MEMBER MCINTYRE: I am the business director for the San Francisco Bar Pilots and a recently retired 23 career years as a maritime pilot on the Columbia River.

What I bring to the Panel is expertise

in precision navigation and use of NOAA services such as the PORTS system.

So, excited to be here today and to learn more about areas that I don't have a lot of expertise and I'm looking forward to meeting all the new members when we actually get together in person.

Sorry for my technical difficulties earlier.

CHAIR SAADE: Thank you, Anne. And I believe we also have Admiral Gallaudet. If you're available could you go ahead and do a little bit of intro?

MS. STODDARD: I believe that Admiral Gallaudet may be self-muted or no, it looks like he's able to speak now.

Admiral Gallaudet, can you hear us? Can you speak?

MS. MERSFELDER-LEWIS: Admiral Gallaudet, we're having a hard time with the audio. If you want to try again.

MS. STODDARD: I'm not sure if he's

available at this moment. Maybe we can come back to him after the break.

CHAIR SAADE: Okay. So, I am going to let everybody know we're going to be in a pause here for about five minutes and we'll get right back into it.

So, thanks. We're up to 270 participants. So, this is an incredible achievement for all of us. So, see you. Thanks.

(Whereupon, the above-entitled matter went off the record at 2:27 p.m. and resumed at 2:35 p.m.)

CHAIR SAADE: Okay. So, we are -- Lynne, correct me if I'm wrong. But we are ready for the next presentation with Andy and Larry and Rich and Juliana.

MS. MERSFELDER-LEWIS: Correct, Ed.

CHAIR SAADE: Okay. So, without any more delay, Dr. Mayer and Captain Andy Armstrong, over to you guys. We missed you last time.

DR. MAYER: Well, thank you very much. We missed you guys too. But I'm sure we were

doing something also very important.

Let's see if this works now. Do you want my camera on or not?

MS. STODDARD: Yes, you can turn it on. I sent you a camera request.

DR. MAYER: Yes, and I did and it shut right off. Okay.

MS. MERSFELDER-LEWIS: There you go, perfect.

DR. MAYER: Okay.

CHAIR SAADE: It's strange seeing you sit down to present.

DR. MAYER: It's very difficult actually for me to do that. One of the down sides of this.

So, what I'm going to do is kind of briefly give an update on where the Center is with respect to our autonomous vehicle activities. We have many activities but this is one focus.

And I think you all heard a report last time, next slide, please, from Neeraj on our

behalf in terms of where we were. But what I've been asked to do is before I go there is to just briefly touch on some of the potential impact of the pandemic on us.

And as I mentioned earlier, we've been relatively fortunate in terms of our ability to maintain our research work and our analytical work. We were quite prepared due to the competence of our IT group to move efforts out of the lab and to home offices.

Classes continue at the university although all the teaching is online and we've been able to adjust to that quite readily. The one impact that it had on our classes would be our summer field program.

That will have had about three-quarters of that course with impact. The one part is the actual field acquisition with regard to students with data collected last year so they'll be able to go through the motions. And we actually have some opportunities for field work further down the line should we be allowed

to do that.

The other impact is GEBCO Scholars which are a group of international scholars. That program continues but they all have to get visas and they are uncertain whether their visas will come back in time for them to start in September. So, we'll have to keep an eye on that.

As I said, our research activities continue with everybody working from home. The one area that has had impact is on our ASV lab where they really do have to get their hands on the equipment.

But they have been doing an awful lot of software writing and our machine shops have obviously come to a halt except that our machinist happens to have a shop at home and he continues to do things, which is quite remarkable.

We have already had an early summer field program at Thunder Bay National Marine Sanctuary cancelled. That's been deferred to later on.

And the other impact that we suspect will happen is our Annual Site Review is scheduled for the 14th to 16th of July. We haven't canceled it yet but we suspect that most likely we'll conduct that in a virtual meeting. Next slide.

So, you heard hopefully at the last meeting Neeraj kindly presented an update on our activities, the use of our four meter C-Worker vehicle from the Fairweather off Point Hope, Alaska, some work we did up the Channel Islands Marine National Sanctuary where we were able to use the vessels in very hazardous conditions right up against the shoreline and the work that we did at Thunder Bay National Marine Sanctuary which was a nearshore based operation that we operated up to 20 to 24 kilometers off shore.

We also at that time just took a delivery of a DriX vessel which is a purpose-designed for hydrographic acquisition wave piercing vehicle. And we started to play with that at New Hampshire when you heard the

report in New Orleans. Next slide, please.

Since that time we've used both those vehicles in earnest. We had an exciting expedition on the Nautilus and this was part of a search for Amelia Earhart. But what we were doing is using the C-Worker inside the coastal waters where the larger vessel, the Nautilus couldn't get safely in.

And we basically, through a combination of using drones for the very shallowest water and the island using the ASV for the rim around the island of zero to 500 meters or so and then the deep water multibeam on the Nautilus we're able to get a shore-to-deep water complete map in a very, very efficient manner.

I think developing those kinds of protocols is going to be very important as we move out to the Pacific Islands and are able then to complete the entire mission from one platform all at once in an efficient way. Next slide, please.

The other big operation has been

pushing forward on the DriX, which again I think we see as a very seaworthy hydrographically designed vehicle. We've had it operate up to 12 knots without any degradation of data which is really spectacular.

And so, here with remarkable cooperation from the crew and captain of the Thomas Jefferson it went through a series of first dockside trials where the davits on the TJ were modified to handle the launch and recovery system of the DriX.

Went through a lot of testing and then finally up to the big days of field trials and approaches to Chesapeake Bay off Back Bay, I think. Next slide.

We were privileged to have the first real in earnest trials next, I think if you click see what happens. Yesterday we had Admiral Smith helping Captain Welton there direct the vessel. And you can see on the slide on the right there's actually Admiral Gallaudet directing the ASV operations.

But the bottom line is after a lot of hard work done on the crew's part and the DriX team's part and I think both Admiral Gallaudet and Admiral Smith were, really it was a very boring day because everything worked perfectly. The vessel just launched beautifully. Next slide. Went out, did its survey. Surveyed for a few hours, parroted the data back, data came back beautifully, came back, swam automatically to its recovery system and came on board. So, it really worked nice. And I think we all went home that day very, very excited about the potential for these sorts of systems. Next slide.

It gave us some ideas though. And that was, how do we take that really intriguing launch and recovery system which is like a rib sort of vehicle and maybe we can make it more universal with its application?

And so, what we've done is now designed what we call a Universal Delivery System. So, the DriX as you can see sits on the bottom half.

And this top half comes and snaps down on it for launch and recovery. Next slide. But at the same time you can put an insert in there for any sort of autonomous underwater vessel or other vehicles, hybrid vehicles too.

We're getting them designed for the myriad hybrid vessel too. So, what we then have is if you go to the next slide the opportunity on a very small deck space to be able to launch and recover multiple vehicles.

And so, here this is a configuration that would fit on Okeanos Explorer. This is for the Nautilus in this case, but almost any vessel of that size.

This is just one quarter. So, the ROV operations are launched from the rails on the other side. Next slide.

You can basically, pick up the DriX in this case. Next slide. It's going to be like a cartoon so you just click, click, click.

Launch the DriX. It goes off, come back. Snap down and recover the autonomous

underwater vehicle. Go ahead, keep going. Click, click, click.

Pick up the autonomous vehicle. Let it go and now you have both vehicles, okay, stop at that point, thank you.

And what this then provides the opportunity is this really opens up a very exciting world of ASV-AUV collaboration where we can now through optical modes start communicating between the autonomous underwater vehicle, the AUV which becomes a relay and can now transport high bandwidth data to the mother ship or even to the shore.

So, it really opens up a very exciting world. And this is something we hope to be exploring in the next couple of years. Real high bandwidth communication between the underwater vehicle and the surface vehicle.

And when we talk about things like characterizing it opens up a tremendous new capability. Next slide, please.

Now, the final point I want to talk

about is another project we're involved in which is, it's called the Saildrone SURVEYOR. I think many of you are familiar with the small Saildrones that have been very successfully deployed on a number of NOAA missions.

What this is is a Saildrone on steroids. It's 72 feet long. You can see a little man standing there for scale and I'll show you in a minute that's not an exaggeration.

This is a vehicle that can carry a large deep water multibeam system, it will carry a large deep water multibeam system and many other both acoustic systems for shallow water mapping and water column mapping, a full environmental suite, including an eDNA system.

So, it has capability of truly being a characterization system. Next slide, please. To show this is not just a dream this is -- there are a range of environmental sensors that might be on there. The sonars that are on there, the EK80s, EM2040, EM304, and the MBARI eDNA sampler and then a range of other environmental sensors.

Next slide.

We were hoping to get this in the water in May. But the COVID crisis has slowed it down a little. And so, we're looking at a launch in July.

Here you can see it for scale next to the other Saildrone. One more slide, please.

And there next to a person you can see how very, very large this is. So, we're very, very excited about it.

