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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WEDNESDAY
SEPTEMBER 23, 2020

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

HSRP MEMBERS PRESENT

EDWARD J. SAADE, HSRP Chair
JULIE THOMAS, HSRP Co-Chair
DR. QASSIM ABDULLAH
CAPTAIN ANUJ CHOPRA
SEAN M. DUFFY, SR.
DR. NICOLE ELKO
LINDSAY GEE
EDWARD J. KELLY
CAPTAIN ANN KINNER
DR. DAVID MAUNE
CAPTAIN ANNE MCINTYRE
CAPTAIN (ret. USCG) ED PAGE
CAPTAIN SALVATORE RASSELLO

GARY THOMPSON

NON-VOTING HSRP MEMBERS

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

NOAA LEADERSHIP PRESENT

REAR ADMIRAL SHEP SMITH, HSRP Designated Federal Official; Director, Office of Coast Survey, NOS
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
NICOLE R. LEBOEUF, Acting Assistant Administrator, NOS

NOAA STAFF PRESENT

VIRGINIA DENTLER, Center for Operational Oceanographic Products and Services
LYNNE MERSFELDER-LEWIS, HSRP Coordinator
PAUL TURNER, Office of Coast Survey

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

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

12:48 p.m.

CHAIR SAADE: Okay. We are going to officially kick off the September 23rd, 2020 HSRP meeting virtual. I'll go ahead and start the meeting.

I'm Ed Saade. I'm the President of Fugro USA, and I am also the co-chair of the HSRP. Member bios are in the advanced materials on the web, and we'll go ahead and dispense with reading speaker bios at this time.

I'm inviting the HSRP members and the Office Directors and NOAA leadership to do very short intros. So could you please provide your name, your organization, and job title as we go through the list alphabetically by last name? And we will start with Dr. Qassim Abdullah.

MEMBER ABDULLAH: Hello, everyone. My name is Qassim Abdullah. I'm Vice President and Chief Scientist with Woolpert. I'm wearing the hat of academia. I teach at Penn State and UMBC. I'm located in Washington, D.C. area. I report

to our office in Arlington, Virginia. I will be looking forward to a full discussion with all of you.

CHAIR SAADE: Thanks, Qassim.

Next up is Captain Anuj Chopra.

MEMBER CHOPRA: Thank you, Ed. Thank you very much. Good morning, good afternoon to all of you. My name is Captain Anuj Chopra. I'm Vice President of Americas for RightShip. I'm privileged to lead the Americas team for the hemisphere. I'm based out of Sugarland, Texas. Thank you.

CHAIR SAADE: Thank you. Sean Duffy, you're up.

We'll come back to Sean. And next up is Dr. Nicole Elko.

Okay. We'll come back to Nicole. Next up is Lindsay Gee.

MEMBER GEE: Thanks, Ed. My name is Lindsay Gee. I'm the manager of mapping and science operations for the Ocean Exploration Trust. I'm currently in New Hampshire supporting

Exploration Vessel Nautilus. It's offshore Washington coast right now.

CHAIR SAADE: Thanks, Lindsay.

Ed Kelly. You're muted.

MEMBER KELLY: Good afternoon. Now I'm unmuted. My name is Ed Kelly. I'm the Executive Director of the Maritime Association of the Port of New York and New Jersey. We act as a Marine exchange tracking all vessel operations and data, and we represent the advocacy for the commercial and industrial maritime industry in the northeast area. Thank you very much.

CHAIR SAADE: Thanks, Ed.

Captain Ann Kinner, you're next.

MEMBER KINNER: Good morning. I'm Captain Ann Kinner, owner of Seabreeze Books and Charts in San Diego, and I'm also Chair of the San Diego Harbor Safety Committee.

CHAIR SAADE: Thanks, Ann.

Dave Maune.

MEMBER MAUNE: Hi. I'm Dr. Dave Maune with Dewberry Engineers headquartered in Fairfax,

Virginia. I'm an Associate Vice President there and specialist in remote sensing.

CHAIR SAADE: Thanks, Dave.

Captain Anne McIntyre. You might be muted, Anne. Anne, can you hear us? I can see you.

MS. DENTLER: Anne, it looks like you're self-muted.

CHAIR SAADE: Go ahead, Anne. We'll come back to Anne.

Captain Ed Page. I don't see Ed on the list yet.

MEMBER PAGE: I'm muted. Okay. Hi, Ed Page. I'm Executive Director of the Marine Exchange of Alaska located in Juneau, Alaska. Thank you.

CHAIR SAADE: Thanks, Ed.

Julie Thomas.

CO-CHAIR THOMAS: All right. Julie Thomas. I'm actually co-chair of the HSRC. I'm retired from the Scripps Institution of Oceanography where I was Program Director of the

Southern California Coastal Ocean Observing System and Coastal Data Information Program, CDIP. And I'm located in Encinitas, California, north of San Diego. Thank you and welcome to all.

CHAIR SAADE: Thank you, Julie.

And Gary Thompson, please.

MEMBER THOMPSON: Good afternoon. My name is Gary Thompson. I'm with North Carolina Emergency Management. I'm the Deputy Risk Management Chief and also Chief of the North Carolina Geodetic Survey and I'm located in Raleigh, North Carolina.

CHAIR SAADE: Thanks, Gary.

So Sal Rassello, if you're online there, could you go ahead and speak?

MEMBER RASSELLO: Good morning to everyone, or good afternoon. My name is Sal Rassello. I am the ship's captain and just retired as Nautical Director from Carnival Cruise Lines in Miami. At the moment I am in Croatia, so hi everyone.

CHAIR SAADE: Thanks, Sal.

Okay. I'm going to go back to Sean and Nicole and Anne and Ed. Ed's here. Ed's okay. If you all could self-mute before you try and speak, please.

Sean, you're up.

MEMBER DUFFY: I'm here. Okay. Sean Duffy, Big River Coalition, Executive Director, a maritime trade organization based in New Orleans along the Mighty Mississippi River.

CHAIR SAADE: Thanks a lot, Sean.

Dr. Nicole Elko.

MEMBER ELKO: Hi. Good afternoon, everyone. My name is Nicole Elko, and I'm the Science Director of the American Shore and Beach Preservation Association based in Folly Beach just outside of Charleston, South Carolina.

CHAIR SAADE: Thanks, Nicole.

Captain Anne McIntyre.

MEMBER McINTYRE: Hi, yeah. Anne McIntyre. And actually, my bio on the slide there is wrong. I've retired from the Columbia

River Pilots, and I am now the Business Director at the San Francisco Bar Pilots and coming to you today from Pier 9 in San Francisco.

CHAIR SAADE: Thanks, Anne.

I would like to have the four non-voting members of the HSRP and NOS and NOAA leadership do self intros in alphabetical order. So that will be Juliana Blackwell, Rich Edwing, which are analysts, office directors, and Dr. Larry Mayer and Captain Andy Armstrong who serve as the co-directors of NOAA-UNH Joint Hydrographic Center.

So, Andy, if you want to go first, please.

CAPT ARMSTRONG: Yes. Hello, everybody. I'm Andy Armstrong. I'm the NOAA Co-Director at the NOAA University of New Hampshire Joint Hydrographic Center here in Durham, New Hampshire.

CHAIR SAADE: Thanks, Andy.

Juliana, please.

MS. BLACKWELL: Hello, everybody. I

am Juliana Blackwell. I'm the Director of NOAA's National Geodetic Survey, and I'm headquartered out of Silver Spring, Maryland.

CHAIR SAADE: And it looks like a nice day.

Rich Edwing.

MR. EDWING: Hi. Good afternoon, everybody. I'm Rich Edwing. I'm the Director of the Center for Operational Oceanographic Products and Services, also headquartered out of Silver Spring, Maryland.

CHAIR SAADE: Thank, Rich.

Is Dr. Neil Jacobs online yet? We'll come back to Dr. Jacobs.

DR. JACOBS: I'm here. Can you hear me?

MEMBER CHOPRA: Great timing. Go ahead, please.

DR. JACOBS: Neil Jacobs, Acting NOAA Administrator.

CHAIR SAADE: Welcome.

Nicole LeBoeuf.

MS. LeBOEUF: I'm here. I'm the Acting Assistant Administrative of the National Ocean Service. Happy to be here.

CHAIR SAADE: Thanks, Nicole.

And Dr. Larry Mayer.

DR. MAYER: Weird that I'm never at the end of the alphabetic. But I'm Larry Mayer. I am the UNH Co-Director of the Joint Hydrographic Center of the University of New Hampshire and I'm sitting in Lee, New Hampshire right now.

CHAIR SAADE: Okay. Thanks everyone. I guess we are technically a couple minutes early but I'm going to go ahead and hand it over to Shep so he can fill a little void here before we have the official kickoff.

Admiral Shep Smith, please take it from here.

RDML SMITH: Thank you, Ed. Yeah, Shep Smith. I'm the Director of the Office of Coast Survey at NOAA based also out of Silver Spring, Maryland. Since March I've been working

from home in Maryland nearby. And today I'm coming to you from an undisclosed location for this meeting.

Chairman Ed Saade, Co-Chair Julie Thomas, NOAA Administrator Neil Jacobs, Assistant Administrator Nicole LeBoeuf, NGS Director Juliana Blackwell, CO-OPS Director Rich Edwing, UNH Joint Hydrographic Center Co-directors Dr. Larry Mayer and Captain Andy Armstrong, HSRP members, Hill staff, stakeholders, partners and colleagues, thank you all for joining us for a condensed two-day -- two half-day virtual meetings for the HSRP.

The Hydrographic Services Review Panel is governed by the rules of the Federal Advisory Committee Act. The Federal Advisory Committee Act defines an advisory committee as any committee, board, commission, council, conference, panel, task force, or other similar group that dispenses advice or recommendations to the President of the United States and excludes bodies that also exercise operational functions.

They are a provisional bodies and have the advantage of being able to circumvent bureaucracy and collect a range of opinions.

In drafting the Federal Advisory Committee Act, legislators wanted to ensure that advice by the various advisory committees should is objective and accessible to the public by formalizing the process for establishing, operating, overseeing, and terminating the committee.

In particular, the act restricts the formation of such committees to only those which are deemed essential, limits their powers to provision of advice to officers and agencies in the executive branch of the federal government, and limits the length of term during which any such committee may operate.

Further, FACA, the Federal Advisory Committee Act, was an attempt by Congress to curtail the rampant cloakroom discussions that had become prevalent in administrative discussions.

These cloakroom discussions are masked under titles like task force, subcommittee, and working group meetings which are less than full FACA meetings and so they do not have to be open to the public. FACA declared that all administrative procedures and hearings were to be public knowledge.

I had the privilege of working with Dr. Alan Leonardi from the Office of Ocean Exploration for the past year in developing the National Ocean Mapping Exploration and Characterization Strategy released by the White House in June.

Along with Alan and Dr. John Haines from USGS, we now share the NOMEC Council charged with implementing the NOMEC strategy. We're committed to being as inclusive as possible in the development of the implementation plan with input not only from federal agencies, but also from the academic, philanthropic, and commercial sectors and end-user groups.

There are two existing federal

advisory committees that advise NOAA on hydrographic services, the HSRP, and ocean exploration, the Ocean Exploration Advisory Board. We'll be using these committees as one structure for gathering public input as we develop the implementation plan. And that's one of the agenda items on the meeting today and tomorrow.

We've heard from many in the public that we need to gather public -- we need to gather input earlier in the process of developing government policy rather than simply the pro forma public comment period on a completed policy document. We're doing exactly that today, which is why the comment period is so loosely structured.

We're not keeping the implementation plan hidden; it doesn't yet exist and will be informed by your comments during this meeting. There will be other opportunities to engage in the next few months, and I'm committed to ensure that the eventual governance structure for the

broad NOMEC program will have ongoing forums for discussion of strategy, operational coordination, and maturing and use of new technologies.

There's been a parallel effort to develop the Alaska Coastal Mapping Strategy Implementation Plan under the leadership of Nicole LeBoeuf, Juliana Blackwell, and Ashley Chappell. Both of these plans are on the agenda for discussion at this meeting. I look forward to hearing your ideas on how to achieve the bold vision for implementing NOMEC and the ACMS.

There will be a public comment period today and tomorrow, as well as dedicated time to hear from the panel members. In addition, we'll have a short update from the Tech Working Group on their work on navigation services and limited visibility.

I want to pass on my regrets that all of you could not join me in Hawaii as planned for this meeting. We've already decided to hold the spring meeting virtually as well with the thrice-deferred Hawaii meeting planned for the fall of

2021.

We decided early on in the pandemic that since we're going to have to do a lot of virtual meetings, that we should take the time to get good at it. I'm proud of the production team that has put this meeting together and I have every confidence that this meeting will be smooth and engaging for all participants.

Ed and I intend to make this as convenient and productive as possible. NOAA leadership has been very generous with their time in participating in recent HSRP meetings and this one and I look forward to hearing their perspective in a few minutes.

A few administrative notes. This session is being recorded and transcribed. Your individual permission is required for use of audio as it will be retained and disseminated on the meeting website and accessible as a public document. You can withhold this permission by abstaining from speaking or dropping off the webinar.

Ethics reminder to members. While serving the HSRP during the two public meetings per year, I want to remind the HSRP members that you serve as a NOAA employee in your personal capacity as a subject matter expert and you do not represent any other group, industry, association, or other entity.

Please remember to take off your regular work hat and replace it with your NOAA hat when you provide your questions, comments, and guidance to NOAA and to the administrator. Thank you for your service to strengthening NOAA's hydrographic and navigation services portfolio. We do so appreciate your vision and help.

While we normally do introductions to the NOAA staff, due to the condensed nature of this call, we'll include them in the summary report for the meeting. NOS has a variety of staff who can provide subject matter expertise and administrative support. On this webinar, there are approximately 20 additional NOAA staff

who follow the work of the HSRP and can assist you throughout the year.

This meeting has been a real labor of love for many on the NOAA staff and I would like to take a moment to shout out to in alphabetical order those who have helped put this together.

Alexandria Allison, Mike Aslaksen, David Barglow, Glenn Boledovich, Captain Rick Brennan, Christine Burns, Michelle Burt, Ashley Chappell, Melanie Colantuno, Kristen Crosset, Virginia Dentler, Chris DiVeglio, Chrissy Hayes, Lucy Hicks, Tricia Hooper, John Kelly, Nathan Littlejohn, Lynne Mersfelder-Lewis, Laura Rear McLaughlin, John Nyberg, Amanda Phelps, Julia Powell, Galen Scott, Jill Stoddard, Captain EJ Van Den Ameele, Darren Wright, and the others who I may have missed or who are providing ongoing support to the HSRP. Thank you for your teamwork.

The goal of this meeting is to discuss the current state of NOS Navigation Services Portfolio projects, provide key updates on ocean

mapping such as NOAA's role in developing the two strategies aforementioned, and to initiate a dialogue with the HSRP members on these and other topics, their issue or position papers and recommendations. The HSRP is discussing two position papers on these strategies, and we seek your comments at this most earliest of stages.

The HSRP provided us with insightful recommendations on emergency response and artificial intelligence at the last meeting. In regard to conserving time, all the HSRP member and speaker bios are in the advanced materials on the web, so we will dispense with reading speaker bios. You may hear four minute, two minute, and one minute reminders to presenters to help keep the presentations and meeting on time.

And with that, I would like to turn this over to Ed Saade, the HSRP Chair.

Oh, one more piece of logistics. To the stakeholder staff and others joining the webinar, I encourage your public comments and input, especially on the coastal and ocean

mapping strategy.

We're allocating a lot of time for this, much more than we usually do because we expect to have public comment. If you have a public comment or question -- I should say we have already received over a dozen public comments, and we have those already captured.

In addition, if you've not yet sent in a public comment or question, please type it in to the question tab in your GoToMeeting interface. And from there we will queue it up for recognition during the public comment period, and it will also go into the public record for input into those strategies or otherwise as appropriate.

During the public comment period we will recognize some of those who have provided comments in advance to make a brief summary of their remarks during the course of the meeting.

And we may have some additional time for additional speakers if you would like to have the floor. We're probably going to be limiting

it to just two or three minutes per speaker because we have a lot of people to squeeze into the allotted time.

So with that very not-brief introduction, I would like to turn this back over to our chairman, our very-capable chairman Ed Saade. Thanks, Ed.

MS. DENTLER: Ed, you're muted.

CHAIR SAADE: Sorry. Okay, thanks.

As mentioned, I'm Ed Saade. I serve as the HSRP Chair, President of Fugro USA based in Houston, but I'm transmitting from San Diego, California today. I'm very happy and excited to participate in this latest public meeting of the HSRP and the second time around doing it all virtually.

As Shep pointed out, I, too, want to thank all the technical and IT staff, and even the software providers, that makes this look so well and work so well. Obviously over the last several months we've got a lot of experience in this.

As has been repeated a number of times and in multiple venues, the ocean is having a moment, and whether it's hydrography or coastal initiatives in focus, commerce, fishing, whatever it might be, the blue economy is getting the attention and focus and awareness it deserves. And over the next two days I'm sure we will all be very impressed and educated and informed, so looking forward to all that.

Nicole LeBoeuf and Dr. Jacobs, the HSRP panel members, staff and stakeholders, thank you for joining us. We are all operating in this new normal of the COVID-19 impact, but everyone is doing a good job and very productive.

I want to recognize the following panel members. Julie Thomas serves as the co-chair. There are three working groups with chairs, and they include Dave Maune and Julie as the chair of the Planning and Engagement Working Group; Ed Page, chair of the Arctic Working Group; Deanne Hargrave and Lindsay Gee, chair of the Technical Working Group.

You'll hear from Anuj Chopra and also Qassim Abdullah. More about the Technical Working Group tomorrow. Also all the bios are in the web materials. Thank you for your leadership and your ability to get the job done and great guidance.

Dr. Jacobs and Nicole LeBoeuf, I look forward to the next in-person meeting and the positive work we will do together. In the meantime, the HSRP will discuss and hope to provide you and the papers with recommendations as part of the outcome of the meeting. Dave Maune and Julie Thomas and Lindsay Gee will lead us in a discussion of the draft issue papers on the two ocean and coastal mapping strategies along with the NOS leaders.

Following up on Rear Admiral Smith's request for comments, I encourage your public comment and input on the two ocean and coastal mapping strategies. It's been really nice participation already with some of the pre-meeting comments, so it's great to see people

really engaged.

Due to the condensed meeting format, we ask you to provide your comments in writing so we can capture all of them, and then -- I'll, of course, share all of them.

Okay. So in moving on to the next phase of the meeting, we're honored to have Nicole LeBoeuf and Dr. Jacobs in attendance.

Nicole, I'm turning this over to you for your remarks.

Again, her bio is in the web materials.

Go ahead, Nicole.

MS. LeBOEUF: Thank you Chairman Saade, Admiral Smith, Julie and the rest of the HSRP. Welcome to you, Dr. Jacobs. Thanks to Representative Don Young who I understand will be joining us via video a bit later.

Aloha and good afternoon, everyone. Thank you for joining the virtual Hydrographic Services Review Panel meeting. Thank you also to everyone who helped pull it off. Well done.

Clearly COVID is impacting our lives and our work, but under any circumstances it's good to be together to discuss matters of importance to all of us.

As you might have imagined, I have spent a lot of time thinking about COVID, but also about coastal resilience and the essential role that the National Ocean Service, including, of course, NGS, CO-OPS, and Coast Survey play in ensuring the resilience of our coastal communities, economies, and ecosystems.

As a leader, I have also thought a lot about the resilience, both physical and mental, of the entire NOS workforce and our close partners, like many of you, as we serve our nation during this pandemic.

I have done what I can to stay in communication and engage with our team and with our leadership to stay checked in, reconnected, and to make sure that everyone knows that they are supported both personally and professionally. We are indeed facing challenging times, and I'm

sure your organizations are also dealing with many of the same issues as we are at NOAA.

At NOS I'm asking for our folks to be kind and flexible with their colleagues and to remain adaptable and innovative in their work. Through our words and deeds we are striving to cultivate a compassionate, forgiving, yet driven workforce across all that NOS does, and that combination is especially important to me because the changes that are taking place along our coasts are not stopping for COVID.