Final slide, our research goes beyond just operating the vehicles. It's how to operate the vehicles and how to go from unmanned systems -- what I've been describing, none of them are truly autonomous now but all unmanned and supervised.

But we're doing a lot of research in the lab to try truly understand that transition to autonomy looking at things like using chart information to feed into the autonomous vessel, having decision systems, having the vessel use machine learning and artificial intelligence.

Is somebody asking a question? Okay, I'll just keep going. Artificial intelligence and recognizing objects and recurring behaviors that respond to that.

Then the last slide, please. Beyond that then taking that data, using the local visualization lab with respect to augmented reality and virtual reality and start trying to design a truly autonomous operating center where the operators can get the full environment from the autonomous vessel.

I think I'm going to stop there. And I hope I didn't use too much time.

CHAIR SAADE: Great job. Is Andy up, Larry, or is this the end of the presentation?

DR. MAYER: This is the end of the presentation.

CHAIR SAADE: Okay. We'll have some questions later. Riveting, as always, very exciting. Next up is Rich Edwing.

MS. BLACKWELL: No.

CHAIR SAADE: Is Juliana Blackwell.

MS. BLACKWELL: Hello. Right on cue my dog is barking. So, sorry about that. Hopefully he'll calm down.

Greetings, everyone. It's a pleasure to be able to update you on activities related to the National Geodetic Survey.

In particular, recent activities having to do with the modernization of the National Spatial Reference System and with our coastal mapping program. Next slide, please.

So, as I've updated the Panel many times in the past about our progress and happily be able to say that we've been keeping up with things and making everything stay on track.

Unfortunately, even a little bit earlier this year we had to stop and take a look at how things were going and analyze our operations, our workforce and some of the other issues that we've all been challenged with and saw that because of these things and how they're compounding we need to reevaluate whether or not a successful rollout of our modernization effort

in 2022 is even feasible at this time.

Full disclosure, this was something that we had been talking about earlier this year before we had the pandemic. So, these things are compounding even moreso.

I can't really give you a date at this point in time or, but I do want to just let you know that I'm going to continue to update HSRP and we're going to continue to work on messaging once we have a better understanding of how this is going to play out.

In the meantime, for those of you who are not familiar with our NSRS modernization effort or for those who are interested in updates in between HSRP meetings, I invite you to track our progress by clicking and signing up for NGS News or visiting our New Datums web pages.

Next slide, please. I'm pleased to say that we have accomplished a few things since our last meeting and I want to highlight those here on this slide.

The first is that we completed the

evaluation of our third and likely final Geoid Slope Validation Survey. The work was conducted in 2017 in mountainous areas out in Colorado.

And this was the third in a series of areas that we did a various number of geodetic measurements on and did a huge amount of analysis on and invited others to look at the data as well and compare it.

I'm pleased to say the results of these validation surveys give us the confidence that we will be able to deliver a one centimeter differential geode accuracy in coastal regions, a two centimeter accuracy in the Great Plains, and a three to five centimeter accuracy range in the Rocky Mountains when we are finished with our project and our modernization effort.

So, that's great news. The second item is again just knowing that we were starting to slide a little bit with some of the data collection and some of the partnership efforts due to some events from last year including the shutdowns, we've already conducted a very

comprehensive review of the different projects that are very integrated and necessary for the modernization effort.

So, we've taken a look at those and we've looked at how we can reprioritize those projects to be able to deliver as much as possible and as soon as possible. But we want to make sure that we get things right.

So, we're going to take our time in evaluating things and continue to look for opportunities to make up some ground and maybe adapt in ways we didn't think of before of how we can make this possible even sooner.

But we'll keep you posted on that as things evolve. The third thing is I just want to mention that we've integrated our VERTCON tool into our larger NGS Coordinate Conversion and Transformation Tool that we refer to as NCAT.

So, this is something that's going to help us not only now with making things easier for our users but is the framework, the software framework, for being able to connect our updated

reference frames and datums in the future very easily into this existing tool.

So, we'll have easy, fast access for updates and transformations from NAVD 88 and other current vertical datums into the future in NAPGD22 orthometric heights. Next slide, please.

So, you've heard me give updates on our airborne gravity collection which is part of our GRAV-D effort. I want to just highlight that here on this slide.

Our goal this year was to collect up to or get a collection of up to 87 percent of our total area.

Unfortunately, since the data collection is on hold until further notice no matter what we do at this point with the various scenarios that are in hand with our aircraft, personnel, the geography that we have left to fly and our resources it's very, it's going to be nearly impossible to get to 87 percent completion at the end of the fiscal year.

Right now we're just over 82 percent.

The areas that you see in green are those that have been collected and the data is available. It's basically those are the blocks that are complete.

Orange areas are those that have been started. Blue block is one that's been collected but is now being processed. And the white blocks that you see are those areas that have not been started yet but are planned.

The importance of having the airborne gravity is that this is really the foundation of a lot of the -- a foundation of the vertical, the height component of the modernization effort. Without this being complete there really isn't a next step.

So, this is a high priority in order to be able to get this done first so that we can continue to build our data, our products, our services on top of this and be able to deliver the NSRS modernization. Next slide, please.

The other key component of the modernization effort that is still underway is

the -- or the data collection component of it that's underway is the establishment of the foundation CORS component of our NOAA CORS Network.

I've mentioned this in the past. This is still something that we are working on. We've got a number of challenges. But we have made some headway in identifying the number of stations that we seek to establish as Foundation CORS.

At this point in time, the plan is for a total of 36 stations. We are looking at three different ways to bring these stations up to par to serve as the highest quality, highest reliable stations within the CORS that will support our citizen's access to the NSRS and also support international positioning efforts.

We're looking at incorporating partner stations. We're working with NASA and the National Science Foundation to bring some of their sites into the Foundation CORS Network.

We're looking to upgrade a number of

the sites that NGS owns to make them fully GNSS capable. And we're also looking to build approximately nine new stations in areas that we don't have an existing site.

And those would be co-located at sites with existing space geodetic techniques. Next slide, please. Next slide, please. There we go.

On the coastal mapping side program work is continuing with funding from the hurricane supplementals from the last couple of years. I want to mention briefly the 2018 supplemental and the areas that the data has been acquired, they're currently reviewing and accepting additional deliveries of the data in the areas that you see here on the left.

These are a result of Hurricane Florence, Hurricane -- I'm sorry, Hurricane Harvey, Hurricane Irma, and Hurricane Maria. You see those in red, yellow, and green respectively.

Those areas have been acquired and again, we're in the process of reviewing that data. This is data that's topographic lidar,

aerial imagery, and updated shoreline in these impacted locations.

From 2019 work continues in the acquisition phase in response to Hurricanes Florence, Michael, and Typhoon Yutu. We've got about 80 percent of the data acquisition that's been complete.

One thing that I want to note in particular with Typhoon Yutu and some of the research, hopefully operational work that we'll be doing in the North Carolina area is using a deep channel lidar in select areas to obtain an enhanced coverage of those areas that experienced storm-induced sound-side flooding and inundation and in areas where water clarity and bottom reflectivity are challenging for the narrow channel topo-bathy lidar sensors that we use.

In the areas for Yutu we were able to use the deep channel data lidar and were able to collect depths to approximately 50 meters.

So, while this might not be ideal for exact charting work, the concept is that this

will assist with the NOAA ship data collection, hydrographic survey collection, providing situational awareness and reducing inefficient operations in the shallow areas.

So, we're building upon this technology to help with a lot of the hydro work that's being done and looking forward to updating you more on the results of the deep channel work. Next slide, please.

I want to briefly mention some additional work that's been done using our Remote Sensing Division's expertise. This is the emergency response imagery that unfortunately you often see in these updates because there is always something going on.

This time it was in Tennessee. As a result of the tornados that went through in early March, NGS collected damage assessment imagery.

On March 7th, the areas that were impacted from Nashville to Cookeville, Tennessee we had over 1,100 images that were collected and the data was made publicly available on March

9th.

This was an opportunity to collect imagery not only to support the emergency response effort, but also to test out new processes to improve delivery efforts and to support artificial intelligent users who use the NOAA imagery as training data sets.

So, the two images on the left you see are images of the damaged areas. And the images on the right, the top right, are basically what you will see when you go to our NGS website and are able to look at those images, zoom in, click on the image, view it or download it.

The darker image on the right at the lower part of the slide is a link to a web story that was done by USA Today and the Tennessean which highlight some of the work that's being done on creating cloud-optimized GeoTIFFs to support artificial intelligence.

So, I know we don't have time to go through that today. But I would, for those who are interested in AI and the things that we're

doing I invite you to take a look at that link and see how that is being used to help promote advancement in this area of interest.

Next slide. A very quick update on our VDatum efforts. For those who are not familiar with what VDatum is it's a software tool that's been developed jointly between NGS, OCS, and CO-OPS. And it provides a tool for vertically transforming data between different tidal, orthometric, and ellipsoidal datums, vertical datums.

Just very briefly, we've been working on providing an update to the West Coast Regional Model that is still on track and we are planning on a release date in, I believe it's Quarter Four in FY21.

So, it's still a little ways away. But we are making progress. The top two colorful images that you see on the slide depict our exploratory modeling efforts in the State of Alaska.

We've been leveraging a previous model

that was developed by Notre Dame and we're using this and running it through VDatum to look for areas of what's acceptable and areas where improvements are needed in our modeling.

So, we're looking at areas that we would need additional foundational geodetic and water level acquisition, additional bathymetry and additional shoreline. So, basically it's giving us an idea of what's needed to make the models work for us with the levels of uncertainty that we are expected to deliver with VDatum.

The last set of images there under supplemental just to let you know that we are collecting foundation geodetic and water level data to feed the model development in those areas that were impacted by Hurricanes Harvey, Irma, Maria, Florence, and Michael. So, that work continues.

Next slide, please. And then for my last slide just a very brief update on what we've been doing as far as a companion document to our NGS Strategic Plan that was released last year.

While our Strategic Plan goes into great detail about our goals and the objectives to accomplish our goals operationally, it doesn't adequately address what we need to do to ensure that we recruit, hire, develop, and retain people with the right skillsets, the knowledge and the experience and the competencies that we need not only now but into the future.

So, we've taken a look at the most important asset that we have and that is our workforce. And what we have now and what we need to build to be successful in the future.

So, we are very close to having a final draft of our Strategic Human Resources Plan so that we can help guide the workforce development within NGS.

It includes not only our strategic direction but a gap analysis, some concepts as far as succession planning and career development and strategies for getting our workforce prepared for the future not only in 2022 but beyond and ways that we can actually implement monitoring

and evaluating the success of our Strategic Human Resources Plan.

So, with that those are my key updates from NGS for the past six months. And look forward to talking with you all soon. Thank you very much.

CHAIR SAADE: We're way over time on all this. If, Rich, can you give us a really brief update, if that's possible? I think you're muted. Rich, I think you're muted.

MR. EDWING: Now, I'm unmuted.

CHAIR SAADE: Okay.

MR. EDWING: Ed, can you hear me?

CHAIR SAADE: Yes. Go ahead.

MR. EDWING: Okay, yes. So, I have a relatively brief presentation here. I'm going to focus on two topics.

I'll talk a little bit about the impact of COVID-19 on our operations. And I'm going to talk a little bit about visibility observations and forecasts.

That's a topic that the HSRP has been

very interested in the last few meetings, has provided some recommendations on how we should be improving the information that we provide on that topic. And then I've got some good news there.

So, next slide, please. There we go. So, like other organizations the biggest impact of COVID-19 is on our field operations.

We're responsible for something called a Mission Essential Activity which means we have to keep the real time oceanographic data flowing. It's a real time -- I'm sorry, safe and efficient navigation, for coastal hazards such as tsunami warnings and storm surge, emergency response and things of those nature.

The PORTS system and our NWLON network are the main ways that we provide those. You know, those sensors are putting out updated information every six minutes and we have to keep those systems going.

Being a Mission Essential Activity places certain requirements and responsibilities on us.

So, when we sat down six weeks ago or more and started planning out how we're going to deal with the situation, as Nicole emphasized and Dr. Jacobs and others, you know, the safety of our employees and our responsibility for social distancing to avoid being transmitters of the virus were the main drivers for us.

And it didn't take us long before we decided we were going to defer any sort of scheduled maintenance either by ourselves or by the contractors that we had that do the same kind of work and that we'll just do emergency repair work on a case by case basis.

Not every sensor that goes down necessarily has to be put back into operation. It depends on what kind of sensor it is and who is using it, those that require conversations with the stakeholders.

But there are some that are, you know, that are critical and will need to be put back into operation. The thing that allows me to sleep better at night is, you know, we put a lot

of effort into very robustly designing and constructing our observing systems.

So, they don't fail very often or at least not catastrophically. A lot of redundancy built in, hardened platforms, things of that nature and they are fully automated and we just try to go there once a year.

So, I have a lot of faith in our observing systems. And then finally kind of a broader topic is across the organization we've been looking at where do we have single points of failure for key functions in case people do start coming down with the virus and can't come to work, who can kind of step in and keep things going.

So, we've been doing a lot of that as well. All right. So, next slide.

Okay. And so how has this been impacting us so far? Well, one of the main things is, you know, scheduled maintenance is something we're not going to be able to make up.

You know, right now our projections

are out to June as long as we shut down travel for sure. And by then we'll have missed 50, you know, scheduled maintenances at NWLON stations.

There is a related number for PORTS. We didn't come up with that number. But those are things you really can't make up because you can't make up for lost time that way.

Most of the rest of the things on this list are just going to slide to the right. Some of them maybe later this year, some of them maybe to next year.

We're really not sure, you know, exactly how that's going to work yet. It just all depends on how reconstitution works out.

You know, one of the big things we were going to start a multi-year current survey in the Columbia River. And that may, we may get a piece of that in at the end of the year or maybe it's going to slide to next year.

You know, that's going to delay the predictions being updated that much longer. We've got a couple of significant reconstruction

projects for a couple of our Great Lakes stations.

One in the Great Lakes, one in the Gulf. And those are going to move to the right as well. We were literally getting ready to install a new relatively large PORTS installation for the U.S. Navy in Kings Bay.

But that's been put on the back burner for right now. We'll see if that happens this year or next year.

Two smaller ones, one up in Valdez, Alaska and one in Portsmouth, New Hampshire having the same situation. We'll see if they happen in this fiscal year or next year.

I've spoken to you about our update of the IGLD. And actually this next, this piece is done more by NGS than us. But as a GNSS campaign that was supposed to happen this year.

There's a big campaign that's done every five years. And I think that it was just decided that this one is being canceled and cannot be done this year.

It's going to have to be done next year which has some consequences associated with it. You've heard Juliana just talk about VDatum modeling and part of that was doing water level surveys to reduce the uncertainty of those models. We've got a number of those surveys planned in different parts of the country.

Some are base funding, some are hurricane supplemental funding. I won't go through the areas, they're in the bullet.

But again, those are all moving to the right which will delay, you know, the updating of those models and reducing of uncertainty of those models by a like amount. And that's from the field operations impact.

And just one concern I have kind of a longer term impact is, you know, we primarily use small business contractors as our service contractors to maintain, deploy, renew our observing systems.

It's possible some of these folks may go out of business, I don't know. And that's a

big loss for us. It's not a big capability out there.

So, I've not heard of anybody in that situation. But who knows. So, that's a concern for us. Okay. So, next slide.

Okay, visibility. Visibility was one of the more recent additions to our PORTS network. I would say maybe about ten years ago we came up with the capability.

You know, our users are asking us for a fog sensor basically. And we worked with the FAA and US Coast Guard and we tested a bunch of sensors.

At the time visibility sensors were very commonly in use for highways and inland for, you know, that transportation system. But a lot of them weren't suitable for the marine environment for a number of reasons.

But we were able to find one. We settled on the Vaisala, a sensor which you see a picture of that to the left. And there have been 14 of these stations put in across the U.S. in

various PORTS systems.

You can see the dots on the map there and it's got the numbers right below. And the Corpus Christi PORTS which is a relatively new PORTS but it's been extending light crazy already. It's in the process of adding seven visibility PORTS. So, they're expanding that subcomponent of the PORTS network by 50 percent right there.

And the Vaisala is a good sensor, but does have some drawbacks. It requires power, hard wired power.

You can see in that picture of the sensor itself are actually those horns at the top of that structure on the right. And there's a number of constraints to having to site this.

So, we really wanted to try and come up with a better visibility sensor. So, next slide, please.

So, a couple of years ago we put a proposal in through the NOAA Small Business Innovation Research Grant, which is a great

little program if you need some sort of technology developed. You can put some concepts out there and if they get approved internally they go out for bid.

And the end goal is for that commercial entity to develop something they can then sell. They're developing for the commercial market, although we're getting a technology that we need for ourselves in that process.

And there's a couple of different phases to that. Phase 1 which is kind of the concept development, prototyping phase is done. And, you know, part of our concept was we wanted a lower power, robust, easy to maintain device.

We didn't get into the different kinds of technology, if you will, but the successful candidate is a multi-spectral sensor suite. And it can actually, you know, right now our visibility observations just kind of tell you what we think.

It's an extrapolated how far do we think you're going to be able to see, it's going

to be fog-free or not. This provides some very nice imagery products, which I can't go into.

That gives you a lot more information about what's going on. And right now we're in Phase 2 which is a couple of year effort to how is this going to integrate into our network?

And at the end of that we'll have fully tested it. Is it the right sensor for what we want? Hopefully, yes. And then we would be able to start kind of offering it through the, you know, to our partners.

But I'm excited about it because it's much lower cost, much lower maintenance on it. And it doesn't require hard, you know, hard-wired power or kind of a lot of that physical infrastructure.