In fact, with our attention drawn to our various supply chain, our contributions to the U.S. blue economy that all of you represent is top of mind for our nation in the last few months. Despite the various challenges of COVID and 2020, everything else, NOAA and NOS are working harder together with folks like you all on the HSRP to promote safety in navigation and to provide essential services to protect life and property no matter the landscape.

Before I say a few more words on that,

I'd like -- on behalf of NOS I want to thank the panel in advance for your advice and recommendations, and the public for your comments as well. Your input is absolutely critical to improve our services and ensures that our ongoing success is relevant in providing 21st century navigational and other related services.

I know that one of the major topics you'll discuss today, as Admiral Smith has already mentioned, and tomorrow, is the National Strategy for Ocean Mapping, exploration characterization, as well as the Alaska Coastal Mapping Strategy.

I won't touch on these in any more detail. You will be hearing from Admiral Smith and Juliana Blackwell, and you've heard from Ashley Chappell before. But this work is very important to me and to NOS. We are fully supportive and engaged in these efforts. I do hope you'll provide us with feedback. Your expertise is invaluable.

And switching from how awesome you

are, HSRP, to how awesome we are -- it's really a fun crowd, right? -- I'd like to take a look at NOS's response to the most recent hurricane in this, another active hurricane season.

The most recent hurricanes, Laura and Sally, really remind me of the work of -- our emergency response work, that is, from the Office of Coast Survey, National Geodetic Survey, and CO-OPS, the Center for Operational Oceanographic Products and Services.

The National Geodetic Survey was on the scene immediately following both Hurricanes Sally and Laura to collect aerial images in specific areas that were identified by FEMA and other state and federal partners.

For CO-OPS the peak water levels during Hurricane Laura measured at our Calcasieu Pass water level station was 9.19 feet above mean higher high water. Now that's not the absolute storm surge, and that was higher still, but this is the second highest water level record at this station behind the record set by Hurricane Ike in

2008 which was 10.01 feet above mean higher high water level.

Similarly, Hurricane Sally peaks as an observed water level at the CO-OPS station in Pensacola, Florida at 5.6 feet above mean higher high water. This is the third highest water level on record exceeding water level records for Hurricane Katrina at the same station.

And as recently viewed this past weekend, we saw the impacts, and are still assessing the impacts of Tropical Storm Beta. But as water levels and CO-OPS stations along the Texas Gulf coast measured between half a foot and two feet above normal high tide levels.

As you know, following storm events the Office of Coast Survey is also on the scene to ensure that we can reopen our ports safely and efficiently. For example, the Hydrographic Services Division contracted for rapid survey efforts on a 30-mile stretch of the Calcasieu Ship Channel leading into the Port of Lake Charles.

This rapid response was critical to ensuring the reopening of this port for deep draft ships immediately following Laura. Additionally, the Office of Coast Survey's Navigational Response Teams in Stennis, Mississippi and in Fernandina Beach, Florida worked with U.S. Coast Guard to survey Pensacola. This survey work was also essential to reopening that port.

A big thank you to CO-OPS and to OCS and to NGS for their important work in these hard-hit regions of the country. And, of course, all being done during a global pandemic. So thank you to everyone.

In light of these hazardous conditions, environmental and coastal change and flooding, across NOS we are working hard to improve the suite of services and tools that we provide to our nation to protect and support maritime commerce which is one of the backbones of our U.S. economy. We are looking to shout that fact from the rooftops.

Just this summer NOS, NOAA, and the Bureau of Economic Analysis released first of its kind prototype statistics on the marine economy to prove this very point. According to those data, our nation's economy -- our nation's marine economy contributed $373 billion to our gross domestic product in 2018 and as a sector grew faster than our nation's economy as a whole.

Everyone here probably knows that it's nearly impossible for most Americans to go a single day without eating, wearing, or using products that come from or through our ocean and coastal communities.

NOS's navigation, observing, and positioning and mapping programs provide underlying data essential to services that support our very way of life. We continue to adapt to the challenges of our time, and we continue to talk about it making sure that Congress and others know what we do.

Just a few weeks ago I personally briefed 245 people, 60 of whom were Congressional

staff, about the services that we provide at NOS for our nation's coastal resilience. This was a record turnout for a NOAA Congressional briefing.

And we are particularly pleased to talk about this as well as the wider NOAA initiatives that improve our up-take of artificial intelligence, unmanned systems, and cloud computing in accomplishing our goals.

I want to thank the HSRP for their most recent issue paper on automation and artificial intelligence and post-disaster products and services.

This panel's recommendation to improve collaboration with academia and public/private partnerships identify areas for improved faster response times, and consider stakeholder input are vital to improving our success. Thank you.

We look forward to continuing to examine our products and services and work with other federal and state agency partners in doing so. In addition to the rapid onset of threats like hurricanes, we also deal with slow-moving

chronic threats to maritime safety and navigation such as fog and limited visibility and enclosed ports and waterways, which I understand this group will discuss tomorrow.

And this afternoon you'll be hearing from the directors of the Navigation Services Portfolio at NOS including Juliana Blackwell from the National Geodetic Survey who will give you a status update on NGS's coastal mapping activities, and the National Spatial Reference System modernization effort. Rich Edwing of CO-OPS will talk about their plans for expansion of the PORTS program.

And Admiral Shep Smith from the Office of Coast Survey will cover the progress report on unmapped waters, the new OCS Strategic Plan, and the technology needed to implement the new ocean mapping strategy that I'm sure you've heard so much about. We will also get an exciting update from Captain Andy Armstrong on the UNH/NOAA Joint Hydrographic Center partnership.

In terms of a brief budget update, you

may recall that last year Congress enacted NOS's FY '20 appropriation at its highest level yet, $606 million. As fiscal year 2020 comes to an end, just a couple weeks to go, it is apparent that our FY '21 appropriation will be delayed, and it does appear that we may be on our way to getting a stopgap measure or a continuing resolution at least until December.

The House has, however, marked up our FY '21 appropriations bill, and the numbers remain good for NOAA and for NOS including funding the navigation, observing, and positioning programs pretty much at level with last year's appropriations, and some overall modest increases for the rest of NOS. The Senate has yet to mark up FY '21 funding. Not clear if they will or when they'll do it, but stay tuned for more.

Our U.S. Marine Transportation Information System infrastructure has plenty of areas that would benefit from job creating and economic investment in precision navigation like

activities like hydrographic surveys, shoreline mapping, geodetic modernization, and water level network enhancement. So hopefully we're getting the word out, and Congress and stakeholders like you are aware and can advocate for those programs.

With that, I want to thank you again, everyone in attendance. Mahalo nui. I am looking forward to our discussions this afternoon and to a future meeting in person. Thank you.

CHAIR SAADE: Thank you, Nicole. I appreciate your remarks.

Dr. Jacobs, we're thrilled to have you back for your second meeting to continue the dialogue and contribute strategic and useful ideas to make small improvements for your navigation -- yours and our navigation services portfolio.

His bio, as well, is available on the web materials.

Over to you, Dr. Jacobs.

DR. JACOBS: Thank you. It's great to

be here. Big shout out to NOS for the fantastic response with the landfalling storms, Laura and Sally. Seems like we're in a lull now, and I hope it stays that way, but I'm afraid it probably won't.

Thank you, Ed, for the introduction. Thanks, Shep. And looking forward to Representative Young's remarks, as well as others. Wish we could be in Hawaii, but unfortunately a virtual meeting is probably the best we can do right now.

I think most of you probably have either met me or know me, but when I'm not working at NOAA, my two favorite things to be doing are either surfing or fishing, and obviously maritime navigation services are important in both.

Top line message is the work you do really, really matters to us. The work of OCS, CO-OPS, NGS. It's critical to the blue economy which is a top priority at the agency.

A lot of these programs not just

benefit us but also really, really strengthen our public/private partnerships. I think a lot of this is evidenced in the presidential memo on ocean mapping. Clearly a top priority from the White House all the way down.

Really looking forward to joining in on the sessions throughout this afternoon because I think we'll be really digging into a lot of these implementations and various associated strategies.

I'm personally excited to talk a little bit about the nearshore bathymetry. I have just been in the process of updating all the maps on my Lowrance. I sold a small boat that I had and got a poling skiff and in the process of updating all the maps had been looking at a lot of the new data. Most of the fishing I do is near shore, but all the maps include a tremendous amount of data. Of course, it was exciting to me to think that I'm downloading data from my own agency's website.

But these types of applications are

extremely important. And not just necessarily for maritime navigation but the data is also really, really useful for emergency management and conservation. I'll give you a couple examples of that.

So just in this last year, I think that with these landfalling storms a lot of people had seen the storm surge forecasts. And that really -- to properly forecast a storm surge, it starts pretty far off shore because a lot of the bathymetry when you get that amount of water pushed in shore really can either spread out or pile up.

A lot of this is, of course, a function of the atmospheric whether models producing the track of the storm and the winds, but if we don't understand the bathymetry, we're not going to understand the height and how the storm surge is magnified.

This is also true before the swell and the waves. So lot of the wave refraction amplification starts way off shore. We see this

with our WAVEWATCH III, with our nearshore models. It's also really relevant for rip current forecasting whether we'll be dealing with rip currents or just a straight longshore current.

One of the big challenges going forward is -- and I think that everyone probably saw this with Laura. We nailed the track, but the rapid intensification, particularly when you get within a few hundred miles of the coastline in the Gulf, is always going to be a challenge because we really have to do a better job of understanding what's going on below the surface when it comes to upwelling.

And having a good handle on the bathymetry as an input parameter to the models is critical. So a lot of these models are two-way coupled ocean and atmosphere models, and the bathymetry is a boundary condition on the ocean model, so it's incredibly important data that we have there. And the high resolution models we run, the higher resolution input data we're going

to need.

I know it's also important when we're talking about a lot of the Alaska coastal mapping as well. There's a ton of coastline up there, and we're in the process of trying to map as much of it as we can.

I did want to take a quick second to talk a little bit about COVID because that's, of course, why we're all here virtually. I think everyone probably knows resuming the fleet operations is a top priority. We took a pretty big hit as far as lost days at sea. I think I've seen numbers estimated around roughly 400 days at sea, but we're getting things back underway.

OMAO has been working really closely with CDC and NIH to really sort of define what the protocols are, how we should operate, what type of environment we can. I know that a lot of the crews have been quarantining themselves even before they get on the ship just to make sure that we're not bringing anyone with an infection onboard.

Then we do keep everyone as isolated as possible. OMAO has access to pretty rapid testing, so, not just for our vessels but also with our aircraft which, as you can imagine, they are doing a lot of flights in the storms, and they're in a small contained area.

But, fortunately, most of the vessels are starting to get back underway. The Thomas Jefferson departed Norfolk on July 19th. It's working on a hydrographic project off the Virginia/North Carolina coast.

Hassler departed August 29th working in the Chesapeake. Rainier got underway on August 4th conducting projects for Coast Survey in Southeast Alaska. Also the Fairweather departed Seattle on September 14th also headed to Southeast Alaska.

I can say, and I think a lot of people probably know, we're moving ahead with the procurement of two Class B vessels. We will be releasing probably in the next couple of weeks the FY '21 Fleet Recap Plan. I know that the NOS

and OMAO are working on this really hard. I think they may even have a brief together on this later today.

I just wanted to again reiterate that the recommendations that everyone provides are incredibly important, and we're definitely listening to what everyone is saying. Really, really appreciate all the thoughtful comments from the April meeting. As Nicole mentioned, we are really looking at a lot of different aspects of public/private partnership, particularly when it comes to advancing AI in various ways to manage data.

I know, as I've just been talking about high resolution data, and the more sensors we have deployed and the more areas that we're going to be mapping, actually managing this data and sorting through it and optimizing it are going to require a lot of different techniques, AI being one of them.

And, of course, data management is one thing, but data storage is also something that's

always going to be a challenge going forward. I would like to mention the NOAA Big Data Program. This is something that a lot of folks in the atmospheric and meteorology community have been tracking for a while.

The data that everyone here is collecting and providing is definitely going to be a component of this. Essentially what the Big Data Program is is it's a partnership between NOAA and commercial cloud service providers.

And we've -- if you ever talk to anyone in IT and computing at NOAA, the first thing they'll tell you is we don't have enough high-performance computing and we don't have enough storage. There's a lot of data that we have that the public would really love access to. The trick is how to afford the storage and how to get the data into the hands of the public.

The cloud service providers absolutely love this idea because while they're not allowed to charge for our data, they have to make that freely available, they can charge for the

processing of our data. So by allowing them to host our data for little or no charge, we're driving business to them.

So it's a good business model for them, it solves our data storage problem, and it actually allows us to get more data out into the public which I think ultimately will benefit everyone, from emergency managers to the maritime community.

I did want to mention a couple other things as we're doing a lot of this new AI and processing of data. One of the cool things that I saw in there was a structure for motion. I know probably in your community, and at least where I saw it in use out in Hawaii, was sort of mapping a lot of these reefs. But it was kind of cool. They actually took the camera, and I got a 3-D rendering of myself.

So I can't describe it any other way than I look like an action figure in a video game. But it's a really, really cool technology, and it's very similar to the technology that I

actually have in my new Lowrance system that allows me to sort of view the bathymetry in three dimensions so very, very cool capability.

Also real quick wanted to say -- excited about the recent PORTS expansion in Kings Bay, Georgia and Portsmouth, New Hampshire. It's a really big deal for us and really, really appreciate the partnership with everyone here on that.

And in general just really excited to see the continuation and evolution of what we're doing here. It's really, really important to the agency. Like I said before, I just can't express how valuable the work everyone here is for the agency.

So I'll stop there, but I'm going to be -- I'll be logged in and listening all day, so thank you.

CHAIR SAADE: Thanks, Dr. Jacobs. Really great as always to have you join us, and any insights on the data management and sharing, as well as the AI and autonomous tools. All that

is really good insight and helps direct the thought process.

Also, of course, the update on the COVID impacts and the vessel operations, that's of interest, and it's good to see that there's some positive news of movement and activity.

We're going to take a 15-minute break right now, so by my clock then we should all be back at 10 minutes before the hour. All right. Do I have that right? Yeah.

RDML SMITH: Hey, Ed. Do we still have the video from Congressman Young?

CHAIR SAADE: I'll have to defer to --

MS. DENTLER: Yes, it's cued up.

RDML SMITH: Okay. So why don't we watch that before the break.

CHAIR SAADE: Yeah, let's do that. Thanks.

CONGRESSMAN YOUNG: Hello, I am Congressman Don Young. Thank you for inviting me to make this short video. I have been a long-time

supporter of NOAA, as you know, and greatly appreciate the work you do to make sure that our oceans are healthy and safe.

Healthy oceans are essential to Alaska's economy, as you know, but the mapping is really really really important because we have a lot of things happening in the Arctic now. Along Alaska's coast, the depth of the water, the difference in water as far as -- shipping, the whole thing, and NOAA is going to play a major role in that.

We work every time to communicate with your chiefs, and we try to get things done. Actually, we've been successful, this Congress, I'm proud to see that our Integrated Coastal and Ocean Observation System Act passed the House, and I will continue to advocate for final passage of our bill in the Senate or the Senate bill in the House so that the Integrated Ocean Observing System can continue being our eyes and ears on the oceans.

There is much work to still be done,

as we know. We really are not sure with climate change, the effects upon the fisheries and of course shipping channels. That's where NOAA's also going to play a major role with the Coast Guard.

So again, thank you for the short invitation to say hello to you and thank you. Keep working. We will work with you, and we'll see if we can't have the right funds to do the job for Alaska and of course the nation as a whole. God bless.

RDML SMITH: A round of applause for Congressman Young.

CHAIR SAADE: That was a great addition to --

(Simultaneous speaking.)

CHAIR SAADE: -- today's meeting.

Okay. So I'm glad we got that in. It's great to see the Congressman, and he definitely is a big supporter of NOAA and, of course, all things Alaska.

Let's go ahead and take -- it's going

to be a 12 minute break, so we can come back at 10 minutes before the hour.

(Whereupon, the above-entitled matter went off the record at 1:38 p.m. and resumed at 1:49 p.m.)

CHAIR SAADE: Okay. Welcome back, everyone.

We're going to go ahead and continue, and up next, I'm turning this over to Nicole LeBoeuf for the session with the directors.

So, Nicole, over to you. Thanks.

MEMBER LEBOEUF: I was just rejoining, Ed.

CHAIR SAADE: Can you --

MEMBER LEBOEUF: And I'm sorry, I was just rejoining. Is there a question on the floor?

CHAIR SAADE: No, sorry.

It's all set for the next section where you'll be moderating the various presentations of Andy, and Rich, and Juliana.

MEMBER LEBOEUF: Oh, got you. All

right.

CHAIR SAADE: All set to go?

MEMBER LEBOEUF: I think so.

CHAIR SAADE: Okay. They're all queued up when you're ready.

MEMBER LEBOEUF: All right. My apologies. All right. Sorry, excuse me. And welcome back.

Thank you for the quick break, and I apologize for being a couple minutes late.

We're now ready to hear from our NOS Office directors on opportunities and challenges for NOS's Navigation Services Portfolio.

Our speakers that you know quite well will discuss a variety of topics, and I look forward to hearing their updates from each of the offices.

I'd like to start with Captain Andy Armstrong, the co-director of the Joint Hydrographic Center and the University of New Hampshire.

His full bio, of course, is attached

in the material. Andy, take it away.

CAPT ARMSTRONG: Thank you, Nicole.

So, NOAA and the University of New Hampshire have just begun a new five-year cooperative agreement for the operation of the Joint Hydrographic Center.

And I'm going to share with you today the research plan for that new five-year agreement, and since the center is run both by NOAA and the university, I'm speaking today on behalf of myself and Dr. Larry Mayer, the co-director from the University of New Hampshire.

Can I have the next slide, please?

So, the University of New Hampshire Joint Hydrographic Center has its primary facility in a beautiful, dedicated building on the campus at the University of New Hampshire.

And we have a modern waterfront facility at nearby New Castle, New Hampshire, and that waterfront facility's where UNH maintains its research vessel, and where indeed the NOAA Ship Ferdinand Hassler, one of our hydrographic

survey vessels, is homeported.

So, we're proud of that relationship with NOAA, as well as the research relationship at the center.

So, could we have the next slide? So, a little bit about the center.

We actually have about 100 people at the center, which includes 14 research and teaching faculty, a number of affiliate faculty members from industry and other academic institutions, as well as from NOAA, staff of research scientists, and other supporting staff, and we actually have 14 NOAA scientists based at the center.

Actually, outside of Silver Spring, and Norfolk, and Seattle, one of the biggest groups of NOAA, especially National Ocean Service employees.

A significant component of our center is graduate education, and we have 31 graduate students at the center.

And in addition to that, we have a

number of international fellows who come to the center for a fellowship in ocean mapping, and then return to their home countries, and that is a great institution that's creating a new and effective network of ocean mappers around the world.

Next slide, please.

A key part of the center is industry partnership, and we at the center derive tremendous value from this partnership.

We're able to leverage their contributions, stay in touch with the development in the private sector.

We have a pathway for our research-to-operations, and great opportunities for our students.

And in return, our industry partners derive, I think, significant value from their relationship with the university.

And they have both access to code and to researchers, right to license things, and the ability to collaborate and use our facilities.

So, and next slide, please. So, now for the cooperative agreement.

Sometimes these terms are kind of arcane, but a cooperative agreement is really just a grant in which the federal government has substantial participation.

And then you saw that our substantial participation includes those NOAA scientists on the site working with the university researchers, the presence of the NOAA survey ship at our facility, and a number of other interactions that we maintain.

So, this new award was done through a competition. It was just awarded competitively.

And so, the funding opportunity was released in March of this year, and then there was a competition, and based on that competition, the University of New Hampshire was selected, and the award was issued last month.

So, the new five-year period is actually going to start in January and will run for five years, following that day.

So, a little bit about the plan, and the next slide, please.