So, significantly less expensive. And it should be able to be integrated right with an NWLON station before we kind of have put in a separate data collection platform and some other things to be able to support that visibility sensor.

This could be integrated right with an NWLON station or a PORTS water level station, be put up on, you know, the meteorological mast. And we can get it up higher so we can, you know, even give a better, a larger range of what visibility might be like.

And this sensor also has the ability to potentially provide other kind of measurements as well. So, to me, the holy grail was always getting a better technology with better products for less money and this is really, you know, hitting both of those aspects hard, I think. So I'm very excited about this.

Next slide.

CHAIR SAADE: Rich, I'm sorry. We only have two minutes.

MR. EDWING: Okay. Well, I'll be quick then. So, I've spoken before about the Tampa Bay Marine Channel Forecast.

This is a capability developed by the Tampa Bay Weather Forecast Office. They had been given some funding to do a development effort.

And they kind of integrated into our OFS model a very specialized weather and wave forecast along the marine channel.

But they also came up with a way to do visibility. But it was kind of a one-off. And that's where we are today. We just have one area where we can do these forecasts.

So, last slide. The way forward now to make this a national capability is the Weather Service is in the process of updating their National Blended Model. And this is a model that provides WFOs with all sorts of different kinds of forecast information that they can use to make their marine forecasts. And they're going to be adding the visibility capability to that. And that will be done by this fall.

Just provides the capability to do this nationally. There still needs to be some work done at a local WFO level.

But another piece to this is, in the Gulf, we're getting ready to upgrade our Northern Gulf of Mexico Operational Forecast System. The

big upgrade is going to be a broader geographic scope to cover the entire Gulf Coast as well as high-resolution nested grids up into seaports like Mobile. It's going to go up the Mississippi River into Baton Rouge. And that's going to allow the capability for this probability or visibility product to be put out there.

And we're going to work with the Weather Service. We're probably going to pick one location, likely Mobile, to do this first. But then once we kind of get that pipeline and that process worked out we'll be able to do it at other locations as well.

And so, that's probably, you know, a year to two years away to being able to deliver that. So, there's a lot going on with the CO-OPS in terms of, at least our role within the visibility realm of providing observations as well as working with the Weather Service to put out, you know, visibility forecasts.

So, last slide, which is questions. And I'll just turn it back over to you, Ed.

CHAIR SAADE: Thank you, Rich. We'll have to move along here. Shep, the same restrictions, if you can be quick.

RDML SMITH: I'll do as best I can. Jump to Slide 3, please. All right, so, consistent with the federal and CDC guidance, our folks are mostly working remotely, and our routine field operations were also curtailed as a result, to be consistent with that guidance.

The NRTs are in a ready state. Equipment is calibrated and ready to go. But they're not doing routine operations.

Our contractors, the award of task orders to individual contractors continues to be a priority for the Operations Branch. We have some done already.

On a case-by-case basis, impacts and mitigative strategies as a result of COVID-19 will be discussed during task order negotiations. Of the two awarded task orders to date, the COVID-19 is impacting schedule with field operations delayed.

Contractors are encouraged to monitor the ongoing COVID-19 situation and incorporate any anticipated COVID-19 related impacts into their proposals during negotiations.

Following award, the Government will address any unanticipated COVID-19 related impacts on a case-by-case basis through consultation with the contractor and the Contracting Office.

For charting, our charts are going out every Thursday just as usual. The amount of new source coming in has started to diminish somewhat, but we still have hydrographic surveys in the queue, shoreline surveys in the queue and we'll be making chart updates routinely. In addition, we've been able to focus some considerable effort on our rescheming so that we're building new charts in the ENC scheme that we've discussed previously.

Skip to Slide 5, please. Raster chart production, sunset of raster chart production. Captain Kinner already mentioned this once. We

announced in the fall the beginning of a five-year sunset period where we will be working with the interagency, our interagency partners, particularly the Coast Guard, for the impacts to regulations and training and testing of mariners, et cetera.

But the time frame of five years was chosen because looking at the linear, nearly linear graph of demand, that's about when it crosses zero. Now, we don't expect it, if we continue, to be completely zero. But -- because there are reasons, residual reasons for having paper, but it is no longer worth the amount of production focus that it would take in order to maintain a similar suite.

So, we're focusing on digital charting instead and have made provision for printing that digital charting information to meet the need for charting practice. Next slide, please, for paper chart.

This is a quick example. On the left is the traditional paper chart of the region. On

the right is an experimental chart-looking thing that is the -- derived entirely from the ENC.

We are working already on getting the landside topography on there, doing a little better job with feature names, et cetera. But there are some significant advantages already evident in this.

One is that we can have true metric contours and more contours. So you can see in this case we chose a blue tint that was different than the blue tint on the chart that would be a user choice.

So, the blue tint was relevant for the charting application for the particular vessel. And the second is a much more rigorous treatment of unsurveyed areas, those big gray areas on the north and the south end of this chart are areas where there is no meaningful survey data.

And that's more rigorously captured in this presentation. We can skip ahead to Slide 8, please. Actually, would you mind going back to Slide 8?

The, this is the -- you deleted them already. That's okay. There is a service where we show the progress of buildout of the new charts.

The S-100 services timeline. These are the services that comprise the precision navigation basket of services, some of them.

This is the first look at an initial timeline for the development, testing, and eventual deployment of those services. And I think of note here, we really already have the surface currents developed. We're really waiting on the dissemination to be mature for that. That's coming along very nicely. I had hoped to have something to report to you at the next meeting.

And -- but it will be an entirely cloud-based system coordinated internationally and -- as well as through our value-added resellers. And there's been a big push for demand for S-102 bathymetry.

And the standard is now set. And so,

we are developing the database and the service to provide high-resolution gridded bathymetry as well. And that will be suitable for navigation but with the applications beyond that as well. And that is all. I will stop there. Back to you, Ed.

CHAIR SAADE: We're going to delay any additional questions at this time and start in with Julie Thomas' session. So, Julie, do you want to go ahead and take it from here?

CO-CHAIR THOMAS: Okay. I think I am on now.

CHAIR SAADE: Sorry, Julie. I'm sorry, Julie. We are going to take a quick five minute break first.

CO-CHAIR THOMAS: Okay, great.

CHAIR SAADE: Thank you. So, when we come back Julie will be all set with the other panelists. So, everybody in five minutes. Thank you.

(Whereupon, the above-entitled matter went off the record at 3:26 p.m. and resumed at

3:33 p.m.)

CO-CHAIR THOMAS: All right. So, I'm Julie Thomas, as you know. And I'm going to lead this next section. We're going to be addressing the one issue paper that we have outstanding right now.

We're going to be also very briefly talking about our matrix prioritization spreadsheet and then we will also hear from Ed Page and Lindsay Gee regarding the Arctic and Technology Working Group. It's a brief update.

Under the issue paper, can we have Gary on?

MS. STODDARD: Gary, it appears you might be self-muted.

MEMBER THOMPSON: Can you hear me now?

CO-CHAIR THOMAS: That's great, Gary, thank you. So, Gary has been taking the lead on this issue paper.

It's gone through a few different realms of edits and changes. Gary, why don't you give us just a brief update as far as where the -

- what it's about and where the status is right now?

MEMBER THOMPSON: Okay. So, the paper gives a good overview of the disaster recovery products and services that NOAA provides, how critical they are.

But the focus of the paper is that -- and you've already heard discussion in some of the presentations about the use of AI. But the focus of the paper is to do more with AI to help with disaster recovery because the imagery, the other products we can serve, are very valuable information.

But there's a lot of time being spent on the user end analyzing that information. And with the use of AI, for example, to determine where damage is at, where beach erosion has occurred, where there is a lot of debris, AI could be used to help us do that in a more efficient manner so that we could get recovery efforts quicker and get the resources to the areas that need to be -- that need the resources.

So, the focus -- the recommendations are to look into more, to see what the users need, states, local governments, and then do research into utilizing AI more for more actionable items and products and services that can help us with disaster recovery.

CO-CHAIR THOMAS: Right. And I think, do you want to talk about a little bit of the feedback or the questions that Lucy had because it might clarify a couple things?

MEMBER THOMPSON: Right. So, Lucy had asked some questions about -- as far as funding. So --

CO-CHAIR THOMAS: Lucy is one of your Nav Managers, right?

MEMBER THOMPSON: One of the Nav Managers, correct. So, Lucy is involved with NGS and the disaster imagery.

And so, do an event and -- I know we work with FEMA and then there's task orders given to provide to NGS to do imagery. And so, there are funding sources for different parts of NGS to

provide this information.

As far as the question about people and resources. We feel like the AI -- for example, we were spending 24 hour days, three shifts of people to analyze this imagery. And so, with AI that just really alleviates having to use people to do the manual editing of it, manual analyzing of the imagery. And I'm looking to see what the last question was.

I think that was the two things that she had asked about.

CO-CHAIR THOMAS: Okay. And then I think we also we had a comment about whether or not we wanted to put more specifics into the recommendations too, and not keep it too broad.