So, based on the opportunity notice from NOAA and the proposal submitted, there's going to be three major programmatic themes for the next five years.

The first one will be advance the technology to map U.S. waters, then that'll include a subtheme for both data acquisition and extracting maximum value from the data.

A theme to advance technology for digital navigation services, and that'll include both ends of that process, the tools for the navigator, and the tools for the development of electronic charting products.

And a third theme, which is kind of hybrid, and it includes a study of acoustic propagation and effects, particularly effects on marine animals, and this is where our education and outreach program resides.

I'll talk a little bit about each of those, so the next slide, please.

So, in the technology to map the U.S. waters, on the acquisition end, the center will be looking at systems and sensor monitoring technology, real-time quality control of hydrographic surveying and ocean mapping work, and of course, continuing to develop autonomous platforms and autonomous systems for processing and managing data, trying to not only gain benefits in efficiency, but to improve the quality of the data as we collect it.

The next slide, please.

So, on the value end, we'll continue to work as the center has for many years on efficient data processing.

We'll be looking at autonomous processing techniques, cloud, AI, and machine learning technology, looking at developing some new interactive tools and an editing environment.

And of course, we'll be doing this on the full range of bathymetric data, including acoustic and lidar data.

And then, a little farther down the

line, we'll be looking at the visualization and interpretation, and development of products across the full spectrum of ocean mapping.

The bathymetry, the object detection, and the water column, and backscatter, and so on.

Next slide, please. On the navigation services, I said we'd be looking at automated cartography tools, automated generalization, ideal portrayal of data.

We'll be looking at virtual reality primarily as a pathway to augmented reality, and I know the panel is very interested in continuing to operate and to developing technology so that ships can continue to operate in the fog, and we think augmented reality is a means that may allow that.

And of course, we'll be looking for improved ways to display weather, currents, and hydrodynamic model outputs on those electronic charting systems in use by both the recreational and professional maritime community.

Next slide, please.

So, in our third theme, we're going to be looking at the marine soundscape and marine geospatial expertise.

And so, we'll continue to work on modeling and majoring the sound field from our hydrographic echo sounders, and trying to understand the impact these sounders have on the ocean soundscape, particularly the effect on marine animal sound production and marine animal behavior.

Next, please.

So, in that regard, this is from the last period, but I think it's a significant item to note.

We've already gotten the Journal of the Acoustical Society of America publication out, and so we're adding to what's known as the sort of best available science in these activities with the studying the effect of 12 kilohertz multibeam echo sounders on some beaked whales off Southern California, and demonstrating that there were no changes in their behavior

detected in the case of this echo sounder operation over their feeding areas.

Next slide, please.

Education, of course, is a significant part of what we do.

Right now, we're in a blended mode where we're trying to mix some very socially distance hands-on practical training with mostly online classes.

And of course, we want to maintain and support student research projects, which are fundamental to both the students' education and to our research.

And ultimately, our goal is to graduate capable, forward-thinking hydrographers, and we've done that for many years, and hope to continue that.

Okay, next slide.

So, finally, you can see a little bit what we've done over the years on our website.

The website address is down at the bottom there, and all our progress reports since

2001 are posted there.

And next slide.

This is our latest one as of the end of 2019, so I think you can take a look at that and get a much deeper dive into what's been going on, and hopefully at the next meeting, Larry will begin to be able to present some of the results of our new research efforts.

So, thank you very much, Nicole.

MEMBER LEBOEUF: Thank you, Andy, and congratulations for all of the hard work that's being done there.

We're looking forward to another great five years of this partnership with the University of New Hampshire.

Just really amazing everything that's already been done there, and that we're looking forward on.

So, let's pass the mic such as it is over to Rich Edwing from CO-OPS, the Center for Operational Oceanographic Partnerships, for his update. Thank you.

MR. EDWING: Great. Thank you, Nicole.

So, as Nicole mentioned earlier, we're almost to the end of the fiscal year, so I thought it'd be a good time to look back at the accomplishments and talk a little bit about what's coming up next year for future accomplishments.

Before I start, I will mention that, you know, we do have a pandemic going on, but I was very impressed and proud of my workforce for everything that did get done this year.

I've got a lot of good things to talk to you about today.

So, next slide, please. So, as Dr. Jacobs mentioned, we were able to establish two new port system this year.

One in Kings Bay, Georgia. Both with the Navy.

And the one in Kings Bay is to help nuclear submarines transit safely in and out of ports down there.

And up in New Hampshire at the naval base there, it's to, you know, support naval operations transiting in and out of there, as well as they wanted information on coastal hazards, you know, storms, as well as long-term sea level rise.

These are ports number 35 and 36 in the growing network of PORTS.

Next slide, please.

So, you know, we have found that, you know, once you establish a PORTS, you're not necessarily done because if people start using the information and get used to it, and see the benefits, they start adding on more sensors.

And so, across the network every year, you know, we're doing a lot of work to, you know, just not maintain sensors, but add additional ones.

So, I won't read through the list here.

You can see there's a variety of sensors being added on, from wave buoys to

current meters.

I should mention the wave buoys, we don't actually do that work ourselves. We partner with the Corps of Engineers.

They have a wave buoy network called the Coastal Data Information Program, and if they have a buoy that's already operating nearby when we establish a PORTS, we bring that data in and incorporate it, or sometimes the partners will add a buoy on.

The last thing I will mention on this slide is that last bullet.

We did complete phase 1 of a NOAA Small Business Innovation Research grant to develop a new fog sensor.

There was a whole separate webinar on that given to the HSRP, so I won't talk too much about it but suffice it to say, a much less expensive sensor, as well as have a lot greater capabilities than the technology we're using now, so we're looking forward to, you know, completing the work on that.

Next slide.

This is a big year for us, where we did our last hardcopy Tide and Tidal Current Tables, and, you know, fully transitioned over to digital.

That's 150 years of published tables, so it was a little bit of a hard tradition to leave behind, but the digital tables obviously were cost-effective to produce, worked well, you know, integrated with other technology nowadays, and really provides an improved product over the hardcopy tables.

We did a couple of surveys in South Texas and New York Harbor, and we updated tidal current predictions there for safe and efficient navigation.

And we developed and transitioned to operations a new rapid response buoy.

It does currents and then meteorological parameters.

We're using it on our own surveys, but it can also be done in cooperation with the

Office of Response and Restoration if they're responding to some sort of oil spill or other type of HAZMAT spill, and need that kind of information to support their response.

Next slide.

We built our NWLON station down in Rockport, Texas.

That was destroyed by Hurricane Harvey, and we got some supplemental funds to do that, and that work was completed.

We developed an internal integrated modeling and observation plan that I'm excited about because it's giving us a path forward for how to better integrate our modeling and observation products, but then it's also helping us better understand how models rely on observations, and how to really have those two types of information infrastructure work together better.

We're continuing a transition to primary water level sensors that are National Water Level Observation Network.

We installed 11 this past year, and we transitioned eight stations fully over to the microwave water level.

We do a year-long data comparison between microwave and acoustic, and once we're done with that data comparison, then we can remove the acoustic, so, you know, we did that at eight stations.

And then, we've been doing a lot of VDatum engaging, both with base funds and supplemental funds.

Some of that work did get delayed into next year because of COVID, but we still managed to get a fair amount done using hurricane supplemental funds down in Texas, Louisiana, and Florida.

Next slide, please.

We've provided scientific support for an organization called the LA 1 Coalition, and they are supporting the elevation of Louisiana Highway 1, which runs from Port Fourchon up into the interior of the state, and that is the only

transportation corridor between a major, major seaport for energy imports.

And it floods a lot, and it's going to flood more, and we did an analysis which showed the increasing rate of flooding that was going to occur if it wasn't elevated.

And the coalition was successful in obtaining $135,000,000 worth of grant funding to get that highway elevated.

And they really gave us a lot of credit.

They gave a lot of credit to the scientific analysis that really showed, you know, the impacts of the sea level rise in the area.

For a number of years, we've been putting out a High Tide Flooding Report and Outlook, reporting on what did we see in the past year for high tide flooding, and, you know, what does the next year look like?

It always gets a lot of media attention.

I think, you know, we've had like 40

different media outlets call in. Nicole led that call for NOS.

And it's a way to be able to talk about, you know, sea level rise, if you will, in a way because people are seeing this high tide flood in their backyards on a daily basis.

And then, a few years ago, we rolled out our Coastal Inundation Dashboard, which pulled together our historic, our real-time, and our forecast data into one place, particularly when storms are approaching the coast.

And we've come up with a strategic plan on how to continue, and not just enhancing that dashboard for those existing types of data, but also to bring in other sorts of resilience tools, like frequency of inundation, and exceedance of probability, and sea level trends, so you can come into one place and do all of your resilience planning from, you know, near-term a storm hitting us right now, to long-term sea level rise.

Next slide. Okay. So, pivoting to

'21.

We'll be establishing new PORTS in Valdez. That one will be done very soon.

It's not one where we're having to put in sensors.

The port has already put in sensors using some oil spill funding.

Wanted to work with us to get the data out through, you know, using our product generation and getting the quality control that we provide, and things of that nature, and we'll bring in our NWLON station and integrate all the data into PORTS there.

I think we have another Navy PORTS coming up in Kitsap, Washington, as well, that we just signed an agreement for, so that should be another one in '21.

Again, there'll be a lot of existing PORTS enhancements.

I've just listed one here because this PORTS about to be done.

We've had to delay it now a couple of

times because of all the hurricanes that are coming into the gulf this summer, by adding visibility and current meters to Mobile Bay.

Port Moller, NWLON should be reestablished.

That would've been reestablished in FY20, but because of COVID, it's a remote location and people weren't allowed to travel there.

So, that should be done early this fall.

IGLD, which is the International Great Lakes Datum update that's going on -- and that's a seven year effort, and we're kind of in the middle of it -- which is a big field campaign that's going on next year.

Really, that's a partnership between CO-OPS and NGS.

You know, we're doing kind of the water level data gathering and the GNSS measurements that are needed to bring the water levels and the land elevations together.

And we'll be doing more VDatum gauging.

Still more going on down in the Gulf of Mexico, but also doing Puerto Rico and then the Virgin Islands, as well.

Puerto Rico and the Virgin Islands was delayed from this past year.

Next slide.

Okay, and then we're going to be, you know, working on those Coastal Inundation Dashboard improvements laid out in that strategic plan, making those improvements.

We'll be upgrading our Northern Gulf of Mexico Operational Forecast System model.

It's actually merging three models that are kind of covering most of the Gulf Coast.

It's going to be expanding it to cover all of the Gulf Coast, and it's going to be going up the Mississippi River up to the head of tide, which was a nature deliverable from our precision navigation project, which you may recall.

So, that's a big deal.

And not on this slide, but we'll also be bringing in and operating a West Coast model, a large regional offshore model for the West Coast, which will be our first real-time data assimilation model, so that's exciting, as well.

That's bringing real-time data and helping improve the output of the model.

Oh, it is on the slide. Stop right there.

Visibility. I've talked to you about the ability of the Weather Service to provide visibility probability forecast that right now, they can only do in Tampa Bay.

It was done there as a demonstration project.

We're working with them to get that expanded now to other Weather Forecast Offices, but those forecasts will be coming out through our models, and upgrading the Northern Gulf of Mexico model is one step we needed to do.

Well, we should, once we demonstrate it -- and I think we're going to go to Mobile to

do that -- once we do it with Mobile, we should be able to do it, you know, many other places along the coast.

And finally, PORTS over AIS. You've been hearing about this one for a long time.

There's actually been a lot of work going on behind the scenes.

Now the Coast Guard's getting ready to test this at a few locations in October.

And if that works out, they'll be doing it for, you know, PORTS over AIS all around the country, you know, later in '21 or early '22, I believe.

Next slide, which I think was the end. Yeah, there we go.

So, thank you. And I don't know if we're taking questions or not, but back to you, Nicole.

MEMBER LEBOEUF: Yeah, thanks, Rich. What a great update.

Everything from the new Navy PORTS to that photograph of Port Fourchon, and Louisiana

1. CO-OPS is definitely providing information essential to decision makers. So, good stuff. Very exciting to hear what you've been up to.

All right, so next, let's move over to Juliana Blackwell from the National Geodetic Survey.

Juliana, what's going on?

MS. BLACKWELL: Good day, everyone. I hope you're having as beautiful weather as I'm having here.

It almost feels like I'm in Hawaii. I'm dressed for it, at least.

So, hopefully the sun is shining where you are, and you are all well, and continue to be so.

I'm happy to be able to provide a few updates today. We can go ahead to the next slide, please.

I'll run through what I plan on covering.

The first two topics on the delay messaging and the Foundation CORS infrastructure relate to the National Spatial Reference System modernization effort that's been underway for a while now at NGS.

The next three topics, emergency response, and hurricane supplemental, and coastal mapping status are involving the National Geodetic Survey's Remote Sensing and Coastal Mapping program.

And then, I will round out with an update on VDatum, which is a tri-office effort.

NGS, CO-OPS, and NGS collaborating on that tool.

And then a brief update on a socioeconomic benefits study that NGS recently completed.

So, we'll go to the next slide, please. Okay.

So, as I reported at our last HSRP meeting, NGS was getting prepared to officially release the delay of the modernization effort.

The modernization effort has been underway for a number of years. We had great success in doing the data collection and getting our projects aligned.

We hit some snags the last couple years with a number of difficulties, including some hiring issues, that I think have been resolved and continue to be something that we have to pay attention to.

But also with the number of shutdowns that we experience, as well as the current pandemic.

It's really just very difficult to keep the operations going with the airborne gravity collection, which is really a huge foundational piece of what the update will do for the nation.

So we officially announced the delay in June, and we did this through a number of ways because while we may understand that, it's really important to have our partners, our customers, our stakeholders understand why things are being

delayed, and give them our best update on when we think things will all come together.

So, some of the outreach efforts that we've been leading, including updates through our NGS news announcements.

These are messages that go out to our subscribers.

We've updated our webpage.

We've had a number of articles and newsletters, some written by NGS employees, others just being picked up from our partners who are helping us communicate the message of the delay.

And then through our geodetic advisory network.

We have a set of regional advisors who work very closely with those in their areas and provide them just enormous amounts of updates and support throughout the year on a number of topics, including the latest on the modernization effort.

One of the activities that I want to

highlight is the webinar that we hosted in August, which had more than 400 people on it, which included just -- almost every state, District of Columbia and Puerto Rico.

And through that mechanism, as well as through feedback from our advisors and our information center, we've been collecting feedback from our stakeholders.

And I'll say that while not everybody is happy that it's being delayed, that most people understand and expected that this would occur.

And many of our stakeholders are relieved that they have more time to prepare for this because this is going to be a major update in the geospatial world by bringing geospatial information into the new reference frame and the new datum.

So, they were glad that they had time to prepare because this current pandemic is affecting everybody, and we're going to bring them along with us.

One of the other sentiments that was shared with us is that when we proposed to our stakeholders through the webinar if they would want us to a phased roll-out and provide some of the products before all of the tools were ready, and the majority of the folks said they would like us to do this all at once.

They do not want to have a phased approach.

They really want to be able to transform their data and have all the bells and whistles available before the new reference frames and datum are in place.

So, we took that to heart.

I will say that on the not so happy side, we've had stakeholders who expressed concern that it's really important to have a modernized National Spatial Reference System to support autonomous ground transportation to support drones, to support the technology that is becoming more and more available.

And that that is needed sooner rather

than later to prepare for this.

And we understand that, and we want to provide it as soon as possible, but we're a little hamstrung right now.

Some of the other stakeholders that were not as happy are those who are currently underserved, I would say, by the geodetic infrastructure in their areas.

In particular, Alaska, and I know we'll have a chance to talk about that a little bit later.

So, those who don't have as great of a set of geodetic control in their area are certainly waiting patiently for an update to the national datums through our modernization effort.

Next slide, please.

The second activity is also related to the National Spatial Reference System modernization effort, and this is the establishment of a set of Foundation CORS in our network.

The goal is to have 36 stations of

federally operated, high quality, highly reliable stations that are designed for longevity.

And these would be the sites that we would work to maintain with our federal partners that would provide the very basic connection to the National Spatial Reference System and support the rest of the partner network as the primary control points.

These stations would also be the primary addition to the international global positioning effort that is occurring across the world.

So, the highest level, highest quality stations.

Currently, we are working with our partners at NASA and the National Science Foundation to bring in some of the sites that they currently have.

We were successful this year in getting an agreement with NASA to include 11 of their sites as part of the Foundation CORS network.

We also have a number of NGS sites, eight of them in particular, that are currently part of Foundation CORS -- have been established.

We are working with the National Science Foundation to try to get an agreement with them to bring another eight stations into the Foundation CORS network.

And then lastly, we have plans to construct nine new stations, and we're looking to partner with other federal entities, if possible, to achieve that final set of stations for the backbone of the CORS network and the backbone of the National Spatial Reference System.

Next slide, please.

So, switching gears a little bit to talk more about our Remote Sensing and Coastal Mapping applications and mission.

As has already been mentioned, NGS has responded to a number of hurricanes thus far this season, the first being in support of Hurricane Isaias that occurred in the East Coast.

The photos on the left show a before

and after image of the same area so that the changes in transportation systems, as well as infrastructure can be seen as you zoom into these images.

In later August, we collected imagery in support of the impacts of Hurricane Laura down along the Northern Gulf of Mexico.

Images on the right are showing the before canal, the Sabine Neches Canal, and then the lower image showing -- you can see the water hitting up against something.

That's a sunken dry dock that was seen through the imagery that we've collected.

So obviously, really important to be able to use this imagery to assess the priority ports that we're responsible for at NOS, and also to determine impacts to infrastructure, roads, other transportation systems, and obviously, you know, businesses and people's homes.

So, this imagery we continue to collect in support of not only FEMA, but obviously the coastal emergency responders and

social management, and a number of other federal agencies, and also supports a lot of NOAA and the National Weather Service's efforts to determine information about flooding and impacts based on the storm surge.

So, as Nicole mentioned, in addition to those two hurricanes, we also had a response last week to Hurricane Sally.

Those images are available on our website. Every time we do this, we learn more about the process.

Certainly we have our challenges now, too, with doing this in this environment with the pandemic.

So, we're getting better at it, and getting the data turned around, and making it accessible in different ways.

Next slide, please.

Just a very brief update on our hurricane supplemental efforts.

Over the last couple years, we received funding to acquire additional topobathy

lidar aerial imagery and to update the shoreline in areas affected by a number of different hurricanes.

I'll just briefly say that we are finalizing the lidar and imagery data sets for Harvey, Irma, and Maria.

And that the acquisition is complete for the Hurricane Florence, Michael, and Typhoon Yutu.

NOAA expects to continue to perform their quality assurance, quality control on these data sets, and hopefully we'll have all the final data from the 2019 supplemental in-house in 2021.

Next slide, please.

Briefly, on our coastal mapping effort, our program this year delivered 6.8 percent of the national shoreline.

We updated the shoreline, 57 of the nation's priority ports. We met our metrics, and exceeded them in some cases.

A lot of that has to do with the fact that we had a lot of this imagery already in-

house.

We're going to be a little bit challenged if we're not able to get out and collect soon to meet similar metrics for next year.

So, we'll just have to wait and see what happens with travel restriction and how that has impacted us.

And one other thing I want to highlight is this year, we've moved forward with the procurement of an upgraded topobathy lidar system and an updated camera system.

These will enable us to stay up with technology, as well as improve the processes and specifications for how data collection will be done in the future.

Next slide, please.

Very briefly, on the VDatum side, again, this is a collaborative effort between Coast Survey, CO-OPS, and NGS.

We worked together on this navigation service product that allows users to transform

spatial data between datums, including tidal, orthometric, and ellipsoidal vertical datum.

This year, we released two different -- we had two different releases, 4.1 and 4.11, and incorporated things such as enhancements to support ITRF 2014, some of the GEOID models that were produced recently by NGS, and also the first ever incorporation of spatially varying uncertainties for the New York/Long Island Bight regional models.