MEMBER THOMPSON: Right.

CO-CHAIR THOMAS: So, like I said, this paper has gone around a few times. I think what we'll do is send it one more time with -- Gary, maybe we'll touch base on this after the meeting in the next few days, and maybe send it out one more time where we can even give a

specific example within the recommendations as just an example of what we're really asking for here.

MEMBER THOMPSON: I think that's a good idea. And we can -- we'll focus our recommendations on what we have in the paper.

CO-CHAIR THOMAS: Right, because I know that from NOAA's perspective there is a lot of AI that is being used. So, it's like where can really focus that AI to benefit people that are in your role that are -- that need this quick turnaround?

I think I was going to go around naming. Okay, let's do this real quickly. We're going to just go around and see if people have comments on this issue paper because we would like to include it with our administrator letter.

And so I'm going to just very quickly go through. If you don't have any comment or want to send it in in writing, just say pass, and that way we'll make sure we get everybody's input on this. Qassim? I guess you need to unmute the

Panel.

MEMBER ABDULLAH: Yes, sorry, I was muted from that other side. I think I agree with you, Julie. We need to add a little bit of specifics to it just because AI is a very wide thing, you know.

So, we just need a little bit more specific. What we're looking for with AI to help us for what Larry is saying, you know, Gary is saying, the interpretation for which kind of feature we need to extract. One we know that, then it will be easier to line up solutions for it.

So, we -- if we're going to pass it around we can comment on it and Gary, maybe you can help us to form a plan which will explain, like, in the disaster recovery, I mean, what you're looking for. Are you looking for destroyed houses, flooding, all the different AIs and different tools, for example?

CO-CHAIR THOMAS: Okay. We'll definitely -- I made a note of that. We'll

address that one. Anuj?

MEMBER CHOPRA: Thank you so much. I think using AI is perfect. Let's just make sure that the models are self-learning so that it can be -- that perhaps needs to be included that they are self-learning. And I think that should work well. I think that's the way to go. So, thank you.

CO-CHAIR THOMAS: Sean? Sean, are you self-muted?

MEMBER DUFFY: Should be free now. Okay. So, I agree you just need a couple of touches. And I know one of the things mentioned was related to ports reopening.

I think some of the specifics, ports have kind of adapted their own kind of models. But having this info together is very good.

And, you know, as a -- just some navigation guy I have to say, you know, the artificial intelligence is great. But will it overcome our ability to use it, or as I have said before, natural stupidity?

But how do we make it where it gets to the end users and it's good? And with that, I'll look forward to trying to work on some of that because there are real specific ways to reopen a port and this could indeed be helpful. Thank you.

CO-CHAIR THOMAS: Okay, thanks. Nicole?

MEMBER ELKO: I'll actually pass. I'm happy to review the next round.

CO-CHAIR THOMAS: Great, Lindsay?

MEMBER GEE: Yes. I just -- I support the paper. And I just think we need to be careful in adding more comments that we don't dive down into the details of trying to tell, recommend solutions.

I think as an HSRP we should be just saying look, this is an important issue to look at for the stakeholders to apply artificial intelligence to, and then kind of leave that to the, you know, the specialists to do that, to define the areas.

So, that's just my comment, that we don't go around the buoy again, as they say. I don't want to see us trying to bring out specifics in that. That's it. Thank you.

CO-CHAIR THOMAS: Yes, great comment. Deanne?

MEMBER HARGRAVE: Yes, thanks. I have nothing further to contribute at this time. Thank you.

CO-CHAIR THOMAS: Okay. Let's see, Ed Kelly? You're on mute, self-mute.

MEMBER KELLY: Okay. I'm unmuted now. The information that is required by Coast Guard and to reopen the ports is absolutely essential.

We've run into that with Sandy and the post operation with that. And I would leave the AI to the scientists and to NOAA to figure out how to make information available in a complete fashion and as quickly as possible.

But I fully support the paper. To reopen ports and marine commerce, that information is absolutely essential. The faster

we get it, the better we can use it.

CO-CHAIR THOMAS: Okay, thank you. Ann Kinner?

MEMBER KINNER: Yes. In San Diego we have a resiliency team that's been put together that basically includes all the different bodies who are involved in the port operations. And they did a pretty good overview a couple of months ago of what kinds of things were available.

I would be surprised if there aren't similar groups and similar kinds of, I want to say, lists of what they need already in other ports around the country.

I think the paper is great as far as it goes. And I just think it might make some sense to reach out to some of these more local bodies who have done this kind of study within their own area.

CO-CHAIR THOMAS: Okay. We can take that into account. And -- Dave Maune?

MEMBER MAUNE: I would like to see if

it's possible to include one or two images that demonstrate the kinds of things you can do with artificial intelligence.

I always find that if an issue paper is all words it's more likely to be set aside and not read. And people look at the pictures first and then look at the words that go with them. And I think that a couple of pictures could be worth a lot to improve this issue paper.

CO-CHAIR THOMAS: Good comment. And I think we'll just have to figure out how we can do that within the length of what we are talking about.

But we'll come back to that, Dave. Anne?

MEMBER MCINTYRE: I just would say that I agree with what Sean and Ed had said about the importance of being able to reopen the ports in a timely manner.

And I don't know much about AI, but I find it fascinating and just wanted to thank everybody for their hard work on this project,

this paper.

CO-CHAIR THOMAS: Great, Ed Page?

MEMBER PAGE: Thanks. I agree with Lindsay as far as let's not over-engineer this thing. I think that -- let others decide the actual mechanics of it.

I also think Dave Maune is -- for some graphics or pictures would help. As a prior Captain of the Port and dealing with these issues of deciding when to open a port after some events, the Northridge earthquake and storms, what have you, the faster information gets to my hands, the quicker I can reopen, get the blue economy back in business.

So, I think this expediting information and getting it in the hands of the decision-makers, which Gary is taking the lead on as far as how do we do that, AI is a great way of going about it. So, I applaud your paper. I think it's looking really good. I wouldn't go too far over-engineering. I think a graphic or two and let it go. Thanks.

CO-CHAIR THOMAS: All righty. Sal is not with us today, couldn't make it. So, Ed Saade, do you have anything to contribute to this paper?

CHAIR SAADE: I don't have anything, Julie. Go ahead, thanks.

CO-CHAIR THOMAS: Okay. In the interest of saving time here -- okay, those are all great comments. I really appreciate them.

Gary, let's get together on this and see if we can get it together within the next couple weeks so we can actually include it with the letter that goes out.

MEMBER THOMPSON: Very good.

CO-CHAIR THOMAS: Is that okay?

MEMBER THOMPSON: Yes.

CO-CHAIR THOMAS: Great. Thanks so much for your input, Gary. And speaking of the letter, I wanted to just take a minute to thank Sean Duffy. Sean is going to be working with me on the letter for the administrator.

You will all see that. Remember this

letter will have recommendations. It will be brief and shorter than our normal letter. But we do want to make sure that we follow through with that tradition. And it will all go out to you for review before we submit it.

Next, let's bring up the priorities matrix real quickly.

So, as you know, the priorities matrix is kind of a running spreadsheet that we have kept for tracking issues that have been important to us, not only the issue papers, but I would say subjects that have been important to us.

So, let's see, is it possible to bring that up?

MS. MERSFELDER-LEWIS: Hey, Julie, this is Lynne. Could we pause on that and do the public comment period right now and come back to that because we -- actually that was scheduled for after the public comment.

CO-CHAIR THOMAS: Okay.

MS. MERSFELDER-LEWIS: And we're already over the public comment period. So if we

can come back to you.

CHAIR SAADE: Okay. We would like to invite written and public comments at this time. Lynne, are there any public comments for us to address at this time?

MS. MERSFELDER-LEWIS: Yes. So, this is Lynne Mersfelder-Lewis. I'm the program manager, and I will read you -- we have seven public comments.

And let me just, we'll get that up, two seconds. Virginia has a slide of some of them, or most of them, to put up. So just give us a second.

Hey, Virginia, would you put up that slide, pretty please? Okay. Jon Dasler gave us the biggest, the most comments.

And he -- well, also, I just also want to mention all the public comments will be put into the meeting report as well and we will get back to people after the meeting with whatever we can get back to you on.

So, Jon Dasler said, in Fiscal Year

2021 NOAA Congressional budget justification we noted the following. Under Navigation, Observations and Positioning Direct Obligations, there is an increase for in-house navigation observations and positioning of $2.8 million over the Fiscal Year 20 enacted and a decrease in hydrographic survey priorities contract by $5.1 million over the Fiscal Year 20 enacted obligation.

We also noted the following in Exhibit 13, schedule and milestones. Fiscal Year 21 there are three bullets and Fiscal Year 22 to 25 there are three bullets.

The -- he notes the deliverables. There are two bullets and he gave a table that one of the deliverables is collect an additional 150 square nautical miles of hydrographic survey data for a total of 2,429 square nautical miles in priorities annually starting in Fiscal Year 21.