I think I've mentioned this in the past, but we're also working with the exploratory models for Alaska, and we expect that we will be able to get a West Coast regional model updated in FY22.

And lastly, with our supplemental work, we are also collecting foundational geodetic and water level data to help improve the future models in those areas the next time they're up for renewal.

And the next slide, next and last slide.

I just briefly want to mention a recent socioeconomic benefit study that was completed.

The NGS Aeronautical Survey Program, something that we don't talk a lot about here at the HSRP, but we do support land, water, and air positioning.

We do a lot of the quality control of airport surveys that are conducted by third-party surveyors in support of the FAA.

So, we did a benefit study on this to determine what the value is of that to the nation, and the study resulted in an estimate of between 3,000,000,000 and $13,000,000,000 over the next decade in support of the work that we do in support of keeping the National Airspace System safe, and in support of the Federal Aviation Administration.

We've done a number of other socioeconomic studies in the past, and I just listed those in case you want to take a look at them.

And with that, that is my last update. Thank you very much.

MEMBER LEBOEUF: Juliana, thank you. That is also a lot. You've got a lot going on.

I appreciate everything you all have been able to do throughout the season and throughout COVID.

So, last but not least, of course, let's pass the mic to Admiral Shep Smith as the Office of Coast Survey's director.

Admiral Smith?

RDML SMITH: Thank you, Nicole. And happy to bat clean-up on this great set of presentations.

I'm struck, as Rich pointed out earlier, at how much we've gotten done despite COVID, and I think the same is true at Coast Survey.

There are things we didn't do, and maybe that's why we had the attention span to get to all the things that we did.

So, I'm going to take a similar

approach as the other directors, but I'm going to really kind of focus a lens on how we're aligning Coast Survey -- given the conversation we're about to have with NOMEC, how we're aligning Coast Survey's activities with the NOMEC strategy, and a few activities that are relevant to that.

So first, we have a long awaited, what we were calling for a while our ocean mapping plan.

We delayed its release in order to have it be released in the context of the NOMEC strategy, and we're pleased with the amount of natural alignment we already had.

But this document is out and available. We published it in July.

But it really describes sort of a new take on how we're driving our ocean mapping program, our hydrography program, how we're prioritizing things, how we're balancing the needs for various different types of surveys, and most importantly, sort of how we're partnering

with the larger ocean mapping community to ensure that all of our work has the maximum public impact.

It's divided into two goals. The first is very narrowly on navigation needs, so optimize the safety, and efficiency, utility of the nation's marine highway infrastructure.

So, this is all of our shipping routes we want, and, you know, everything from inside the ports, all the way through to the major global transit survey.

So, that encompasses our work for improved services under precision navigation for high resolution bathymetry.

We're partnering really well with the U.S. Army Corps of Engineers to do that to a very high standard in our ports.

The second is the mapping the ocean more generally.

Now, this to be sure has navigation impact, but it is not narrowly targeted in the way that we would for a port or a route, say, but

it is generally charting the coastal waters in the United States, and all the way out to the U.S. EEZ.

This also happens to align completely with the NOMEC strategy as released by the White House in July.

Under that goal, we have several activities that really help us align and partner with others for that part of the framework, and we'll be hearing more about that later.

Next slide, please.

A huge part of this effort for both NOMEC and our own strategy is to make our data useful and usable and acceptable.

(Audio interference)

RDML SMITH: Is our effort to build, not an archive where all of the bathymetry collected over the years can be found in order for users to compile it in their own way, but really an operational database where you can just point your users at a bathymetric service and have access to the latest bathymetry.

Now, to be sure, this is certainly the most ambitious we've ever done, and it really differs from the way that other bathymetric compilations have been done in the past in two important ways.

One is that it's not at a fixed resolution, where we have high resolution data all the way down to a half meter in some areas.

That is preserved and available in the database.

Second, it is continuously updated.

So, the U.S. Army Corps of Engineers does surveys in port areas, sometimes quite frequently, and they distribute their data through a U.S. Army Corps of Engineers eHydro database.

We scrape that database daily and update the master database.

Similarly, we're pulling the NOAA lidar and the JALBTCX lidar from the Digital Coast archives, we're pulling data from NCEI, and as we discover new external data sources, we're

helping to bring those into the public domain, and helping, and pulling it all together.

And then lastly, there's a global effort -- well, I think we may hear from Vicki Ferrini in the public comment period -- the Global Multi-Resolution Terrain model, GMRT, was through a compilation mostly of the deeper part of the ocean.

And we're linking in a seamless partnership with Vicki Ferrini at Lamont-Doherty.

So anyway, this is very exciting. You can see the Army Corps' data there is in red.

It's a significant contributor for navigation safety.

As a percentage of the whole ocean, it's not very big, but we're very pleased that it's a well-integrated part of our system.

Right now, we are doing this in phases.

This is the first phase for just the Northeast, New York to the Canadian border.

And the next region that we're taking

on is the Gulf of Mexico.

But we anticipate being able to, you know, march through the U.S. coast, around the U.S. coast in the next few years and get this fully compiled and put it into full maintenance.

This is critical internally for our charting program.

As you've heard, we're updating all of our charts, a whole new scheme of charts, rebuilding all of our charts from scratch.

We simply cannot afford to go chart by chart and go back and pull historic data.

We have to have the bathymetry readily available.

And so, this is enabling not only for us, but also as a service more broadly.

It has big implications for our ability to more rapidly and rigorously update all of our modeling efforts, from the tsunami runup models to coastal hydrodynamic models for HABs and navigation, and storm surge models for coastal resilience.

And so, this is an exciting piece of geospatial infrastructure that we'll be serving on.

Next slide, please. Just some examples.

This is, you know, on the left there is all the different sources all put together.

It is rule-based, but they're complex rules.

It would be really much easier if the best data was always the most recent, but it isn't always the case.

We have very flexible algorithms to allow us to be able to understand and choose the most appropriate and most probable seafloor in order to knit together a seamless model like you see on the right.

Next slide, please.

We are continuing to build our interagency partnerships.

These are other federal agencies, and this doesn't even include all of the partnerships

we have within NOAA for doing bathymetry and seabed mapping at sea.

But we do have agreements in place with these three agencies that we've renewed in the last year, where we can be an execution arm for them, bringing our capabilities, our capacity -- not only our in-house capability and capacity, but also what we can bring through our contract and our other partnerships to bear on behalf of the entire federal government.

We've had a couple of really good examples in recent months.

Barry Arm, up in Alaska, is an area that was recently exposed by receding glaciers, and the assessment by USGS was that it was very dangerous.

As a geohazard, there's a high probability of a landslide causing a tsunami within Prince William Sound, which has a long history of devastating tsunamis.

And so, we were able to get that done by a contract.

And similarly, in the last few years, we've just finished up a multi-year project in the Channel Islands with both NOAA programs and interagency.

Next slide, please.

So in addition, so outside the federal government, we have academic partnerships with the University of New Hampshire regarding -- we've already heard about that -- the University of Southern Mississippi, and the University of South Florida.

We'll be hearing more about those in years to come.

But this really brings us a level of capability and reach into the academic community for deeper research, and trying out some bleeding edge technology, and that sort of thing that complements what we can do in-house to our contractors.

Our big hydrographic contracts were renewed this past year, and we're very pleased.

I think this is the strongest group of

contractors that we've ever had, and, you know, all these companies bring something a little bit different, you know, not only with sort of geographic spread, but, you know, differences in capabilities and expertise and equipment.

And it really helps us to be able to solve pretty much any problem you would imagine in the ocean mapping realm, and to do it at scale.

You know, one of the things that I like to say is that, you know, through these contracts, we could year over year double our OPTEMPO funds available, and I think that's pretty unusual for that level of nimbleness for a federal program.

And we often do maybe not quite double, but have significant bumps as a result of supplementals after hurricanes.

Next slide, please. This is just some examples.

We're not really going to be talking about unmanned systems very much, but I know the

panel is very interested in it.

These are all activities from the last year in unmanned systems, you know, associated in some way with Coast Survey.

A lot of these are our contractors, so through our contracts and working with our contractors, we've been able to find projects and apply really the cutting edge technology to problems -- really varied mapping problems around the coast.

We've had, you know, unmanned systems operations in Alaska and Florida, Great Lakes, you know, off of the Chesapeake Bay, and elsewhere.

So this is really one of the main ways that we are engaging industry in the technology sector on this, and I'm really proud of how far the hydrographic community has come in the last few years in maturing this technology.

Well, let me just say, I think we're at the pivot point now where some of these technologies are mature enough that we could take

them to scale, right?

A big slug of money invested in some of these technologies right now would be a good investment.

I wouldn't have said that a few years ago because some of them were still pretty immature, but there's some really good stuff out there.

You know, obviously we have pictures of little -- I used to say little yellow boats, but clearly they're orange and red and all that, and gray, and all the colors of the rainbow now.

But, you know, the tricky part is not making a boat that can drive around in the water, the tricky part is making it do hydrography.

And we're really investing heavily through our university partnerships and our own work, and working with the commercial sector on trying to really improve that, too, so that they're not just remote controlled, but that they're truly autonomous.

Next slide, please.

And that's all I've got, Nicole. I'll turn the gavel back to you.

Oh, wait, can I make one more point before I turn --

MEMBER LEBOEUF: Of course.

RDML SMITH: And that is now, on the unmanned system then, in general, if we go back to the NOMEC strategy, the milestones we've put out in the NOMEC strategy are simply not possible using today's technology.

This isn't just a question of throwing money at the problem until we're done.

We simply cannot do particularly the shallow half, or the shallow two thirds of the problem, which is 40 meters and shallower.

We simply cannot do it with today's technology.

And it'll only be through the continued investment in those types of systems from the previous slide, as well as artificial intelligence and new communication systems, and other types of advanced sensor technology that we

will be able to get to the point where we could have a plan where we could actually achieve that full ocean mapping goal.

So, we're going to continue to invest in this.

I hope that any investment that the federal government makes broadly will contain a significant portion for technology investment in the early years, as well.

But that's my last point, Nicole. Back to you.

MEMBER LEBOEUF: Thank you, Shep. You know, I feel like I want to almost retitle this session because of making the most of and in spite of COVID.

You all have done an amazing amount of work, innovative work, and really in ways that we could not have done without this situation.

So, congratulations to everyone. It's very impressive.

Thank you all for your attention, and to the NOS Office directors that were here today,

and to all of their invaluable work.

We are -- continue to produce top quality work despite the challenges, like I said, in spite of -- and yeah, it's amazing.

With that, let's pass it back to Chairman Saade, and let's give this the rest of our day.

CHAIR SAADE: Okay, thanks. As Nicole said, that's great stuff. It's always really nice to see the big leaps forward on the technologies.

I'll defer to Lynne real quick. Should we do some Q&A, or should we take a break?

MS. MERSFELDER-LEWIS: Q&A. HSRP, ask away.

RDML SMITH: So, just to clarify, this part of the Q&A is for the panel members only.

We'll get to public comment in a little while.

PARTICIPANT: Right.

CHAIR SAADE: Okay. So, with that, do we have any questions from any members of the

HSRP on these past several presentations?

Julie? Julie Thomas raised her hand.

CO-CHAIR THOMAS: Am I unmuted? Yes, I am. Okay.

No, Shep, can you clarify a little bit more that less than 40 meters?

I know that's a really difficult part of the nearshore.

Are there agencies, groups, academia, technologies that are actually currently being addressed to measure that part of the shoreline, or have people just kind of written it off and thought, oh my gosh, not now?

RDML SMITH: Well, I mean, my program mostly spends its time in that space because that's the navigation-relevant part of the coast.

And so, shallow water multibeam clearly works, but it's very laborious in that depth of water.

Bathymetric lidar works really well when the water is like it is right behind me here in my video, but that's, you know, not often in

the estuaries and a lot of --

(Simultaneous speaking.)

RDML SMITH: You know, I think the messaging on the 40 meters has been a little bit awkward.

We wanted to have a significant milestone by 2030, but we've recognized that that milestone could not complete everything.

But we didn't want to define the scope of the entire problem to be only do the easy part, and the part that only meets some societal needs, right?

Navigation out of our sanctuaries and marine protected areas, coastal modeling, habitats.

There's a lot of really valuable reasons to have the mapping in the shallower water, that fades away as the water gets deeper.

And so, recognizing all of those really valuable societal benefits, we wanted to keep the overall goal to be if it's water, map it, right? The whole thing.

But, to give ourselves a little bit more time, not only because it was going to take longer, but because we recognize that that region would benefit from a technology surge.

Disproportionately benefit from a technology surge in future years.

We could imagine that with a not reasonable amount of money, but an imaginable amount of money, we could do the 40 meters and deeper by 2030.

CO-CHAIR THOMAS: Okay.

RDML SMITH: We couldn't make the same argument for the 40 and shallower.

CO-CHAIR THOMAS: Right. Okay, thanks.

CHAIR SAADE: Anyone else have a question?

CO-CHAIR THOMAS: I'll go one more if no one else has anything.

CHAIR SAADE: Yeah, go ahead, Julie.

CO-CHAIR THOMAS: I was interested -- I think it was Rich, you mentioned PORTS over

AIS.

This is actually fantastic. I mean, I think a lot of people have been working a long time on that.

So, since you're bringing in the CDIP wave buoys there and integrating them into the PORTS system, do you know, are the waves also going to be over AIS as part of the PORTS there, or will they not be included?

And you might not know the answer to this, but I was just curious.

MR. EDWING: Yeah, so Julie, this is Rich. I believe they will be, but let me just double check and get back to you on that. But I believe the answer is yes.

CO-CHAIR THOMAS: And, you know what would be really helpful, Rich, is maybe to have -- you can just email me -- but if I could have a contact person in CO-OPS or PORTS who is working on that?

It would be great because we also are doing the parallel work to try to get our wave

buoys over AIS.

We have wave buoys in ports, in harbors where there are not NOAA PORTS system.

So, it would be really great to try to collaborate with what you're doing there, and make that expansive into the wave data, also.

Thank you.

MR. EDWING: Sure. I'll be glad to provide some contact information.

But really, at this point, all the work's being done on the Coast Guard side. Yeah, we kind of --

CO-CHAIR THOMAS: Oh, okay.

MR. EDWING: You know, we kind of completed what we needed to do years ago.

But they needed to make changes to their IT system and do some other things, but I'll get you some contact information so you can, you know, ask whatever questions you would like.

CO-CHAIR THOMAS: Okay, great. Thanks.

MR. EDWING: Sure.

CHAIR SAADE: Okay. We're going to take another short -- or Nicole, do you have a question?

MEMBER ELKO: If we have time, I'd like to ask a quick one.

CHAIR SAADE: Sure, go ahead.

MEMBER ELKO: Okay, thanks. So, I'm new to the HSRP.

I haven't seen all of you in person yet, and I'm looking forward to working with you, so I don't really have a great feel for the dynamics of the group because this is, you know, how I know you so far.

So, I did really appreciate the comments from Shep about the collaborations that are going on, and relative to Julie's question about, you know, the coastal zone, which is the zone I live in and work in, there's so many agencies in there, right?

There are all these interagency groups popping up right now to work on coastal topics.

And if in future briefings, it would

be really helpful for us, I think, to understand a little bit more about how you're collaborating with other agencies, and how you're building on those capabilities to avoid duplication of efforts, and just increase the odds that the new capabilities that are developed will endure.

CHAIR SAADE: That's a really good point, and we're going to have a considerable amount of time later on today for various topics, and we can all give you some background on that, as well as get your opinions on that.

But yeah, I think I can speak for everybody, we're gung-ho on all that, on collaboration and making sure we track it.

Okay, thanks. We'll break right now and be back at the top of the hour, so take about five minutes, and see you soon.

(Whereupon, the above-entitled matter went off the record at 2:55 p.m. and resumed at 3:05 p.m.)

CHAIR SAADE: Okay. We are, we have a couple of more questions that we're going to

take care of from that last session and then Kelly if you want to go first.

MEMBER KELLY: I was just trying to actually find out technically how to raise a question.

CHAIR SAADE: It worked.

MEMBER KELLY: It worked right then, but it's not the correct way to do it. I have a comment, but that can wait until later when we're doing our summary.

I'm just trying to skip technical as to if there is a question to be asked, how do we actually raise our hand and get recognized.

CHAIR SAADE: All right.

RDML SMITH: Thanks, Ed. I think Phil had one too, Ed.

CHAIR SAADE: Okay, we'll come back to you on that, Ed. We'll have a formal statement on that in just a little bit and I'll go to Sal for right now for question on the last session.

MEMBER RASSELLO: Hello. Okay. Yeah, I have a question for Admiral Smith. They've got

these I guess at 40 meters depth. And regarding the precise navigation, we're going to develop, what is the scope of the 40 meters and not 30 meters since the ECDIS reads over 30 meters inland?

I just try to understand the number, you know, 40 meters versus 30 meters would be probably more appropriate for the precise navigation.

RDML SMITH: Yeah, that's a good point. I do want to just clarify that the intent is not that we're going to stop doing navigation surveys in less than 30, 40 meters of water.

That course, is ineffective, but nor do we expect, in fact, the OPTEMPO to increase in shallow water as well, but that we don't, we'll not finish before 2030.

So the, and this is, you know, the number that was, it's a round number, frankly, taken from a wide variety of context.

And it happened to align with a level of effort study that we had done where that was a

sort of a one-third of the effort is deeper than 40 meters and that was why we, that was why we chose that.

But I agree with you that the navigation depths are all shallower than that.

CHAIR SAADE: Okay, Sal? Okay. So don't go anywhere, Shep, because all I'm going to do is say I'm turning it over to you for ocean and coastal mapping strategies.

RDML SMITH: Okay, so this is introducing what I, this is a repeat of a webinar that we did with the panel members. I mean there's really a summary of a, of the strategy that was developed and published back in June and the hope is that this is, this and the part that Juliana will be describing for the Alaska Coastal Mapping Strategy and the Standard Ocean Mapping Protocol will all be, provide some food for thought.

And maybe inspire some comments from both the members and the public. And so, we did ask the HSRP to consider making recommendations

to NOAA on the implementation plans that we'll follow, the NOMEC and Alaska Coastal Mapping Strategies.

So this is an ask from NOAA to the panel. In addition, we're using the public nature of this meeting to be one of a number of touchpoints that the NOMEC counsel will be making to gather public input in the early stages of developing the strategy.

Next slide please. So going back to last November, the President issued a policy memorandum saying that the, Presidential Memorandum saying it's a policy of the United States to act boldly to safeguard our future prosperity, health and national security through Ocean Mapping exploration and characterization.

This is a really exciting development. I don't remember the President ever talking about ocean mapping as directly as this and certainly not flagging, as you know, the links to national, to economic prosperity and national security calls, et cetera.

So the, and at the same time, the completing mapping for Alaska and the Alaskan Artic, or what we have post lag as part of that Presidential Memorandum back in November.

Between November and June, we developed and vetted through a protracted interagency process a National Strategy which is still pretty high level and that was published in June.

And then the next phase is coming up with an implementation plan which is really, okay, how are we going to do this? And as I said at the beginning, there's been quite a lot of discussion from a lot of different parts of the ocean mapping community that they would like to have visibility and a voice into this process.

And this public session is one piece of providing that voice. And we'll let you know some other ones coming up. So NOMEC is the National Strategy for Mapping, Flooring and Characterizing so NOMEC.

The United States Exclusive Economic

Zone and just to be clear, this does include the Great Lakes and does include the state waters and so it's a bit of a shorthand that strict geographers would quibble about that terminology, but the intent is to be inclusive.

We have an implementation plan. the first draft of which is due December 8th to the Ocean Science and Technology Committee with all kinds of different agencies represented.

We from the very beginning, we have been committed to being very inclusive within the constraints of the law on developing this strategy with input from the public and from our philanthropic, academic and commercial partners and so I hope we will hear from you all today.

Next slide. So goals, there's five goals in the NOMEC strategy. The first is really about a governance. Really how are we going to coordinate not only across interagency, but also the other sectors and really the big part of that is establishing the NOMEC counsel.