I'm sorry, could you go back, Virginia? We applaud NOAA's outreach effort and

used the external data to analyze priority areas.

While we commend for the outreach efforts in support of contracting and agree with the increase to support in-house operations to meet the needs of the nation, we question why an additional contractor is needed when the contracting budget was reduced by $5.1 million from $32 million Fiscal Year 20 enacted to $26.9 million in Fiscal Year 21 estimated.

Many current contractors have capacity through subcontractors that is currently not being tapped. Can NOAA explain the rationale behind the desire for an additional contractor when budgets are being cut and there is adequate capacity among the existing seven contractors? This in effect undermines the capacity and expertise of the existing pool of contractors.

So, Jon, we appreciate your comment and we will get back to you offline on that. It is a very long comment and also neither contracting or budgeting are in the purview of HSRP. But they are in the purview of NOAA.

And then I want to also mention the other comments that we had. Rada Khadjinova, thank you very much. She says, Fugro is a global geodata company. We acquire, analyze and provide advice using geodata in Alaska and other regions. Our work includes research projects for resource and land management agencies.

In the course of our research, we review all existing data, including bathymetry and backscatter, both water column and seafloor data. NOAA hydrographic data uses much beyond accurate knowledge of the water depth.

For instance, backscatter is valuable to characterize seafloor habitat and to make resource assessments: mineral, including critical minerals, hydrocarbon, biological, et cetera, among many other uses. I want to express support for NOAA collecting backscatter data along with bathymetry and to continue to do so in this -- in the future.

Thank you, Rada, for your comment. That is something Ed Saade has mentioned to us

many times.

Denis Hains asks, do you insure international linkages and how are interfacing -- how are they interfacing internationally to ensure smooth transition with Canada, especially for the Great Lakes and Mexico?

Thank you, Denis. We will try to get you an answer on that after, if we can.

Sean Murphy, thank you for the invite to the meeting. I am interested in creating a multiple boat USV solution for swarm bathymetry that is driven by AI.

I have previously accomplished a swarm USV survey. I monitored and controlled all sensors and USVs. But I believe the next step is for an AI to adjust survey lines and automatically post process the data that I collect. I heard at the beginning of the presentations about a cache of bathymetric data that could be made available to companies.

So, we've already actually put him in touch with somebody to help with that answer.

But -- that is Sean Murphy. He's out of Florida. He's with the business unit of the subsurface applications.

Jill, you have unmuted somebody and there is an echo and I can hear my voice.

Colleen Roche asked two questions. She said as -- this is the fifth comment -- as visibility/fog is a big issue during the spring and fall on the Hudson River, are there any plans to install sensors on the upper Hudson? I believe that's a question for CO-OPS and we will put you in touch with CO-OPS.

Captain Scott Ireland, Colleen passed from Captain Scott Ireland also about the Hudson River.

Good afternoon, my name is Captain Scott Ireland. I'm the senior pilot with Hudson River Pilots Association. Back in '17 NOAA undertook a survey -- a resurvey of the Hudson River. As the existing soundings are a hundred-plus years old, we are anxious to see the new surveys published. When might that happen?

We will get back to Captain Ireland and Colleen Roche about the timing for that. Thank you for your comments.

Edward Albada asks, what is the -- this is the seventh public comment -- what is the best mechanism for private entities that have emergent remote sensing, satellite, and hyperspectral imagery-derived bathymetry technology to get involved with NOAA's initiatives?

And, Edward, thank you for your comment. We will get back to you with a contact after the meeting.

That's all I have, Ed, for right now. Galen, I don't know if any more came in while we were, while I was talking.

CHAIR SAADE: Okay. That's a good list. I guess I would like to ask Dr. Jacobs if he has any comments before he has to depart the meeting -- if you want to say anything.

DR. JACOBS: This has just been an excellent discussion. It's been really

fascinating for me to see some of these PowerPoints.

Really interesting questions just coming up. I just want to say I appreciate everyone's dedication and hard work and your guidance. Even despite the current pandemic and everyone having to telework, I think we're moving forward on our mission. I've been texting Admiral Gallaudet over the last hour and just want to pass along his praise and thanks to everyone.

Just let me know how my team and I can help and really look forward to seeing all of you in Hawaii.

CHAIR SAADE: Okay, great. Thank you. Stay safe, stay healthy and we'll catch you next time. Thank you.

RDML SMITH: Thank you, sir.

CHAIR SAADE: Lynne, I'm going to hand it back to Julie, okay.

CO-CHAIR THOMAS: All right. So, you know, I see Ed Page on. Why don't we do the

Arctic Working Group update then with Ed on? And, Lindsay, we'll do the Tech one next.

MEMBER PAGE: Sure. In the interest of saving time and whatever I'll go real quickly.

First of all, we came up with a strategic plan about six months ago when we basically dusted off the strategic plan that my predecessor, Captain Lawson Brigham, did when he was on the HSRP, another Coast Guard guy that -- we go back, I guess 50 years. We've known each other for about 50 years now.

So, anyhow -- and we just kind of updated. And so, strategic plans for the last four to six months. So, the strategic plan that came six months ago is still relevant. Things are changing in the Arctic as far as obviously the climate change issues, but also the fact that the price of oil and the interest in offshore exploration and other issues are very dynamic.

The Russians are accelerating and increasing their maritime activity. But the maritime activity we've seen for the last several

years is pretty much stagnant. So, about 500 vessels go through the Bering Strait each year. And there's still speculation that over time the Arctic will be more of a thoroughfare.

And -- but the punch list that we identified in the strategic plan, we looked at it and it's still very relevant as far the use of technology and surveying and tools to aid safe, efficient, environmentally-sound maritime operations.

And evidently, the President read it because that memo on charting the Arctic came out. So, he read our position paper. So, that's pretty impactful. So -- I think we'll leave it at that. Success. Victory.

CO-CHAIR THOMAS: Okay. Thanks, Ed. Lindsay, do you want to give an update on the Working Group?

MEMBER GEE: Yes. And it's not much of what we've done, but what we plan to do, I guess. Something now we haven't really directly worked on -- the particular issue papers in the

last six months, but I think with that general input into a number of the meetings and issues and it's kind of stating the obvious now that technology is kind of the new infrastructure across those things.

A couple of the areas that I think you'll see of interest, the autonomous systems or unmanned systems, a big part. And I think what I would like to address and see addressed is how -- the impact they have on, really, the operations.

And something we're seeing and how industry is adopting some of that technology as well. We've been mostly focused on the nice toys and the yellow boats, and orange boats now, and the systems and this kind of software.

What I want to -- I think it's something -- it's time to address now is kind of the people and the resources of how that might be addressed. We're trying to do more with what we have. But it's probably not the same people that are going to operate the newer systems then it was. And I think we saw that with technology.

I'm an old guy. So, I saw that with technology through the years from the cartographer and the seamen to where we are now with digital systems.

The other thing I think would be interesting to address with the systems is the way that business has adapted to them now and industry. And we're seeing they have a different purpose when they take technology out.

And we're seeing going from those both the platform to the systems now we're seeing -- and the services of delivering surveys we're seeing, for the unmanned systems, we're seeing data delivered. And I'm interested to pursue that further.

The other thing -- Admiral Smith mentioned the IOCM and the update of the Ocean Coastal Mapping Integration Act. And we had a meeting before that and I think the Technology Group will take the lead on that.

The final thing I would say knowing we've got new members now, I think it's probably

time -- a good time to review the membership of the group and see if others are interested, and hopefully we can address that in another session, in our engagement session.

CO-CHAIR THOMAS: Great. Thank you, Lindsay. I think we have the matrix prioritization to go to now. And this is our ongoing list of topics that we would like to talk about.

Dave Maune, did you want to still make a comment here about IOCM, Alaska, et cetera?

MEMBER MAUNE: Okay. Admiral Smith talked about the Presidential Memorandum, Section Number 2, and Nicole LeBoeuf talked about Section Number 3.

Both of those are going to be having strategies developed that I think the HSRP will want to review when it comes in. It isn't clear to me whether Section 4 is going to have a strategy for mapping (audio interference).

I had already been working on the Alaska coastal mapping strategy because they've

been having coastal summits up there for years. And last September I already had a -- was drafting an issue paper on the Alaska coastal mapping strategy. But I wanted to do it and work in coordination with what the people of Alaska were developing for their strategy. And then, lo and behold, the Presidential Memorandum came along and really made it easier for us.

And so, like Nicole said, we had a head start on the coastal strategy. Ashley is taking the lead on that now and I'm anxious to see what it says. But I certainly will be looking forward to somebody to help me with an issue paper or other approach to addressing Section 3 on the Alaska Coastal Mapping Strategy.

And I think that Julie and I will be looking for volunteers to look into strategy number two on the EEZ part because I think we will have at least two issue papers or at least two topics for us to review.

And for all these strategies under development, the HSRP should look critically on

those documents to see how they align with our current thinking as best we can, by issue papers and other means, and to determine if they have specific recommendations for improvement.