As Dr. Alan Leonardi, Dr. John Haines

from the USCS and I co-chair that counsel and that has just now been stood up. And our first order of business is to develop this implementation plan.

Goal two is really the heart of it if you're into mapping which is simply to map the U.S. EEZ. The first stage of that is to sort of define what sort of a standard set of protocols for what we would do together so that if we did something and USGS did something and someone wanted to let, to make an allowance and a commercial tender that we would all be talking about a similar set of ocean mapping activities.

And so that it will fit together into a seamless set of services eventually. Second is to coordinate and execute the campaigns to map the United States EEZ.

We envision this to be done regionally and for regional mapping efforts there's a lot of disparate geographies in the U.S. coasts and the stakeholders and those with capabilities in each of those regions are pretty disparate as well.

And so while that has not happened yet, we do envision a regional flavor to that. The third is to make the data usable and available.

I showed you one example of that with the National Bathymetric Source a few minutes ago, but that really only covers bathymetry. It does not cover seabed backscatter or water column data or any physical oceanography sub-bottom, et cetera, et cetera that would be part of a, you know, a Standard Ocean Mapping Protocol. So those are still open questions as to what extent we can and can't, and can make those data more readily available.

Next slide. Goal three is to, is exploration and characterization. This really is the focus here, so just a quick definition check here. The characterization -- exploration is about activities where there is less known. Characterization is observations and in excess of what might need to be done for basic mapping for a particular application.

So I could give all kinds of examples, but I don't want to get hung up on it. We sort of were giving the sort focus to that to the OEAB for their consideration.

So we've sort of de-emphasizing it for the conversation here. Although it is part and parcel of the whole effort. Goal four is about the technologies.

And we chose these verbs very carefully to develop and mature. It's this is, these are active roles we need to take. We can't just use the latest technology because we are this sector and it won't be developed if we, if it's not for us.

And so we need to be, take an active role in developing and maturing those new technologies. The, you know, that's you can imagine how it will work.

We need to identify the needs and support the development of those of the technology to meet those needs and then support partnerships with organizations that are working

on that.

And there's a lot of different ways that that can be implemented and I look forward to your thoughts on that. And then, last is a partnership goal to build partnerships beyond the federal agencies and maximize opportunities for non-federal participation.

And also to inspire and involve the public. And this is not just in this sort of in the NASA Wow! way, this is, you know, also to ensure that we're meeting the needs of the public.

And that the applications that we might derive from these activities are, the needs are being met by the larger program.

Next slide. So here I'm going to turn it over to Paul Turner from the Interagency Working Group on Ocean and Coastal Mapping who will describe the process for where we are with Standard Ocean Mapping Protocol. Go ahead, Paul.

MR. TURNER: Thank you, Admiral, and good afternoon everyone. I'm Paul Turner and I

work with Ashley Chappell with Integrated Ocean and Coastal Mapping program with NOAA's off the coast survey.

And I'll be giving you an update on the Standard Ocean Mapping Protocol currently in draft with the interagency working group, Ocean and Coastal Mapping along with contributing subject matter experts from the various science federal agencies.

And we're working towards drafting the SOMP as we've come to call it. The Standard Ocean Mapping Protocol which is in support of goal 2, the NOMEC strategy, Subsection 2.1 which basically states develop a standard ocean mapping protocol.

And within this, we are intending to establish baselines and national data standards to guide participants from federal, state and non-government and ocean mapping data acquisitions and processing.

Protocol will provide recommendations and standards, specifications and best practices.

We intend to improve communication, reduce costs and prevent unnecessary and redundant work.

The protocol is also intended to serve as a guide for all partners in the ocean mapping world which also includes exploration and characterization to ensure the widest use of data that's available.

The protocol will, at a minimum, include seven primary features which are data management and data stewardship, bathymetry data from the following sources of multibeam, single beam, sonar and lidar systems, seabed backscatter, water column data, sub-bottom profiling, magnetometer data and side scan sonar imaging.

We're going to follow and include national data standards within the protocol that align with Geospatial Data Act of 2018.

And one big goal that we're, you know, looking to include within those is to ensure the widest access and use of all of these data sources that are acquired to maximize data

stewardship and minimize duplication.

Next slide please. And to promote our protocol that we're drafting or still in the initial phase. They've really been working on this just over the last couple of months, so during the summer.

That interagency working group will be holding a virtual symposium on October 6th and 7th. I have some of the details here outlined in the slide.

But the purpose of the symposium: to enable non-federal sea quarters to learn about our protocol and provide an opportunity for comment on it.

There's a link on the slide for the symposium registration which provides brief summaries for each of the seven primary components.

We'll be facilitating lightning talks which are based on submitted topics of interest from the registration process. And we'll also be holding roundtable discussions for each of the

seven primary chapters or features to gain feedback, input and comments from the audience.

We know the academic world and the private sector have a lot to share and we welcome their input and look forward to including their feedback on the protocol going forward as we begin to draft it in the next few months.

Effectively, the purpose of us holding this event is to enable the non-federal stakeholder to hear and learn about the standard Ocean Mapping Protocol and to provide an opportunity for inclusion, further input.

That kind of brings me to the end of my slides. Thank you for your time and I look forward to any questions or follow-up.

RDML SMITH: Thank you. I'll turn this over Juliana for her to walk us through the rest of this.

MEMBER ABDULLAH: Is there a question now, Ed?

CHAIR SAADE: I was going to turn it over to Juliana, but should we go ahead and take

questions?

MS. MERSFELDER-LEWIS: Hi, you guys. No, I would say wait until the end for all the questions. Sorry about that.

CHAIR SAADE: That okay. No problem. We'll get back to you, Qassim. Well, Juliana, if you could go ahead and take the lead on the Alaska Coastal Mapping please.

MS. BLACKWELL: Certainly. I have four slides so we'll get through this pretty quickly. I basically just wanted to go through what the goals and objectives are within the goals of the Alaska Coastal Mapping Strategy.

But let me just start out by saying that we were charged with completing the strategy for mapping the Arctic and sub-Arctic shoreline, the near shore and also end of shoreline.

And really the charge is to make sure that we are coordinating with the State of Alaska and the Alaska Mapping Executive Committee.

NOAA's been involved in the Alaska Mapping Executive Committee since its inception

and I am pleased to say that we are now Co-Chair of that group and have been working very closely with our federal partners and the state partners to do a lot of the ongoing work in Alaska on the coastal mapping side and the other geospatial data sets that have been focused on.

So the four goals of the Alaska Coastal Mapping Strategy are here before you. You know, again, first and foremost, building on existing mapping partnerships.

There are a number of them and we want to make that we, if there aren't folks involved, we want to make sure that we get them involved, but we want to use what we already have in existence.

We are definitely under a tight deadline to get this strategy in place and also the implementation plan in place and making use of what we have available.

The second goal, expand the data collection to deliver the priority products that stakeholders require. What are those things that

people want most and will benefit the most?

Third goal, leverage innovation in mapping technology development. I should mention, you know, we need to continue to push this. We need to have new technology that we can capitalize on for these efforts.

And then the fourth goal, you know, the importance of communication and strategic communication to promote engagement, to include stakeholders, and to promote the engagement of those stakeholders.

Next slide, please. So the strategy itself is rather short and what it does is it goes through and identifies specific objectives under each of the goals.

So under the first goal, let's see here, the four objectives, one is to establish a team and that has been completed as you see at the bottom of the screen here.

NOAA proposed the creation of a coastal mapping technical subcommittee under the AMEC, the Alaska Mapping Executive Committee, and

that was approved and stood up.

And now they are working hard on the coordination and development of this Alaskan Coastal Mapping Implementation Plan. So we've got that one going.

The second objective is to refine the mapping priorities of our stakeholders and think about the cost and the data standards that are required.

Third, and very important, resource it. We can have a plan, but we need to be able to resource the implementation of that plan.

And fourth, integrate with other complementary priority mapping themes. Nothing is in and of itself. It's all part of a bigger system so we want to make sure where those touch points are and make sure that we're integrating the needs, and the needs and connections with other data sets.

Next slide, please. Under the second goal, objectives include having an agile plan and a campaign because we know, just like with 2020,

things happen.

We've got to be able to be versatile and have Plans B, C, and D ready in our back pockets so that when things go a different way than we planned, that we're able to make progress on things.

So we want to be able to execute an agile plan. Second objective under this goal is to make sure that we have the foundation necessary by upgrading the National Spatial Reference System components to support the mapping data acquisition.

As I mentioned in my presentation earlier, foundation cores and the NOAA Cores Network, to make sure that there are GNSS stations that are available and that we have the proper models.

And we have an updated NSRS in Alaska so that this information is being layered on top of something that is the most accurate and the most relevant in today's world and using today's technology.

And then third, to produce and disseminate the data sets and products from this mapping plan. So we want to make sure that collecting the data is one thing, but what are we disseminating out of that and how is that going to be used?

Next slide, please. So for goal three, the two sub-objectives under that are to upgrade the Alaska climatology tool for smart application of satellite/airborne lidar.

You know, we're determining, you know, what the water quality clarity is so that we can utilize that for surveying purposes and improve that tool so that it better serves us in this effort.

Secondly, monitor and test new technologies for acquisition efficiency. We need to do that throughout our operational needs, so nothing new here.

But then the coastal side is same as with the ocean side, how do we develop, monitor and test these technologies. And then the last

goal of the strategy is again focusing on the communication and promoting stakeholder engagement.

So for strengthening the communications, growing the participation, we've can only have a better product. We get the buy in, get people's input and look for ways that we can work together to implement this strategy and to use online tools and as we're doing now and technologies to communicate plans and performance.

So it's not just about sharing information, but monitoring how we're doing with things and being able to share that with a broad range of stakeholders.

So that was my last slide, but a couple of other comments I would just like to add onto. As far as stakeholder engagement, I know that there is a tentative date for an Alaska Coastal Mapping Summit. I think November 5th is the current date that's being looked at.

We want to have something that we can

invite others to from the public, from the state, from other federal entities, tribal, and make sure that we are casting a wide net and getting input through this Alaska Coastal Mapping Summit.

We're still working on that. Our plan is similar to the NOMEC plan, is to have a draft available for public comment by December 8th. So we've got a lot of work to do and a short amount of time, but I will also say that there is a great team in place.

There was already wonderful participation by a number of federal and state entities on AMEC and the Coastal Subcommittee that's been created has a huge partnership, huge participation by both federal and state entities.

They've been meeting regularly and I think I can say at this point, they are really just rolling up their sleeves and getting started in the writing component of the implementation plan.

So the last thing I'll mention is that the, I know the HSRP, several of the panel

members have been very involved in developing recommendations in the form of a white paper to present and to discuss later today and tomorrow about these strategies.

And I applaud you for all of the effort that you put into this work thus far. I'm looking forward to the discussion about your recommendations. And, you've done a terrific job in getting those pulled together and I hope that what this leads to is an opportunity to utilize your work within the implementation plan.

Because again, the rating team is just really, really just getting started so your input is very timely. Again, whatever is written and whatever we get communicated in the next couple of days, we would love to be able to pull that in and hope that you'll share with us your approval to bring that information into the implementation plan as we talk about it in the coastal subcommittee and with other partners.

And I think with that, that is all I wanted to say for now. I know we've got a lot of

conversation ahead of us so I'll end my update. Thank you very much, Ed.

CHAIR SAADE: Thanks a lot, Juliana. We've got a couple of questions lined up. Do you want to go first, Captain?

MEMBER QASSIM: Yeah. Thank you, Ed. I have a couple. One for Paul and one for Juliana. Juliana, that comment is not directly related to this, but about your comment about the postponement of 2022.

I would not feel bad about it, I think your guys did a great job in the last seven, eight years of preparing us and we waited all this time, we can wait another year or two.

It's totally understandable. I don't see anybody really going to be hurting from this delay a year or two or three. So keep up the good work. Thank you very much. Yeah.

MS. BLACKWELL: Thank you, Captain.

MEMBER ABDULLAH: And for Paul, I really appreciate all the work of Shep and everybody on this project. And you will see in

our response of HSRP, we are focusing on the importance of everybody speaking the same language, you know.

So I'm glad you brought up, you know, the protocol and the importance of developing that protocol and we hope, in a similar plan, to make interagency things, but one thing I want to emphasize, I have said to the last few weeks, you know, and I talked to Ashley and everybody, trying to get hold of a national standard for coastal mapping, you know, ocean mapping.

I couldn't find anything in the form of a standard, you know. The protocol is great and the SOMP and everything important, but as the opportunity for us to think also about it's good to be within that protocol, we refer to the national standard, the U.S. national standard for coastal mapping and hydrographic surveying for something.

I got held up by hydrographic survey specification and the developer which is great for project. NOAA tasks a contractor or they do

it themselves.

But that's all not standard. I mean standard has different definition and it would be nice so everybody uses it with our Corps of Engineer, NOAA, you know, we have them all sign on it and everybody use it in the future when we do surveys.

The, because the technology now, I mean our vision for the technology now collect it once, use it many, you know.

So having a standard where all agency collect data, collected in one way, that's where we going to make the most impact of this strategy, you know.

We don't waste resources, no two agencies go to the same coastline and fly it twice or scan it twice or sound it twice. So it's important to have a standard every -- where we match a coordinate according to that and we don't duplicate efforts.

When NOAA collect Alaska, Corp of Engineer and JALBTCX shouldn't go and collect the

same coast line because we already did it and vice versa. So that's all my comment. Thank you, Ed.

CHAIR SAADE: Good stuff, Captain. Larry, you're up.

DR. MAYER: Sure. I have a question for Admiral Smith in the NOMEC Goal 2 about coordination, execution of mapping campaigns. You mentioned the potential of taking a regional approach.

And I'm wondering what mechanism is envisioned that could take advantage of all the possible assets. In a sense it's a twist on kind of the other direction of customs questions.

For when we have such a huge task and there are many, many assets out there. There are federal assets, state assets, academic assets, private sector, co-interactive organizations.

Have you thought about what mechanism could potentially coordinate amongst all of those different assets to truly get a coordinated program going?

RDML SMITH: Well, sir, I think that is the question that sort of underlies the whole thing and I'm hoping to hear your ideas first on what that looks like.

We really have cast about for what another part, another example of how this is done in another sector. We really haven't found one that is, you know, that really does that really well.

And so, I think we're going to have to invent it. And I think part of the reason that we do want to think regionally at least for priorities and designing campaigns is that we'll never get the Artic people to get or see interest in the Great Lakes. Right? And the Gulf of Mexico and vice versa. Right?

So we would just waste a lot of time talking. If we had everybody in the room, we would never be able to get to the level of detail to be able to do anything meaningful regionally and to really think these things through.

DR. MAYER: But you might have an

artic vessel that's setting from the artic to the Antarctic that can do a lot on the way.

RDML SMITH: Sure. Sure, and obviously there are organizations like mine that have national scope, right. And we would need to be involved everywhere.

But I think there's a, you know, a lot of this comes down to money in the end and we're really trying to build as many as much flexibility into how we can use, you know, resources to get this done.

So I know one of the things that I've always regretted is it's very difficult to just add a little bit on to an existing research cruise that is already, already has or has already done all of the logistics, the machinery works, the people are there, all they want to do is buy three more days.

And that is the way that we're structured for an environmental compliance and Federal Acquisition Regulations and everything else. There are a lot of barriers in place.

So we're looking at how to erode some of those barriers so that we can take advantage of opportunistic efficiencies. And, but I think this sort of needs to sit on a foundation of stable capability and capacity in both the government, commercial and academic fleets and the philanthropic.

And there's plenty of work to do. Right now, there's not enough money to go around, but I'm hoping that the longer as this conversation goes on that we'll be able to get the scope right.

DR. MAYER: All right. Thanks.

CHAIR SAADE: Okay, Sean Duffy's up next. Sean, you might be muted.

MEMBER DUFFY: Hello, Ed.

CHAIR SAADE: There you are. Go ahead please.

MEMBER DUFFY: All right. So really great, you know, panel today. A couple of times things came up that I wanted to comment on, but I figured I'd save them for the end.

And first all, being in the Gulf Coast region I would have to thank what I always call the NOAA Swiss Army knife.

We've had multiple benefits and calls with NOAA National Weather Service as each system has approached and had to take efforts to shut down the Mississippi River for navigation.

Luckily, and I hate to even say it, but for us the storms went different ways, but we've had a, you know, very active season.

A lot of impact and I think I'll come back and, Shep, in some ways just touched on what I wanted to get to, but I remember from the Presidential Directive that there was a questioning about appropriations and being consistent and as we heard some of the discussion about increase in PORTS sensors.

Unfortunately, local impact means we have challenges funding the sensors we have on the Mississippi River and I know that throughout the program, that's happened in other areas.

And I just want to look back at the,

you know, the statement that I say a lot is, you know, is full funding floats all boats and I'm wondering if, you know, there and I know some of this is managed in programs that have already been run and a lot of great work has been done, there's a lot of partnership.

But in the end, I think it's the funding, consistent level of funding, increased level of funding. Without a budget increase doing more at some point this becomes impossible even with the public-private partnership.

And I just wonder if some of the increases will fund this and come back to those questions related to what having the authority is great, but sometimes without the appropriations, you can't get there.

CHAIR SAADE: Okay. That's basically a statement or you looking for an answer?

MEMBER DUFFY: If there's an update on where funding will come and I heard, you know, we have the potential for a CR and stopgap measures, but what can be done with the directive in ocean

mapping without increased funding?

RMDL SMITH: I'll take that and in a public forum, this is, I need to tread this ground carefully. But the way it has been described to me and it makes sense is that well, you know, we had this vision last, you know, last November of a strategy in July, we have an implementation plan in December.

It's really only when we have an implementation plan where we know who needs to do what, can we think about funding anything. Otherwise, we're just kind of throwing money at a problem rather than investing in a well-considered implementation plan.

So I, you know, I hear you and so that's sort of the way I see this playing out, is, you know, the implementation plan is the roadmap for investment.

And so we want to put the building blocks in there upon which we can scale a program to the size we envision for, to meet these goals.

MEMBER DUFFY: I appreciate the

complexity of that answer. Thank you.

CHAIR SAADE: Okay, we have time for one more question from Lindsay and then we, and then Shep's going to moderate our public comment period. So go ahead, Lindsay.

CO-CHAIR THOMAS: Lindsay, you're self-muted.

MEMBER GEE: I'm off. I'm up now. Sorry about that. I'm technology challenged. It's a comment and a question for Shep I guess.

As we all, obviously as Ed said, the ocean's having a moment and we fully support that and I think the way I see Shep embrace this is great and I'm waiting for the officers' coast survey to be turned into the ocean and coast survey.

But I just had some concern I guess and question, I guess of how he's going to balance -- we talked about the under 40 meters and then the over 40 meters and that technology and we'll support that acceleration of the, you know, under 40 meters.

It will be in parallel, but you'll see it accelerating under 40-meter areas in the future after we've kind of got the deep stuff done, but still doing it in parallel.

And it seems from the Coast survey perspective, you're planning to be involved obviously, in the deeper water and I just wonder how you balance that up and just not keep that real momentum you've had in the shallow water going under 40 meters?

RDML SMITH: A great question Lindsay and I, in the public comments that we've already received and things that I've heard from our stakeholders on the side is they are, there's a real concern, particularly navigation interest, but others as well, that you know if we all march to deep water that the shallow water applications will be neglected.

And so I do want to sort of clarify that it is not the intent of the strategy and certainly is not my intent to redirect the resources that we have already, that we already

use for shallow water work in partnership with others and for strictly navigation purposes to deep water.

But that we have a scalable capability and capacity where we could add additional activities on top of our foundational activities that would allow us to do more and then we could do some of that in deeper water over the course of the coming decade.

So it's not, I don't think that was a judgment on anyone's part that the deeper water was more important. In fact, most judgment is the opposite.

But that it is easier and we can build momentum for the program and that we can take advantage, just the proportionally in shallow water from technology advancements in the coming years. I don't know what, does that sort of answer the question?