And so, in order to do that we will be looking for volunteers from the HSRP Members to say look, I'm interested in that topic and I would like to be part of this movement.

So, yes, I still plan to proceed with something and addressing. But I have to wait for the Alaska Coastal Mapping Strategy to be officially approved by the White House.

CO-CHAIR THOMAS: Okay. Thanks, Dave. So, if you will note that Row Number 1 of the matrix, I actually did add in IOCM here. And this is really very preliminary, is what I want to say.

We can adjust this to include the Presidential Memo, to however we want for the wording. I suggest that we send this matrix around and people can adjust any wording here. But we might -- if you scroll down there is a

section where we talk about, Dave and -- I think it's Row 19 now. And we might roll that all into the mapping row.

And so these are all ongoing projects that we have. You'll see that there are two -- you can keep scrolling down because we're not really going to have time to go through all of these projects.

But I wanted to point out that in Hawaii, there were two topics we were going to address, the relative sea level and incorporating authoritative sources into the hydrographic products.

And these we still plan to address when we have our meeting in Hawaii, then we will still address those. And we will probably also get the IOCM or the presidential mapping campaign, some integration of the mapping discussion into this in Hawaii also.

So, I'm not going to go through any more of this priorities matrix. I won't go around in the interest of time to everyone. But

we will be doing closing remarks, so if you do have something specific for the priorities matrix, why don't you mention it at that time. And also, we will be getting -- we would like to include an update to this with the administrative letter.

So please, when we send it around again, make sure that you get in there any comments or edits that you would like.

And, Ed, before turning it back to you, I know that Anuj also has a comment that he would like to make regarding the vis sensors. Is this a good time to take that now?

Let's see -- Anuj, are you there? Are you self-muted?

MEMBER CHOPRA: Yes, I am unmuted. Thank you so much. Thank you so much, Julie. I wanted to highlight the requirement or the need for good management of restrictive visibility and precise navigation.

We just completed a very tough season of fog in the U.S. Gulf. And it has had huge

economic impact. They're shutting off marine operations, channels, entries, because of fog, and so it just brings it back to the forefront that if we have a solution, and if we have the technology available, to utilize that technology so that ships can navigate in fog safely and commerce can continue.

Wanted to highlight that. So, that's -- I would like you all to consider that. Thank you.

CO-CHAIR THOMAS: Yes. Thank you, Anuj. And we did actually put that in as one of our recommendations in the letter last time.

Maybe the place now so that we can follow this and track it is to actually put a row in our priorities matrix and we can just bring in the management of the fog sensors also as a topic.

And so when we send this priorities matrix around, feel free, Anuj, to either give me the verbiage and I can add it in, or if you want to add it in too that would be great. But I'm

comfortable with handling it that way if that's okay.

MEMBER CHOPRA: Awesome, thank you.

CO-CHAIR THOMAS: Okay. Ed, back to you.

CHAIR SAADE: Hey, great wrap-up to the -- exceptional job. We're only about seven minutes behind schedule all of a sudden. So, appreciate (audio interference) -- reverse alphabetical and again let's -- it was a really great meeting. Okay, Gary, if you can go first, any comments you would like to make, please?

MEMBER THOMPSON: Great meeting. Thanks for the input on the issue paper and we'll work on getting those modifications made so that we can get it sent out.

CHAIR SAADE: Okay, thanks. Julie, back to you. You're back on.

CO-CHAIR THOMAS: All right. Wait just a second. I'm going to make sure my webcam -- okay. Yes, I agree it has been a really interesting meeting, considering we did this all

virtually.

And you know there were so many things that I was interested in -- I'm just looking at my notes also while I'm talking.

But I was really glad to hear some of the points that both Admiral Smith and Nicole LeBoeuf brought up during their discussion of the mapping and things across, the efficiencies across agencies, the standardization protocols, the partnerships.

These are all things that have been near and dear to my heart, and things that we've worked really hard for over the years to try to standardize some of these products. And it's interesting that the shallow less than 200 meters is still always the most difficult to map.

And I am always interested in that update by Larry and Andy as far as their nearshore remote AUVs and ASRs and communication there. That sounds like a really powerful tool in the future.

And let's see, it's the -- Juliana's

update on datums was really interesting. I'm impressed there's even 81 percent of the U.S. that has been -- data have been collected.

So I look forward to following the updates on there. And that's all I'm going to talk about. Once again, we will be circulating both the priorities matrix and the administrative letter for your input. Thank you all very much.

CHAIR SAADE: Thank you. Ed Page?

MEMBER PAGE: Aloha. That's all I have to say. Let it go.

CHAIR SAADE: Okay. Anne McIntyre, now you've got the floor.

CO-CHAIR THOMAS: Anne might be gone. She sent a note saying she had to leave for 30 minutes and that was not too long ago.

CHAIR SAADE: Okay, thanks. Dave Maune, anything else you want to -- you're muted, Dave. You're muted.

MEMBER MAUNE: Okay, can you hear me? Okay. I just want to remind people that I'll be looking for volunteers to work an issue paper or

something like that when that Section 2 comes out on that from the EEZ.

People that are interested in that topic should let Julie and me know because we would probably like to put you in charge of putting together our position on that. That's all I have. Thank you.

CHAIR SAADE: Ann Kinner?

MEMBER KINNER: Am I there? There we are.

CHAIR SAADE: Yes, go ahead.

MEMBER KINNER: Lots of stuff to think about. And I'm just curious and -- it's a note I put down and don't know quite where to find the answer.

But the use of all these autonomous vessels underwater and on the surface, I had the question come up to me maybe a month and a half ago from somebody in the Navy who wanted to know what the new COLREGs were with respect to these things.

And as far as I know there aren't any.

But I would think there would have to be something. And I know the comment was made that these are addressed in the COLREGs some place. But I haven't been able to find it myself, whether it's specific lights or day shapes or communications to vessels in whatever area operations are going on.

So -- and it's something that's come up as a safety issue in certain areas too, with all these things running around with nobody actually onboard looking out the window.

Can somebody point me at COLREGs that relate to this or tell me if this is something that the -- I am always going to eventually deal with?

CHAIR SAADE: I think it's safe to say it's long answer and we'll have to address it later. It's a very long response. It will be a very long response.

MEMBER KINNER: You were a little garbled.

MR. MURPHY: I can assist and provide

insight towards that if anybody is interested in that. This is Sean Murphy from Maritime Tactical Systems. We make USVs.

CHAIR SAADE: Okay, Ann, did you hear that?

MEMBER KINNER: Not all of it, no.

CHAIR SAADE: Okay, we'll get back with you. I'm going to move on. Ed Kelly?

MEMBER KELLY: Just an observation, Hawaii is a great place, but the commute was much better for this meeting. The other thing is I really continue to be fascinated and I'm very glad to hear reports from Rich and the guys up at UNH about the continuation with the technology.

We definitely need to move toward increased technology in AI. Who knows, we might actually defeat the government and actually end up being faster, better, and cheaper. That's it.

CHAIR SAADE: Okay. Deanne?

MEMBER HARGRAVE: Thanks, Ed. Yes, so I guess my main comment was to commend NOAA on the interagency coordination that continues to

happen. I think that's just really key. It's key for industry in order to make things go smoothly. So that was my main takeaway other than, of course, being a technology person, I always like the technology presentation. So I appreciate everything. Thanks, Ed.

CHAIR SAADE: Lindsay Gee? Lindsay Gee?

MEMBER GEE: Hi, Ed, sorry. Yes, I think the thing to come away with is I'm really looking forward to seeing the strategy papers and whatnot, and obviously that interagency coordination is going to be required to implement those.

And just to Dave Maune, I think the note about the IOCM getting that legislation renewed, and the strategy too, go together. So, I think I already put my hand up for the other one so I think we're happy to run that from the Technology Working Group if you want.

I do have other things I'm interested in for both Julie and Rich, I guess about the

VDatum and the National Reference Frame and how that's -- I'm interested to know how that's progressing out into the Pacific. But that's all I have, thanks.

CHAIR SAADE: Thanks. Nicole? Nicole Elko?

MEMBER ELKO: So, thank you. This was an interesting meeting. I learned a lot. I want to thank Lynne in particular for providing such great materials. I was really able -- even when I was getting distracted sometimes, I was able to keep myself focused and stay on track. The priorities matrix is really helpful.

So I look forward to continuing learning more about that. There are some elements on it that weren't discussed that I'm interested in. So I will look forward to learning some more about that.

Interagency collaborations in particular are something that are of great interest to me. I didn't mention this morning or earlier today -- I guess it depends on where you

live -- in my introduction that I also work with a new program called the U.S. Coastal Research Program, which is just that.

It's an interagency collaboration that also includes academics and stakeholders. And I can start to see a lot of similarities here or at least areas of overlap in collaboration.

So really looking forward to seeing you all in person soon and continuing this good work. Thanks for having me.

CHAIR SAADE: Sean, if you can hear me, Sean Duffy?