MEMBER GEE: It did. It probably answers the question and we're the same, we want to lead the hard bit for you guys, but in

realistically, if you can get more reasonable so then you can top up your foundational funding anyway, why would you put that into the deep water and not just put more money into the shallow water I guess would be the question that I would consider, but --

RDML SMITH: It depends on what the note states that was attached to the money. Oftentimes there's a little note that comes with the money that says what the intent is, so.

MEMBER GEE: Right.

RDML SMITH: If it's pretty broad, I expect a good balance between shallower and deeper, in the context of regional campaigns with the goal of getting it all done.

And I think that's the bottom line is that the plans have to envision the completion. And we're trying to get away from the little postage stamps. You know, because that just will never add up to done when summed together over decades.

MEMBER GEE: Okay.

CHAIR SAADE: So Ed, is this now public comment or we going to general H and sub-B comment for the strategy and service?

MEMBER KELLY: No. I jumped the gun by about an hour so you guys can go on from there.

CHAIR SAADE: Okay.

MEMBER GEE: I did have one other comment, well comment and question I guess with regarding the, like the focuses on mapping is a great word, but it's an unfortunate word because it's a product, you know.

And people understand mapping, but they also misunderstand it. And it's been mentioned about the different parameters that are going to be observed and really, we're talking about kind of the acquisition and then use of the data.

And I think one of the areas that's difficult to manage in that and you know we have the bathy gap analysis that's being held up, you know, to say well here's where our gaps are. And

that's kind of concerning.

It's great if there's a gap because that's easy. One of the problems is it is just a holding at NCI which is raw data and it has no quality assessment.

So in the areas it shows as having data, it can be a problem and I give an example of that.

Where work done at the Nautilus Ocean Exploration Trust is working off the west coast this year, we are actually exploring areas with the Sanctuary and OER off the west coast in deep water.

But in accordance with the bathy gap analysis, you know, it's done. But it's not done in preparation for the exploration that we're talking about and so there is an interagency group that we work with to find what's really required for the exploration.

I think that's a key aspect we kind of say, well, you know, the foundation is the map, but in a way, we haven't really defined, I think

it's important for implementation to clearly define what we mean by that.

And that's kind of what's the data, what's the account, how we're going to distribute it.

And it seems like it almost needs to wait for the OER to kind of, all the same, well here's how we're going to characterize it and then it's like, okay, this is what we need to characterize it.

So that was something I think we fully support. We want to get it mapped and it's like, okay, what do we really mean by and that and how are we going to get that done?

How are we going to present that? And you mentioned, you know, the backscattered national bathymetric force and I think combined with geometry is great, but your backscattering and sub-bottom and how do we really say we're done, like, even by 2030?

It's a question for, I guess, maybe Shep and also Paul Turner.

RDML SMITH: I don't want to reply to every comment because it will take up half the time, but I do, Lindsay, I think that's a really important point. And the definition of done that's in that gap analysis is very crude.

It's tied sort of to the Seabed 2030 model which is just do we have anything? And it does not mean that it is sufficient for any particular purpose.

In fact, a lot of it is insufficient for navigation, for instance, but we have something. So I think it's a really important point going forward, that we need to document, we need to have a -- we might need to update that definition of what done means for NOMEC that, but here's just one little cautionary note that is, if we define it, if we set that bar too high and then we do a gap analysis based on that criteria, we will have, our gap analysis will show zero percent done.

And I don't think that that's a really sellable place to start this program because I

think we need to give enough credence to the data that we already have. So I think there's a balance in there somewhere.

MEMBER GEE: Yes, it's almost like you talked about regional kind of campaigns, it's almost regional definition of what's required in each area I suppose as in the shallow versus deep in the Pacific versus the Gulf of Mexico and depending on conditions.

Maybe that is one of the areas that helps define what parameters you need to say as the minimum set under this federal program for mapping, for the exploration, what is the minimum set of your parameters?

It might not be across the whole EEZ, but it's going to be different at different places and it's just I think that's the experience we've had depending on where your, kind of, exploring.

Those that are leading the exploration kind of need different parameters so I think that's an area that implementation needs to think

about. Thanks.

CHAIR SAADE: Okay. I'm going to interrupt here because you're going to be back on in just a couple of minutes, Lindsay.

MEMBER GEE: Okay.

CHAIR SAADE: In another role. And then thanks for all of that. Juliana, I'm sorry. Nicole has a couple of comments.

MS. LEBOEUF: Yes, thanks, Ed. Just real quickly and to reinforce a lot of Shep's -- or replies there, you to Sean's question and Lindsay to your comments, these are exactly why we need to HSRP to provide us with input on these plans.

Whether it has to do with the different definitions of done or the definitions of the verbs of mapping, characterization, order of operation, all of these comments that you raised are part of or have been a part of our internal discussions on the development of these plans and the rollout of the plan.

The good news, of course, as Shep

mentioned at the beginning is that we have a Presidential Memorandum on the work that we do and it's drawn a lot of attention toward it.

It has encouraged and, in some cases, kind of forced conversations that need to happen, but we need your input on the refinement of these areas of work and helping us to prioritize these based on our, you know, initial work at it.

We do recognize the difference as Shep pointed out, between the shallow water work and the deep water work. There are different purposes and objectives and costs per unit effort, et cetera.

And having these plans and having your info on them will allow us to have more sophisticated conversations with stakeholders and with appropriators and with other about how to prioritize these items.

So we welcome that, but it is a lot work and a lot of discourse, but we do welcome that and just, you know, very pleased to hear your comments and your questions.

Sean, because we don't have new money pouring in at this moment, but we are having conversations and we can point to this memo, we can point to these documents and hopefully we can point to your input and say this is what people care about.

CHAIR SAADE: Okay, good. Lindsay, stay on. And Dave Maune and Julie Thomas, if you could join. We'll have a little mini panel here to continue discussions regarding Alaska and NOMEC.

So now, Lindsay, you can ask your questions of yourself.

MEMBER GEE: Good. I guess I did have one comment so I was going to have another comment and then for Paul and I know there's and we just keep hearing it, and I acknowledge that there is obvious outreach for involvement of the community from industry, academia and, you know, nongovernment and those to be involved.

I'm still interested to know if particularly for the SOMP, which is kind of

developing a community standard and it's not, seems like it's not allocating funding and I wonder why there can't be other nongovernment people involved in the development of that and sitting alongside and having kind of ownership.

And I don't personally want to be involved in that, but I think it seems like there is a lot of expertise outside the government in developing protocols and they're already in place in different areas.

And is there no way that there can be that group that's not potentially like an advisory board that's formally appointed like ours that can sit alongside that group in the development that then can develop the SOMP.

But I'm not sure who that question or comment is for, but.

MR. TURNER: Lindsay, I think you were asking me initially, but maybe perhaps the Admiral could weigh in, but you're right, there is no additional funding for the SOMP or the protocol.

And we have, there has been some discussion as to how to best involve the nonfederal side and that has yet to be determined. We're still in a very initial phase of drafting that protocol.

In fact, we haven't even begun to write it yet. We were waiting to hear all the input and feedback from the symposium that's coming up in two weeks before we begin to actually draft anything.

So there's still time to potentially include another review cycle from the non -- you know, the nonfederal side.

MEMBER GEE: Thanks.

CHAIR SAADE: Julie, you want to take the lead on this and --

CO-CHAIR THOMAS: Sure.

CHAIR SAADE: Okay.

CO-CHAIR THOMAS: I'll have a comment first. And you know, I feel a little hesitant about even saying this because I've been out of touch with the mapping things now for a few

years, but it was really frustrating when we were flying lidar in California doing a lot of mapping on the California coast.

As far as even the quality control checks were so different between who was performing the mapping and, you know, we, so this is where I'm going with this. Is that we actually did QARTOD for the physical parameters and biogeochemical parameters in 2001.

We met at NDBC and it was feds and academia, private partnership and we formed this group for the Quality Control of Real Time Data and we actually didn't specify resolutions because that does depend on the region.

It depends on the instrument, but we at least established what quality control measures would be looked at and therefore wave data, current data as it goes through the federal pane getting out to the National Weather Service at least it allowed nonfed partners to contribute.

And you know that the quality control

is all at the same level. And that has been our effort since 2001, 19 years we're still working on some of the parameters, but it was a way of bringing together fed and nonfed partners.

And we actually got the manufactures at the table for each perimeter waves, currents, wind, et cetera. We got the manufacturers there.

Nortek, Teledyne RDI, Datawell, we got them in the same room and said okay, what are the minimum criteria for the quality control that you need?

So like I say, maybe this is being done at the mapping level, but it seems like it's still kind of all over the place and I think that standardization is so important, otherwise you have no interoperability, you have no way to really tell what's been collected. So that's my input here.

Who else wants to talk? Anybody else have questions, comments?

MEMBER ABDULLAH: I guess, Julie, I can add a little bit to your, I mean I think the

concern that Admiral Shep brought is a valid concern. How are we going to do it?

And I think the strategy is very clear actually in the five goals. In goal five, it says both public and private partnership to map, explore and characterize the U.S. EEZ.

And goal number two, coordinate and execute campaign to map U.S. EEZ including aggregating the agencies involved in mapping.

I think it's going to take a village. We don't want -- I don't want NOAA to feel this is on their shoulders only. I think there is private-public agency, I mean, they need to sit on the table with equally weighted exchange, brainstorm.

Divide, you know, divide and conquer. You focus on the below 40, I focus and we bring, we pool the money, the resources, everybody has chunk little bit here.

Without that dialogue and openness and honestly about it, I think it will be very difficult for anybody to execute this strategy.

The only way to bring it is to bring that right people around the table whoever they are, whether other agency, other company, private and things like that.

So I'm just emphasizing what the strategy says and switching us to build that public-private, academia, agency and to get the resources. Don't do it alone. Thank you.

CO-CHAIR THOMAS: Okay.

MEMBER MAUNE: This is Dave. Julie, you mentioned quality control procedures and in the topographic arena, we've had very well-established procedures for relative accuracy between overlapping flight lines and procedures for testing the absolute vertical accuracy of points from topographic lidar.

When it comes to bathymetric lidar, it gets more complicated because it's very difficult to have good control points out in the middle of the ocean.

You can to a certain shallow waters where you can get out there or off the ends of

docks and things to measure the depth of the water and to put in absolute control points from the bottom of the ocean floor, but that only works in shallow water.

I may as well continue here in talking about the Alaska Coastal Mapping Strategy. That's one of the two topics raised by the Presidential Memorandum.

Members of the HSRP may recall that a year ago we were talking about developing an HSRP issue paper on the Alaska Coastal Mapping Strategy.

At that time, we did not know that a Presidential Memorandum was going to come out on this particular topic. I knew that an Alaska Coastal Mapping Strategy was in progress of being developed by people working with the AMEC.

And so they went to work when they got the Presidential Memorandum coming up with the strategy that was addressed this summer and now the HSRP, rather than having a two-page issue paper, we saw that the issues were much more

complicated than what we could put on two pages.

And so we put together a 20-something page, very comprehensive paper on addressing the various goals and objectives of the Alaska Coastal Mapping Strategy.

We got a lot of input from HSRP members. I think nine different members contributed to a paper that I think we're going to discuss tomorrow, but we're certainly excited about the Alaska Coastal Mapping Strategy and felt that the HSRP can be influential in influencing the implementation plan that's to be developed by December of this year.

CO-CHAIR THOMAS: Great. Thank you, Dave. Yes, that is a good interjection to what we're going to be discussing tomorrow.

So we could do a couple of things here, I guess. I know that Qassim has a few comments that he wants to make. I think we have some time. So, Ed, if that's okay, maybe we go ahead and have Qassim.

Qassim, did you want to talk a little

bit about the overall view of general mapping?

MEMBER ABDULLAH: Absolutely. I just want to highlight the situation of COVID-19 and how the federal agencies are performing greatly.

I mean, I think they've been pushing forward with all these coastal mapping, whether NOAA, NGS definitely, USGS, Corps of Engineer, JALBTCX, I mean, there is so many going on whether in Alaska or in the Pacific.

In the last eight, nine months there is a tremendous amount of work done in that partnership, that's the partnership we're trying to build between, you know, private and public because none of them can do what they're doing without the others and I think this is proving during this difficult time of COVID that is serving everybody.

So we just, I just want to give shout out to the federal agency helping the industry pushing work to them and to the private industry who completing it through this difficult time.

Mobilizing people to the field and

collecting data and the processing data so as kudos to both of them. That's all I need to say, Julie. Thank you.

CO-CHAIR THOMAS: Okay. Great. And I think we're going to take time to actually go through each HSRP member right now and just let's talk about the Alaska Mapping since Dave has already introduced that one.

We have received several comments back on the Alaska Mapping. I know that Qassim has given us some, Nicole, Ann read through it, so there are really different ones.

And so I was just wondering, let's see, I'm just going to go alphabetical down the list. We're going to, so this is focused on the Alaska one now.

I think you've all had it in your package and I think you've had a chance to read it. Ed Saade, did you have any further comments on that?

CHAIR SAADE: No. I'm okay on that.

CO-CHAIR THOMAS: Okay. And Qassim,

did you have anything further?

MEMBER ABDULLAH: I'm fine, thank you, Julie.

CO-CHAIR THOMAS: Anuj? Oh, I guess we need to unmute the panel for this one. If you don't mind.

MS. DENTLER: Yes, he's unmuted.

CO-CHAIR THOMAS: Okay. Anuj, are you there? Are you still muted or we'll come back? Sean?

MEMBER DUFFY: Hey, Julie. So I would just say that, you know, this is of course, outside of my area, being in New Orleans, but you know, I was able to help with the paper.

I've seen a lot of improvements and, you know, this is where like together everyone achieves more, my TEAM acronym, and happy to have contributed with some language.

But beyond that, I think it's very well done and I appreciate all Dave did to get us to this point.

CO-CHAIR THOMAS: Great. Anuj, I see

you on now. Are you there?

MEMBER CHOPRA: Yes. Thank you. My apology for my electronic challenges, but all good. Now I think for me it was a learning experience.

I thought it's really amazing to see so much being done in this COVID environment by the NOAA team so they, congratulations to them.

All of us are challenged. We understand the challenges we have. On specific to the NOMEC policy and the Alaska Coastal Mapping Strategy, I think as much as we can participate as a group and support them, I think that's the way to go. That's what I'm -- that would be my focus. Thank you.

CO-CHAIR THOMAS: Okay. Thanks. Thanks, Anuj. Nicole, did you have any further comments on the Alaska?

MEMBER ELKO: Sure. I would just like to say that it was really helpful to hear from Juliana. The overview, you know, when you read them, it's one thing, but getting it from the

source like that was extremely helpful.

So thank you for that. And, you know, from my perspective as a representative of a national NGO that focus on shores and beaches, I think a lot about engaging stakeholders.

You know our specific stakeholders are the coastal communities of the U.S., so I love the fact that the Alaska study didn't wait until the last bullet to say engage stakeholders which is what often happens with these. You know building on partnerships was the very first thing, so kudos on that.

And I did have a question if there's time regarding the subcommittee that was formed under AMEC. It was mentioned that state and federal agencies are starting to work together on that to begin drafting and I just wondered if there is representation beyond that, if it's allowed or are there stakeholders, is industry in?

I'm sure there's, there are community members involved.

CO-CHAIR THOMAS: Dave, do you know about that or Juliana or Shep?

MEMBER MAUNE: I would recommend that she contact Ashley Chappell because Ashley is working with the people in Alaska on that.

And I know they are seeking input from a lot of people and so if you need the email address for Ashley Chappell, I can send that you, Nicole.

CO-CHAIR THOMAS: That's right. Ashley couldn't make this meeting, but, oh, Juliana might know.

MS. BLACKWELL: Yes, Ashley is the Co-Chair, one of the Co-Chairs for the Coastal Subcommittee under AMEC, and again the group is working with a counterpart within the State of Alaska also as well as having representation on the subcommittee from Alaska.

They're also working it from their Geospatial Council perspective and trying to engage other locals, travel, native Alaskans.

And I can't speak to the private

sector component to it, but I think that's one of the reasons why they want to make sure at least that there is an opportunity through the Coastal Mapping Summit.

And there may be other venues that are, where the net is case wider and I think as Dave mentioned, you know, Ashley is really the focal point for coordinating this effort from the NOAA perspective.

And we can certainly follow up with you with some more details shortly.

MEMBER ELKO: Great. Thanks.

MEMBER MAUNE: This is Dave again. Juliana mentioned the Alaska Coastal Mapping Summit, she said it's scheduled, I think, for November 5th.

I've been to the last two summits and it really is a wonderful opportunity for people from every place to throw in their ideas and to interact and to collaborate on how to solve this problem together.

So I strongly encourage everybody to

sign up to participate in that summit when it comes out.

MS. BLACKWELL: We'll definitely let you know.

CO-CHAIR THOMAS: Great. Thank you. Okay, I'm going to continue to go around and then we'll come back to you, Dave, to get kind of a high-level overview of your paper here. Lindsay?

MEMBER GEE: Julie, I'm sorry. I have no further comment on the Alaska Strategy. It's a great job, Dave, thanks.

CO-CHAIR THOMAS: Okay. Thank you, Lindsay. Ed Kelly?

MEMBER KELLY: No, I think the Alaska's really working well and I'm really impressed to see the public-private involvement in this.

I think that's something that HSRP has been promoting for years. Nicole had, you know, mentioned that she's brand new to this, but this is my eighth year and I just realized this is probably my last, you know, meeting and dammit, I

never did get to Hawaii. You promised me that and that's how I got onto this thing in the first place. So I'm kind of disappointed with the whole thing, but, you know, I've really been impressed again.

Everybody is beating it to death, but COVID has really moved the goal posts this year and I'm very impressed to hear all the progress that has been made despite COVID both internally and with the vast expansion here into the public-private and that's again bringing us back.

I'm glad that we kind of keyed off with blue economy. That's kind of what I think we're all about. It's cleaner, safer. There's extensive societal benefits. We mention a lot of money. I think the economic impact from what we've seen from the commercial activity and the ports activity, I wouldn't doubt it's even bigger than that.

And coastal resiliency is really coming under the spotlight so I'm really glad to see how we're approaching this and I think a lot

of this progress and the perspective of how we're approaching some of these is really coming on target with these latest two pieces.

Perhaps, you know, Alaska will be the beneficiary of increased technology, better public-private interface, data sharing so hopefully we're coming where, you know, we're moving these projects faster and better.

And I'm just very happy with it. I think the Alaska paper is kind of the evolution of what we've been working on for these past few years so I'm very pleased with it.

CO-CHAIR THOMAS: Great. Thanks, Ed, for your comments. Ann?

MEMBER KINNER: Yes, is this thing on? I had to go a headphone.

CO-CHAIR THOMAS: It's good.

MEMBER KINNER: I'm hoping you can hear me. Okay. No, the Alaska thing to me is of particular interest because something that I saw, and I think it was in a Harbor Safety Committee Summit, where there was an AIS image showing the

amount of traffic that is operating in and around the Alaska Coast, particularly the north side. And to be able to really provide good charting for navigation safety up there is really important.

And as far as the blue economy, I know from the people that I deal with who are buying charts and want to be able to navigate safely up there, that it's critical that we give them the best possible information so they can continue to do what they're doing, whether it's fishing or exploration or just general shipping.

So I like the way the paper's gone and we can talk about it more tomorrow, but I'm really glad to see the focus on Alaska.

CO-CHAIR THOMAS: Okay. Thank you. Let's see, Dave, I'll skip over you. Anne McIntyre?

MEMBER McINTYRE: Okay. I think I'm unmuted. You know again, this is not my area of expertise, so I'm just going to say I'll say what Ed Kelly said, everything that he said was just

great. And just again what just struck me about everything this morning is how fast technology is moving. And it's just so impressive how everybody is embracing it.

CO-CHAIR THOMAS: Okay. Great. Thank you. Ed Page? You're muted. You're muted.

MEMBER PAGE: Am I still muted? I'm unmuted?

CO-CHAIR THOMAS: Good.

MEMBER PAGE: I'm good. Okay, well, I'm feeling love. From everyone talking about Alaska, this is pretty neat. So I appreciate that.

Evidently the President read our policy memo last year when we talked about more charting in Alaska, so I'm glad he read our HSRP policy memo which is really being implemented on at a grand scale.

It's still the last maritime frontier and there is increased shipping activity, so clearly looking at this area and trying to get it on par with the rest of the United States

probably makes some sense, at least from a very selfish perspective from my end, but nevertheless.

So I think the paper is very comprehensive and very good and it's a good game plan to tackle some of the challenges of you know charting Alaska, prioritizing and vetting ideas, and providing local input.

It's a very challenging region maritime wise as far as we had a tanker run aground a year ago or so that ran aground and the last charting was like 1900.

So you know, things like that and we have earthquakes and other things that kind of change the topography, et cetera, so it's good to see it happening.

So I'm pleased with what we've got developing here --

CO-CHAIR THOMAS: Great.

MEMBER PAGE: -- and all the energy and attention so. Glad everybody else loves Alaska.

CO-CHAIR THOMAS: Okay. Gary?

MEMBER THOMPSON: I think most of the topic has been covered. I like the public-private partnership discussion and I especially like the comment about collecting the data once and use it for multiple applications.

CO-CHAIR THOMAS: Right. Okay, Dave, I know that you've received some outside comments also and maybe you want to just give kind of a brief overview of this paper for the public comments portion of it.

MS. DENTLER: Excuse me, Julie. We also want to ask Sal if he has anything.

CO-CHAIR THOMAS: Oh, did I skip Sal. Oh my gosh sorry, Sal. I apologize.

MEMBER RASSELLO: It's okay. I think that the Alaska project is a great work. I think it's achievable due to the fact that there is a lot of interest from the public and private sectors and also because there's not much COVID over there.

So I think we are at a good point with that project. And also, because it's already

started, I think it was 40 percent of any map so we already have a base to work on. Just to do a better job of that.

CO-CHAIR THOMAS: Great. Thank you, Sal. Okay, shall we go back to Dave, or Juliana?

MS. BLACKWELL: Julie, if I could just follow up on some of the earlier comments. I'm getting some feedback from Mike Aslaksen who wants me to point out information regarding your comment about lidar.

I believe it was from the efforts in the California area from a few years ago. Mike is mentioning that a lot of the issue have been resolved through this National Coastal Mapping Strategy and, in particular, looking at things about total propagated uncertainty for lidar and so basically identifying what all the different error sources and what those accuracies' estimates are when you consider the platform, you consider the sensor that's being used, you consider your GPS error, you consider all the different pieces so bringing that all together

and studying that, and making sure that there's a better understanding of what the total propagated errors -- uncertainties are and then also aligning the requirements with terrestrial standards and things that are being done on land, such as the 3DEP effort.

So I know it gets pretty technical and it's probably something that we can discuss off line or have a follow-up discussion on to get more into the weeds on the technical aspects of this.

And so maybe that is something that comes out of the discussion that we're having today and following on tomorrow, but definitely wanted to make sure that we can bring the right people together to have these more technical updates on what's happening in that world of collecting data with lidar along the coast. Thank you.

CAPT ARMSTRONG: Julie, this Andy, and I don't have anything to say at this point, but I wonder if Larry Mayer might.

CO-CHAIR THOMAS: I was going to get to you two actually. I just turned the page and I saw your names there. So sorry.

CAPT ARMSTRONG: Thank you.

CO-CHAIR THOMAS: Larry?

DR. MAYER: I'm coming on here.

CO-CHAIR THOMAS: All right.

DR. MAYER: No, I think the Alaska strategy has really come together really nicely so I'm pleased with that. I don't know if we're commenting about the NOMEC and everything else too or that we're focusing just on --

CO-CHAIR THOMAS: Let's just do Alaska right now. One at a time.

DR. MAYER: Yes. I think Alaska's been covered well and I'm very pleased with what's evolved.

CO-CHAIR THOMAS: Okay. And, you know, before we turn it back to Dave for the outside comments, I mean, there is Juliana, and Rich and Shep, of course, if you have any comments on this then you're more than welcome

too. And Nicole and Dr. Jacobs if there's anything that you want to comment on this? Don't hear any comments. Okay.

MS. LEBOEUF: Nothing else from me, Julie. Thank you.

CO-CHAIR THOMAS: Okay, Nicole. Thank you.

MS. LEBOEUF: It takes a moment.

CO-CHAIR THOMAS: I know, I know. I'm not quite sure how to do this efficiently here. I guess we can go to each person. Rich, do you have anything?

MR. EDWING: Nothing. I'm here.

CO-CHAIR THOMAS: Okay. Great. Thanks. And, Shep, do you have anything?

RDML SMITH: Just on the Alaska Coastal Mapping Strategy. I think the focus quite rightly is on what we can get remotely sensed for the first pass and to get it really locked down with, you know, tidal and geodetic datum control.

But I think it's worth keeping an eye

on the extent to which the navigation needs in nearshore will be met. In many places where bathy lidar will not be, won't provide meaningful coverage offshore.

And so I think we need to keep an eye on that as we go forward.

CO-CHAIR THOMAS: Okay. Thank you. Juliana, did you have anything further about, particularly about the Alaska one?

MS. BLACKWELL: Nope. I'm all good thank you.

CO-CHAIR THOMAS: Okay. And Dr. Jacobs are you still on?

DR. JACOBS: I'm here.

CO-CHAIR THOMAS: Okay.

DR. JACOBS: Nothing from me. This, all of this feedback is really good to hear and very helpful.

CO-CHAIR THOMAS: Great. Thank you. I'm going to turn it over to you, Dave.

Do you want to give a real overview of the paper and also when we may be mentioned

public comments that you've gotten for it?

MEMBER MAUNE: Okay. How much time do I have? Is this a one-minute thing or a 10-minute thing?

CO-CHAIR THOMAS: I think it's about a five-minute thing.

MEMBER MAUNE: About a five-minute thing. Okay.

MS. MERSFELDER-LEWIS: You guys, you have about 10 minutes. You can just do that, if you want to go a little bit less if you want to have any questions.

CO-CHAIR THOMAS: Five to 10 minutes.

MEMBER MAUNE: That's fine. We started on this a year ago with the HSRP issue paper on the Alaska Coastal Mapping Strategy and then I mentioned a little bit ago that a lot changed since the Presidential Memorandum.

And now our two-page issue paper has gotten to be 20-something pages long, but it got to be six pages longer because I discovered that our own Dr. Larry Mayer did a National Research

Council study on this back in 2004.

And I just had to include his recommendations there because he was dead on 16 years ago. And, I'm sorry Larry that it's taken us 16 years to get this far, but I appreciated seeing your comments.

DR. MAYER: I was only 12 at the time, too.

MEMBER MAUNE: And I am pleased that 11 of the HSRP members contributed something that I was able to incorporate into the study and then we received some outside comments.

Particularly, I wanted to mention Molly McCammon from the Alaska Ocean Observing System. She gave me some recommendations and I got a recommendation from the Alaska Water Level Watch and so we have incorporated all of those recommendations.

We're focusing a lot on the need to establish vertical datums in Alaska where they are missing. The VDatum transform tool doesn't work other than Southeast Alaska and we need

GRAV-D finished up there.

But a lot of this is necessary because right now we don't know when high tide is and when low tide is for a lot of Alaska.

And to obtain this data efficiently, we need to acquire topobathymetric lidar at low tide when most of the water is out of the way and so we can actually map the exposed bathy surface.

And then we need to collect near shore bathymetry from manned or unmanned surface vessels with sonar when it's at high tide.

And so, a lot of this needs information on when is high tide and when is low tide at various portions of Alaska so that's a main part of our focus on priorities.

We have several dozen recommendations here on each of the -- there are 11 objectives in this strategy that came from NOAA and we made comments on many of those.

I don't think I want to go through all of these individually. They have been out there for members to review for the last few weeks.

We've had several HSRP working group meetings in which we've gone over this so this has been fine tuned up to today. We've actually had three different versions of the latest paper changes today.

Three changes today with info we got just today so we're ready to talk about this tomorrow and to have further discussions if you want to go into greater details.

But I really wanted to thank everybody that contributed to this. Particularly Qassim Abdullah and Gary Thompson. Because the three of us have experience in coastal mapping and it was logical for the three of us to work together to try to develop this Alaska Coastal Mapping Strategy.

I know that Qassim, Gary, and I are proud of this strategy and I've heard nothing but favorable feedback from everybody else that has reviewed it.

And so I just want to thank everybody who contributed to this paper and say it was a

group effort and I think it's, we're going to have some good recommendations going forward.

CO-CHAIR THOMAS: I agree, Dave. Really nice seeing everybody come together on it and you've done a great job of incorporating all of the comments and getting a diverse group coming together there.

So let's see, I think, that is, we will just, we won't start the NOMEC right now. Lynne, is that correct? Oh, Juliana has one. Yes?

MS. MERSFELDER-LEWIS: You guys could have another comment for six more minutes?

CO-CHAIR THOMAS: Okay. All right. Anyone else? Let's do Juliana here.

MS. BLACKWELL: I'll take a minute.

CO-CHAIR THOMAS: Thank you.

MS. BLACKWELL: I just wanted to make sure everybody is aware that the Alaska Coastal Mapping Strategy is an interagency strategy.

So while NOAA is certainly prevalent in it, we are, it is something that was put

together with our partners, not something that is just truly a NOAA strategy and I think Dave referenced that.

And I appreciate you, Dave. Referring it to NOAA's work on it, but it is something that I just want to make sure that we incorporate the fact that it is interagency.

MEMBER MAUNE: You're right. Thank you.

MS. BLACKWELL: Let's see, trying to think if there was anything else. Anyway, maybe this is a follow up to that and what I mentioned earlier is, you know, I know that there's a lot of great detail in the white paper. And it is a lot longer than the strategy itself and we're hoping that the information that's in the white paper, that HSRP, when you're ready, that we're able to use that information in total in the implementation plan and share that with the other entities that are a part of this Coastal Subcommittee so that they are able to reference it and work together with us and coming up with

the implementation plan.

So I don't know if that's clear or not, but we want to be able to take this that, what you're talking about and bring it back to the subcommittee for further discussion and consideration for the implementation plan.

And I'm pretty sure that it's going to be well received, but just want to let y'all know that it's a multiple step process for us.

MEMBER MAUNE: Certainly. That is our intent.

MS. BLACKWELL: Okay. Thank you.

CO-CHAIR THOMAS: Okay. Are there any other questions? Qassim?

MEMBER ABDULLAH: Julie, just a quick comment about the Alaska HSRP response. I definitely want to thank Dave. Dave has a lot of passion for Alaska. He started it really way before this strategy came, but we just work with him on modifying it to serve both, you know, as a response to the strategy implementation we requested to.

But Dave, your leadership on that brought us together. Thank you very much.

MEMBER MAUNE: Thank you.

CO-CHAIR THOMAS: Okay. You okay with that? Anyone else have a question or comment? Okay. Ed, I'm going to turn it back over to you.

I think that tomorrow, as a panel, we'll probably approve this, whatever we need to do for this Alaska paper going forward. So why don't I turn it back over to you right now.

MS. MERSFELDER-LEWIS: Hey you guys, this is Lynne and I just wanted to make a clarification as to the alternate DFO just to say we really appreciate Dave Maune's checking in and doing due diligence to make sure that his, what I look at as very much a research paper, was accurate and that he did an amazing job doing that.

And any member can reach out to anybody to make sure your work is accurate and correct and we really appreciate that you did that, Dave.

MEMBER MAUNE: Thank you.

CO-CHAIR THOMAS: I think we all appreciate Dave's input here. It was -- it's a tremendous job and I think it will be a nice paper to submit with our letters of recommendation to Dr. Jacobs, so looking forward to that. Okay, Ed, back to you.

CHAIR SAADE: Thanks. Thanks everyone. Lynne, can we start the public period yet or do we need to wait until 4:45?

MS. MERSFELDER-LEWIS: I think you can start it. I just want to double, triple check that anybody else has other comments to make before we go into public comment period.

Because we're just, we and we have just two minutes maybe because we actually were going to start it at 4:35.

I wanted to let you guys know we have at least eight or nine comments if we don't get all of them today, we'll get through them tomorrow.

If we have additional comments, we can

also do them tomorrow. Christine Burns is showing you the additional comments that came in on this afternoon as you guys were speaking.

The initial comments that we had asked for in advance, up to sometime even this morning are already up on the web. We will update the list on the web as well with these so anybody can see them.

CHAIR SAADE: Okay, Lynne, if we can go ahead and start, I'd recommend we go ahead and start, Lynne.

MS. MERSFELDER-LEWIS: Please do. If you want to turn it over to Shep.

CHAIR SAADE: Okay, Shep. If you want to go ahead and moderate the public commentary please.

RDML SMITH: Great, will do. Thanks, Ed, and thank you to the whole panel. A lot of really great discussion, observations in that last session, and there's going to be a lot of great notes for us to unpack and use to guide us going forward.

I'm very pleased with the level of participation we've had from the public so far for this and the comments just keep pouring in. I thought the way we could do this, we only have half an hour, and I would love to be able to give the floor to everyone. But what I would like to do is quickly summarize some of the comments that we've gotten to date just to catch everybody up. And then we've talked to five or so, a number of the commenters have asked to make a short summary version of their longer comment to us here. And so we will shift to that afterward.

But let me just very quickly, and I'm not going to, this is not comprehensive if I don't talk about your comment, don't feel left out. There's a whole, this will all be part of the public record but just some of the themes, some comments on SOMP and the value of groundtruthing, the questions about the role of HSRP with respect to these strategies.

And maybe I'll just make a quick comment on that one and that the HSRP advises the

NOAA administrator on a wide variety of topics, and NOAA has a role, these programs have a role in these strategies and, therefore, that's the role that the HSRP plays. It's advising the NOAA components of the strategies, but nothing grander than that, there's a whole lot of other organizational structure.

Another comment on how to get the data and this was, you know, really points to the usable and accessible part of the strategy, like in the list of viewers and how you can get at it without being a PhD GIS whiz.

A couple of people commented on the fact that this isn't going to go much of anywhere if it doesn't come with some money eventually.

Another comment that there are, particularly during COVID, we have this opportunity because a lot of vessels are idle, they're underutilized, and that mapping is something that can be done with zero people, and therefore will be the appropriate type of activity to be done during COVID.

A couple of offers of some relevant technology with satellite-derived bathymetry. Cautionary note on making sure that we have the requisite accuracy and resolution to make this truly valuable.

Another comment about the need to better include private industry, academia, and nongovernmental organizations in the planning process, and all the way through both now and in the future.

Had an offer from the US Power Squadrons to use their network to help with shallow water bathymetry.

There's a suggestion that we think about creating different types of contract vehicles to be able to do smaller contracts closer to shore where the logistics are a little bit easier.

We had another cautionary note that we need to be sure that somebody is responsible for this thing because if it's just a big, if it's nobody's, the quote is "If it's everyone's

business, it's no one's business." Somebody needs to kind of own this thing if we want to get it done.

Had a comment, particularly about NOAA's navigation services and how they are so critical to the blue economy and to the national spatial infrastructure, and while this is all great, we need to be sure that we are not distracting ourselves from the core long-term responsibilities that these programs have.

We have a comment about the importance of bathymetry and topography for modeling, an update on some new technology being used in Alaska for water modeling, I'm sorry, water measurements, and et cetera, et cetera. It keeps going on.

So anyway, I think that's a little bit of a flavor of it. I think I would like to shift now to recognizing some of the commenters for brief comments. I think we've got seven, eight, we got up to ten. Well, we've got nine lined up. And so we have about, just a little less than 30

minutes now because I used some of it. So maybe think in terms of something like three minutes.

And so first up is Dr. Joseph Zhang, and maybe you can introduce yourself before you make your comments. Thank you, Dr. Zhang.

Dr. ZHANG: Thank you. Thank you Dr. Smith and thank you, everybody. Can you all hear me okay? Okay. So I am Joseph Zhang. I'm a professor from Virginia Institute of Marine Science. So I've been doing coastal modeling for 20 plus years. So I just want to give my support to the important work that you all are doing. I think there's a general consensus in the modeling community, especially in nearshore modeling community, how important the bathy-topo information is.

And after 20 years, we are still facing some critical large gaps in terms of nearshore bathymetry in particular. So I give an example. Recently we finished a few marsh related disparities, and we were using the best highest resolution information available from

NOAA, from USGS. So, by the way, I think the OCS did a fantastic job in compiling all those kind of high-resolution information.

But we are doing this study in the Chesapeake Bay, and what we found is for the tributaries and subtributaries, some of the bathymetry information is really old, 50 plus years.

So what we did eventually is, and we found that the lots of channels and lots of creeks are broken, and so we had to send our own field crew to resurvey the data. And five years ago when you talk this kind of inaccurate information to surveyors, they will tell you, oh, models, you know, cannot take this kind of high-resolution, high-accuracy data. You know, so even if we gave you, you cannot make full use of that.

But I think that has passed and the modeling technology has really caught up. And I can tell you unequivocally now, you know, we can actually make full use of the high-resolution and

high-accuracy information.

And the way I'm mostly interested in this kind of, from watershed all the way to the oceans, is kind of seamless modeling technology. So what we really need is this kind of seamless bathy-topo information with consistent reference to the vertical datum.

So I think in terms of accuracy, I think it's really very, very important, and we have published a number of papers that demonstrate how sensitive the results, really this body of results with respect to the accuracy of vertical datum. So we came up with estimate of 1 centimeter is really needed. That's if you cannot do this for the entire 0 to 40 meters, I would say from 0 to 10 meters, give us this kind of accuracy; that would be hugely appreciated. Thank you.

RDML SMITH: All right. Thank you very much Dr. Zhang. I appreciate it, and I'm really glad to hear that about the modeling community being ready for the next level of

resolution. Thank you. Our next commenter, a dear old friend and colleague, Guy Noll from Esri.

MR. NOLL: Hi. Hello everyone. Today I'm trying to represent some sectors that I don't necessarily get into all that much. In particular, I really appreciate work that Dave Maune put in on the Alaska Mapping Program outline, and I think it's well on its way to being a very successful program.

There were a couple comments that I wanted to make about that in particular, specifically the work that's already been done with USGS. Esri is part of this for the Ecological Coastal Units and that began a few years ago now, a couple years ago and has a global reach with global partners outside the U.S. as well. That's based on Landsat imagery. And so it's only a resolution of about 30 meters but that would be a good start towards a baseline, if you will.

And then we recently begun work on a

Sentinel-2 vector extraction program using machine learning. And I submitted an image that is here. This is from northeast United States. It's not perfect, and obviously it has picked up some things that shouldn't be picked up and probably left off a couple of things that have been left off. But this is from August, and we're continuing to refine the process. And I think that we will get a very good baseline.

So my point in showing this is actually that although the common problem in the past has been how do you establish a full map of Alaska; it's such a large costal area with challenges in weather and tides, the datum, et cetera.

Now that we have the machine learning computational perspective, I think we should also be thinking about how do you see trends over time, not just that baseline effort but also the changes over time. And then highlight those changes so that people can do something about them, whether that's local stakeholders using

mobile devices or unmanned aerial systems to update certain aspects or perhaps having ports to provide their own information and own that, maybe through the CMTS or the MARAD. They could provide those updates that then become part of a national database, similar to your bathy database, Shep. Thank you.

RDML SMITH: Thank you, Guy. That's very exciting. The machine learn is really another really great example of how machine learning needs to be a critical part of how we design these programs from the beginning. Because as you point out, one of the things we're looking for is change. And if we can do things in an automated way, it's going to make that go much more accurately and smoothly and with wide scope. So thank you, and it's good to see you. Thank you for joining us.

Next up is Helen Brohl from the Committee on the Marine Transportation System. I will also note that Helen is an HSRP veteran herself. So go ahead Helen.

MS. BROHL: Thank you so much, Admiral. Thank you Chairman Saade, Admiral, and members of the HSRP. I really appreciate the opportunity to submit a written statement and just provide a very short overview at this time.

I'm Helen Brohl. I'm the Executive Director of the U.S. Committee on the Marine Transportation System, or CMTS. I'd like to give a shout out to Mr. Noll for even mentioning the CMTS. I appreciate that.