MEMBER DUFFY: All right. So, I can hear you and hopefully you can see the orca that I received several of after the party in New Orleans.

I made a comment that I wanted one in my pool. And HSRP, let me tell you, you delivered. I got a bunch of whales. I've towed one behind my kayak in the swamp and something nipped it. I'll hold to it was a gator, but I'll leave it at that. Well done. Of course I have

to say that my wife woke me up this morning with we're supposed to be in Hawaii. So I'm sure that everybody had those pains.

I think we did a great job covering a lot of material. There's no substitute for being in person. I look forward to working on the director's paper with Julie and to trying to help put, make some sense of some of the things and I always look for the humor and time to keep things going.

So with that, my whale's name is Tua after our Hawaiian quarterback from the University of Alabama. And he can be seen regularly in our pool. Thank you, signing off.

CHAIR SAADE: Anuj?

MEMBER CHOPRA: Good afternoon. Thank you so much. Really enjoyed the presentations. I'd like to commend NOAA on the progress made especially in these difficult times, especially about -- really liked the comment about taking care of personnel, NOAA personnel, in these COVID-19 times made by Nicole.

I strongly support the push for tech and AI and to promote that into the mainstream. And last but not the least, want to commend Lynne and her full team for making this a virtual meeting and making it successful and make us work for it.

So, awesome. I think it went seamlessly. So thank you for the opportunity.

CHAIR SAADE: Thank you. Qassim, you're up, Qassim.

MEMBER ABDULLAH: Thank you. This is my first meeting and I think it's a great meeting, actually. And again, I just reiterate what Anuj said. Would like to thank Lynne and her team to make it happen online. There are a few things that I would like to -- Lindsay mentioned, like, for the membership of the group.

I would like to be a member of the Technology Working Group in the future. And I would like really to be involved with the restricted visibility on the table, the navigation through fog, you know.

I think we can bring a lot to it definitely between GIS and bathymetry. I have good experience with that and -- with something for that. And I would like to commend Admiral Smith for what they did on the Presidential Memo.

I will be looking forward to see what the White House responds because it seems like we are behind on mapping shoreline. There is a lot of work needs to be done. So we'll be looking forward for that. Thank you. That's it, Ed, for me.

CHAIR SAADE: Thank you. Dr. Larry Mayer? Larry? There he is.

MS. STODDARD: It looks like Larry might be self-muted.

DR. MAYER: I think that fixed it, has it?

CHAIR SAADE: Good.

DR. MAYER: Great meeting. Anuj and Qassim stole my thunder in terms of thanking the NOAA staff for making such a difficult virtual meeting happen relatively seamlessly. I think

that was a tremendous job.

I think, like many of us, I'm very excited about the ocean mapping strategy and waiting for that to come out. And as was reported, both at the White House summit and again here, the ocean and ocean mapping are really having a moment in this country. And it's time that happened and I think we're at the forefront of it and I think that's great.

CHAIR SAADE: Thanks, Larry. Nicole, do you have any more comments for us, Nicole?

MS. STODDARD: Ed, if you're talking about Nicole LeBoeuf, I believe that she had to leave and she is no longer on the call.

CHAIR SAADE: Okay. Rich, over to you.

MR. EDWING: All right, can you hear me?

CHAIR SAADE: Yes.

MR. EDWING: I've got a green here, so. No, I think we packed a lot into the meeting, you know, for a short meeting. Maybe

the next best thing to being in Hawaii, right?

And I found the presentations interesting and really look forward to seeing everybody in person at the next meeting.

CHAIR SAADE: Thanks. Juliana?

MS. BLACKWELL: Just want to thank you all for your continued enthusiasm and support for our offices. And again, another kudos to the staff for making this all work. Thank you.

CHAIR SAADE: Andy, you're up.

CAPT ARMSTRONG: All right. Thanks, Ed. Again, I think a great meeting. And I guess I'm coming -- I'm looking forward to the HSRP developing this AI topic and particularly identifying associated research needs and opportunities with that.

CHAIR SAADE: Okay. I think you guys can hear me. I'm going to wrap up and let Shep do the words. I wanted to thank Jill Stoddard, Amanda Phelps, Christine Burns, Galen Scott, Virginia Dentler and the entire team.

It went off really well. A lot of

hard work. And, Shep, I want to say publicly we're going to miss you at the next meeting, but best to you in whatever comes next. So you can take it from here, thanks.

RDML SMITH: Thank you, Ed. The HSRP has been a really fun part of my suite of duties here as the coast survey director. And I'm actually quite proud of what we have all done together in the last few years.

I think this, the health of this -- of the HSRP itself is stronger than it's been in some time. The engagement is outstanding. Judging from the interest in this meeting, this is a very relevant set of topics and the place to discuss them. And so, I really want to congratulate you, Ed, on your chairmanship and your predecessors.

I saw Bill Hanson was on the phone earlier. I don't know whether he's still on. But -- and all of the really great Members that we have had and that we have now.

And so, I also, I think I'm really

pleased that you all remember from meeting to meeting some things that have long-term thorny implications. And, you know, interagency coordination is hard.

We work really hard at it. And it's really critical and really is -- underlies our credibility in our -- in the continued relevance of our programs.

And on the fog and I'm glad you raised that again, Rich raised it on the observation side. But when we originally talked about it we talked about three things, observations, predictions, and scales, and in forms that were relevant for navigation and also operating in it.

And so I'm really glad that Qassim raised the subject of what it takes to operate safely in sort of an instrument mode of precision navigation. And that takes a lot of other things in addition to the knowledge of the fog.

So, thank you all. And I'll just reiterate thanks to the staff. And I'll particularly call out Jill Stoddard who -- this

is her first HSRP and she got roped into being the orchestrator of the entire thing.

So deciding who could talk when and getting it all set up and conducted seamlessly. So it's very hard, and this is the biggest meeting we've ever done like this. And so, thank you, Jill, and congratulations on pulling this off. And back to you, Mr. Chair.

CHAIR SAADE: I would like to just tell everybody that one of our former panelists, Dr. Larry Atkinson sends his warm regards. He's been stabilized and says he misses the HSRP members and mission. And maybe he even watched. I don't know, but hopefully --- (audio interference). Our best wishes to Larry as well.

Before I sign off, Lynne, I'll just ask should I read Admiral Gallaudet's note?

MS. MERSFELDER-LEWIS: I'm sorry, Ed. Could you repeat that? You were garbled.

CHAIR SAADE: I think I know the answer. I was going to ask you should I go ahead and read from Admiral Gallaudet's note?

MS. MERSFELDER-LEWIS: Yes, actually if -- let me just pull that up. I think I'm going to read that for you because you're very garbled.

CHAIR SAADE: That's fine. Okay, go ahead.

MS. MERSFELDER-LEWIS: Admiral Gallaudet, we tried valiantly to get him on but he was, we couldn't control his phone from our webinar. So he has been, like, a super strong supporter of the HSRP over the years that he's been with NOAA.

And he sent us a bunch of comments. And we'll put this also into the report. But he says, thank you all, both HSRP, NOAA employees, and partners for advancing our hydrographic capabilities and services over the years.

That is what gave the White House confidence in getting the Presidential Memorandum signed and that is what is ensuring that -- NOAA and USG in applying the Ocean S&T to benefit the American people.

It also delivered in a big way in our COVID-19 response, where Office of Coast Survey surged support to USNS Comfort's deployment to LA to establish a safe navigation exclusion zone. I think that was also in New York. I know we had a safe navigation exclusion zone.

We are grateful for your efforts during this meeting to review and recommend how we apply emerging S&T and how we are implementing the Presidential Memorandum.

For our unmanned systems, we are surging unmanned this week and in May to mitigate the collection gap created by having our ships and aircraft halt their operations.

For this, work is being enabled by our new unmanned program, the Fiscal Year 20 budget and appropriations growth for the unmanned systems. It will serve as a remarkable validation for our NOAA unmanned strategy, the executive order on AI and the CENOTE Act, which you guys might know is C-E-N-O-T-E, and that's referencing geospatial requirements.

Lastly, I look forward to seeing you all in person again. I have thoroughly enjoyed our past meetings, Miami and Juneau were especially memorable.

And Nicole was right. You are one of the funnest federal advisory committees that we work with. Tim Gallaudet, PhD, Rear Admiral U.S. Navy, Retired, Assistant Secretary of Commerce for Oceans and Atmosphere, and Deputy NOAA Administrator.

We so thank you for your comments, generous comments. And that's all I have, Ed.

CHAIR SAADE: Okay. I'm garbled up. I'm going to call the meeting closed. Thanks, everybody. Great job, lots of great information. Stay healthy and we'll all see each other soon.

(Whereupon, the above-entitled matter went off the record at 4:29 p.m.)

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C E R T I F I C A T E

This is to certify that the foregoing transcript

In the matter of: Hydrographic Services Review Panel

Before: US DOC/NOAA

Date: 04-28-20

Place: teleconference

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

Neal R Gross

Court Reporter