I just want to make note of the fact that the CMTS has certainly monitored the efforts that are going on with NOMEC and with the arctic coastal mapping strategy, and we are certainly very supportive. Many of our member agencies, in particular NOAA, have been very engaged in the development of those. We have certainly been monitoring and appreciate the effort to consider all of our mapping and charting needs within the United States. I'd like to emphasize two points, however.

One is that while the work of the

NOMEC and the arctic group is very complementary to the work of the National Ocean Service, charting and mapping, the co-op work, Geodetic, it is not yet clear how those initiatives will be implemented fully. And to that end, we hope that you'll consider while remembering or emphasizing that the foundational programs that the Marine Transportation System relies upon, again, those from the Office of Coast Survey, co-ops, Geodetic, the NOS programs are hugely important to the Marine Transportation System to navigate safely and securely through our waterways.

I also want to emphasize that the work that is going on with those programs is interagency. Other agencies, including Coast Guard, Army Corps of Engineers, the NGA are engaged in providing real-time navigation services to industry. But in doing so, they're working very collaboratively to try to bring the United States to, dare I say, the 21st century plus in providing the best information, the most discoverable information, and real-time

information, again for navigation services.

So to the extent that as you consider these new initiatives which, of course, are important, we also appreciate that you do not throw the baby out with the bathwater so to speak, and remember that that those foundational programs are also extremely important.

That's it for me. Thank you so much. I'm happy to answer any questions.

RDML SMITH: Okay, thank you, Helen. I appreciate it. I appreciate your comment and thank you for your service to the HSRP.

Okay, next we have another HSRP veteran very recently, Joyce Miller. And I don't know how you use your organizational affiliation these days, Joyce, so I will let you introduce yourself.

MS. MILLER: Hi, I'm Joyce Miller. I'm a retired hydrographer and deep water mapper. And two things, my last meeting in Juneau, thank goodness we got AIS, the PORTS information on AIS. That's a real accomplishment for the HSRP,

I think.

And a comment to Paul, look at the IHO standards as a starting place, at least, rather than don't reinvent any wheels. Those are two sort of sideways comments.

I've been involved in Integrated Ocean and Coastal Mapping since 2002, I attended my first meeting. In that time, ships have gotten multibeams and many of them have sat idle even after the Integrated Ocean and Coastal Mapping Act was passed in 2009.

The comments that Larry and Sean made about funding are really the point of my paper or the comments I made. Ships have really sat idle because there was no funding for deep water mapping. We've got the multibeams, we've got the equipment, we've got a whole new band of surveyors, and in this COVID crisis, many of the academic ships are underutilized or idle. And there's mapping that could be done. If you look at the U.S. bathymetry coverage and gap analysis, there's mapping that could be done within the

range of medical facilities that we could at least get a start on filling the gaps that are near enough to be reachable in this COVID time.

So, again, we've had an integrated ocean and coastal mapping group. They talked about standards. We talked about a national plan. We can plan for another two decades, but if we don't have funding for mapping, and I'm totally in support of greater than 40 meters because it's doable, then we're not going to get anything done. That's my comments, and it's good to see everybody. I am in Hawaii.

RDML SMITH: All right. Thank you, Joyce. I appreciate it. Thanks for your comments. Next up we have Dr. Vicki Ferrini from Lamont-Doherty Earth Observatory who also serves as, I don't know what the right title is, she heads one of the regional data assembly centers for the Seabed 2030 global ocean mapping effort. Go ahead, Vicki.

DR. FERRINI: Thank you. So I'm going to submit a written comment but echoing a lot of

what was stated earlier, I really sit in the NSF-funded space. And echoing what Joyce said, recognizing the huge investment that's been made in the UNOLS suite and its capabilities for mapping as well as data management and data synthesis efforts and also best practices for data acquisition.

Really most of what we're doing, besides the basic data management, but the data curation and the best practices, are very much geared towards the deep water. And so I am very encouraged by the opportunity to work more closely across the silos that exist so that we can share knowledge and approaches.

And then just very briefly in the space of GMRT, the Global Multi-Resolution Topography Synthesis, we've been evolving over the past few years because we recognize that more data is being acquired than we can keep up with, right. So we're presently more than 50% of the UNOLS data, or academic data that has gone into the NOAA archives has been integrated and

processed for GMRT. Most of that data goes in raw. We're trying to make our tools distributable so that people can use them, whether it be academics that are out collecting data or other mapping groups that might be processing data routinely as part of their standard operating procedures.

And what we found in our years of trying to build this global synthesis is that it's really helpful, particularly when you're working with transit data, which is important for filling some of the gaps, to look at the data in the context of other existing already processed data.

And so that's what we are evolving our tools to do so we can distribute it out on ships, to other researchers, even to potentially engage students to engage in this process, which is a kind of citizen science to help us build these data compilations and make them more acceptable to the public.

So I think that's all I have to say.

Thank you for the opportunity.

RDML SMITH: Thank you, Vicki. I really appreciate it. And thank you for all you do for ocean mapping and appreciate you joining us today. Next up we have Molly McCammon. Is Molly --

MS. MCCAMMON: Yes.

RDML SMITH: -- ready and available?

MS. MCCAMMON: Yes. I have my web cam on, but it's not showing up for some reason.

RDML SMITH: Okay.

MS. MCCAMMON: But can you hear me okay?

RDML SMITH: I can.

MS. MCCAMMON: Okay, great. Well, thank you so much. First of all, I just want to thank the committee and Dave for his work on the Alaska mapping strategy. This was an opportunistic effort because when the executive order came out a year ago, the state, NOAA, USGS, and Alaska Ocean Observing System had already been working for the prior year developing a

strategy for developing priorities for coastal mapping, so it is really opportune that the executive order came up.

So we really appreciate Dave's work on it. We appreciate his reaching out to us and asking for input. And also for being very patient for us getting our input at the last minute and incorporating that. So thank you.

I did want to note that, you know, the whole issue of coastal hazards when AOOS first go involved in this was in 2012 when we did a workshop with USGS, Fish and Wildlife Service, the state, numerous landscape conservation cooperatives that Fish and Wildlife Service was doing and trying to see what the whole play was.

And there are lots of different components with coastal hazards. There's the sea ice component, there's the bathymetry and charting, there's water level, there's permafrost, there's some coastal mapping, there's vertical data, so there's all these pieces and how do we all kind of play together and what is

our various niches in there. And that's when AOOS really kicked off the water level observations as kind of our piece of it.

And since that time, with support from the National Weather Service Alaska Regional office, we've devoted quite a bit of funding and time in highlighting the GNSS reflectometry stations. And we have one active one in St. Michael now it's the UNAVCO site. We have one going into Utqiagvik, and we have another, but it was delayed. It was supposed to go in this summer but was delayed due to COVID travel restrictions. And now we have another one that will go in somewhere on the west coast of Alaska as well. So we will have three GNSS sites that are AOOS supported.

And I just wanted to note the reason the Weather Service came to us was because we were able to pool money from multiple sources over multiple fiscal years. And so I just want to emphasize that the IOOS Regional Associations can really be looked at for a testbed for these

kinds of opportunities in the future.

And again, I want to thank the committee and Dave for his work on the mapping strategy.

RDML SMITH: All right. Thank you very much, Molly. I appreciate you and appreciate your comments and joining us. Next up, we have Dr. Bob McConnaughey from Alaska Fisheries Science Center. Hi, Bob.

DR. MCCONNAUGHEY: Hi. Good afternoon everybody. Let me mention that I'm a fisheries biologist with NMFS, and my particular specialty is habitat science.

So some of the earlier discussion today addressed regional prioritization challenge. I guess, with my question, I'd like to try and take the conversation into thinking maybe one level higher.

So recently, I had the good fortune to lead the NMFS team for Alaska, where we were identifying and prioritizing areas for mapping under NOMEC. And to do this, we surveyed all of

our scientists and managers at the Science Center in the regional office and compiled that information. And as you can imagine, we wound up, the result was a pretty complicated mix of requirements and justifications. And that's, if you will, just for Alaska fisheries.

So my question then is, is that presidential memorandum identifies multiple societal needs: things like security, minerals, navigation, and everybody's favorite, fisheries, and some others probably, and all this from a national perspective. So I'm wondering how these different needs, meaning not so much regions and sites but higher-level needs, how they will be or can be prioritize and translated into an operational sequence. In other words, I mean, how do we consider the relative importance of security, minerals, navigation, fish, and others. Thank you.

RDML SMITH: All right. Thank you very much, Bob. Appreciate your comments. Thank you for joining us. Next up we have Denis Hains.

Is that all right? Did I get that right?

MR. HAINS: Yes.

RDML SMITH: Denis Hains, the former head of the Canadian Hydrographic Service and now on his own. Denis, I appreciate you joining us today and for your comments on the site as well and appreciate your willingness to make a public comment. Go ahead, please.

MR. HAINS: Yes, it's going to be pretty short. You can read my comments here, so I just want to thank NOAA for this very transparent process and open allowing for input.

So my comments are more really to the framing that you mentioned in your presentation that there are two oceans and the Great Lakes were included, but as a Northerner coming from Canada, I think the Great Lakes should be spelled out and also three oceans rather than two ocean to include, of course, the Arctic Ocean, which is a challenging one as you all know.

Second element of what I wanted to provide as a kind of overarching concept and

scoping is the multinational impacts of NOMEC. Clearly, most of the work is going to be done in U.S. territorial waters, and that's great, but I think it is essential to name the collaboration that will take place because I'm assuming it's going to take place with neighboring countries such as, of course, Canada, Mexico, Russia, the Caribbean countries, I'm assuming, and all others.

I think it is important that this is framed into your documentation either under the governance piece that you mentioned under Goal 1.1 or possibly under the Goal 5 that you mentioned as well in terms of going beyond the partnership of the basic.

But that's all I wanted to mention this afternoon. Thank you.

RDML SMITH: Well, thank you, Denis. Appreciate your comment and glad you were able to join us and certainly take your words of wisdom to heart. Thank you.

And last on our planned list is Eric

Fischer from Geoscience Solutions. Eric, are you on?

MR. FISCHER: Can you hear me?

RDML SMITH: Yes, we got you.

MR. FISCHER: Okay. I submitted a couple of questions. I wasn't sure which one we were looking at on the sheets.

RDML SMITH: Well, really, you can make whatever comment you'd like. We really don't have a lot of time to respond to them right now, but whatever you'd like to use your time for. Thank you.

MR. FISCHER: Okay, thanks. So just looking at the broader picture, there's a lot of BOEM activity permitted going on on the east coast right now as well as historic activity in the Gulf of Mexico. I wasn't sure if you guys were looking at integrating with that data to make the requirement for BOEM data to be submitted to this mapping plan. I think there would be a lot of value in that. The requirements there are pretty high where we're

required to do (audio interference) as well as with the infrastructure going in place (audio interference) are you working with those operators to install different CO-OPS or CORS stations on those structures to provide a network for positioning offshore reference? There used to be several of these in the Gulf of Mexico, and I've used them years ago, and they were really nice as far as a lot of impact that can happen there.

And my last question was around National Marine Fisheries permitting. Is there any discussion around permitting requirements and how that might affect opportunistic surveys? Thanks.

RDML SMITH: Yes, we could talk for hours on those questions, but really great, I particularly appreciate you raising the subject of the BOEM data and the environmental compliance requirements because those are two big issues that we have been talking about in interagency discussions, and I am glad that they are on the

record here, and I appreciate you raising them. And thank you for joining us.

So that is all the speakers we have lined up for the public comment period today. We will have another public comment period tomorrow. Appreciate everybody's really great, concise comments, and I look forward to doing some more of this tomorrow. So keep sending in written comments, and we can work with you from there if you think that it would be helpful to make a public comment as well.

And so with that I'll turn the chair, turn the floor back over to our chairman, Ed Saade. Take it away, Ed.

CHAIR SAADE: There we go. Okay. All right, thanks. That was a great session. Fantastic that there's so many participants both with the panel and certainly with the guests and the public. That's what it's all about.

So we're going to get into the wrap-up mode here. I'm going to step through the panel and request some wrap-up ideas and comments.

We've got the better part of a half an hour here. It's going to be everybody that has had a chance to speak today formally and anything you want to do to wrap up, and again, we have more time tomorrow too if we don't cover everything. So Gary Thompson, let's start with you.

MEMBER THOMPSON: All right. So I'm always waiting because I'm a T to be the end, so --

CHAIR SAADE: I know. You can thank Lynne for flipping the order there.

MEMBER THOMPSON: That's all right. So great session today. A lot of brilliant, great information. I want to thank Dave for your leadership on the paper. You've done a great job, and I was glad I could participate.

But I think we just need to keep looking to use existing technology but also new technology that can help us map in these environments that are critical to the infrastructure, critical to Alaska, any part of the country. So I'm always looking forward and

always like to use new technology when I can when it's proven technology.

CHAIR SAADE: Okay, thanks. Julie Thomas. You're muted. Julie, you're muted.

CO-CHAIR THOMAS: Got it. Can you hear me now? Maybe I can just say ditto on what Gary said. I agree totally, and I'm also continually amazed during the director's reports about how much was -- or how much people have been able to do during COVID and these challenging times.

And maybe I'll just make one more comment to the panel because tomorrow we're going to be talking about the letter to the administrator, Dr. Jacobs, and Sean's going to be leading that discussion. But just a reminder that if you have any suggestions, we will be wanting suggestions as far as what to include in there, particularly topics that have really struck a chord with you or something of interest. So, you know, if you could just jot down things that you want to make sure we include in that

letter, that would be great. Okay. I think that's it for me.

CHAIR SAADE: Thanks, Julie. Captain Sal.

MEMBER RASSELLO: Hey, can you hear me?

CHAIR SAADE: Yes.

MEMBER RASSELLO: Okay, yes. I think it's great work today. It is very late over here. So I'm going to say that for these two projects, prioritization and the coordination is of paramount importance due to the environment we are in with this COVID. So that will dictate our step forward, although I am very optimistic on what strategies we are taking and looking forward to continuing working with you guys.

CHAIR SAADE: Great. Thanks a lot, Sal. Ed Page.

MEMBER PAGE: Yes. I'm particularly encouraged by the use of AIS to disseminate PORTS information. That was an issue that was a logjam for some time. And then at our meeting two years

ago we were in Juneau, that's when the head of Waterways Management for the Coast Guard headquarters, Admiral Gallaudet, kind of hammered out this and agreed they needed to move forward on applying the Coast Guard goals to support NOAA's dissemination information, so I think that's encouraging. And it starts with the ports but even if you notice some areas or your Coast Pilot have information, any information or even precision navigation information that can be better sent via, you know, AIS digitally versus voice, is a positive sign, more clarity and better access.

So other weather information has been a great way of applying the AIS transmission of data. I see that when I go to Canada. I see a lot of AIS sites transmitting information to vessels. I see it overseas. We were a little slow on the uptake on that one, so I'm glad we are finally moving on it. And, of course, the Coast Guard owns the infrastructure but NOAA had to be able to convince them that's the best

interest to make that available and start using it to pull an application of other parts of the world.

So that's a good step forward, and I'm pleased to see that. Everything else, of course, to chart in. I can't say much more about how much effort has been put towards Alaska. I got to be quiet now. I don't want to monopolize everything, so I'll be quiet. Thank you.

CHAIR SAADE: I mean, you're a congressmen. Okay. Captain Anne McIntyre.

MEMBER MCINTYRE: I think I'm unmuted.

CHAIR SAADE: Yes, you're good.

MEMBER MCINTYRE: Great. Okay. Yes, I just wanted to just kind of touch on something that Admiral Smith said earlier today when he had the slide up with all the little autonomous vessels out there. And it was that he said three years ago I wouldn't have felt comfortable moving forward with the technology, but today I do. And it was just in general a comment about how exponentially technology is growing and

impacting, you know, everything under the purview of what we advise on. And I just wanted to comment on that. It just really struck me and, again in the time of COVID when we are all having to make these big technological shifts just to do our job, it's amazing to me how quickly things are changing, and also just how much opportunity is put forth along those same lines.

CHAIR SAADE: Thanks, Anne. Dave Maune.

MEMBER MAUNE: Yes, I have three topics. First of all, several people mentioned things dealing with the environmental factors, fisheries, that sort of thing. We are in the middle of the 3D Nation Elevation Requirements and Benefits study, and Ashley Chappell is heading it up from those perspective, and it will be interesting to see what the results of that have to say about the benefits of elevation data for satisfying over a thousand different mission-critical activities.

The second point I wanted to raise is

Admiral Smith talked about these emerging technologies, and I will be anxious to hear everything I can about the lessons being learned from the ongoing Saildrone project in Arctic Alaska. I know you're working there hard last year and this year, I believe, and I will be anxious to see how well that works out because that Saildrone goes out for weeks at a time by itself. It's just operated from Mission Control. And so I'm pleased to learn more, I will be pleased to learn more about what its capabilities and limitations are. That's all I have. Thank you.

CHAIR SAADE: Thanks, Dave. Captain Ann Kinner.

MEMBER KINNER: Yeah. A couple of quick comments. I think it was something in Juliana Blackwell's comments about, the comment was made about doing things right as opposed to doing things quickly. And it struck a chord with me because I've said for years, you cannot have a deadline on a boat. The minute you do, you have

a problem. So it needs to be done right, and if it takes longer to do that, so be it.

I will be looking forward to tomorrow to talking about NOMEC, particularly about interactions with other agencies, and there was a certain amount of that in the Alaska paper as well. But I know there are a lot of people out there looking at the bottom of the ocean. And it's going to be interesting to find out how many of them are talking to each other and how we can share that information and maybe get through the deep water part with less expense so then we have money to spend on the shallow water part. That's it.

CHAIR SAADE: Thank you. Ed Kelly.

MEMBER KELLY: Yeah. I continue to be amazed over the eight-year period and especially even at an accelerating rate of calculus here how quickly the technology is becoming frequent, more available and more people are working out there. I, again, go back to the maxim: measure it once, use it a thousand times.

And just in this public comment, we have more opportunities to hear private enterprise coming up with what appear to be quality data acquisition and use systems that we have to find ways to have NOAA and other governmental agencies work to assimilate and accumulate and to integrate and use that data so that the pace of our exploration for mapping, safety, et cetera can keep pace with the rate of technology that's emerging here.

The only thing I am disappointed with is that by now I thought Rich Edwing would've had a much better COVID beard, and I'm a little bit disappointed in that, but other than that, this is a good meeting.

CHAIR SAADE: Thanks a lot, Ed. Lindsay Gee. You might be muted, Lindsay.

MEMBER GEE: Yeah, I'm muted. Sorry. I'm hopefully there now. You know, and again, I said before that I think we're seeing, as Ed said, we're seeing an ocean moment, and I really, it's exciting to see that. I echo again about

this being discussed by a number about the benefits of public-private partnerships, and I think Ed just described how there's so much happening in the private areas and nongovernment areas with technology particularly that we need to be able to make sure that that's fully utilized and it's efficiently utilized in any partnerships we move forward.

I think in the technology point of view, it's great. As you know, I kind of like to see the technology applied and all those things, and hopefully we will talk more about that tomorrow on the NOMEC discussions.

I think we're seeing a trigger in some of these things too. We hope they come forward from, kind of that initial thought of there's some use of the technology, but maybe the COVID situation is going to be a bit of a trigger for this, and I think we're seeing that a little bit.

From a personal experience right now, you know, we've had Bob Ballard talk about

telepresence in the '80s. We didn't have the technology to allow us to do that. And it was, kind of, we did it with people ashore when we kind of could, but right now we are being forced to do it.

And, you know, cruises are using that fully. And so hopefully, that trigger of COVID has some benefit in that it allows other technologies to be really used more when people are just be thinking they might use them, now they can truly embrace them and move forward. Thank you.

CHAIR SAADE: Thanks, Lindsay. Dr. Nicole Elko.

MEMBER ELKO: Thank you. Thanks all the organizers today. This has been a great session. I feel like everyone was really engaged, and I really appreciated the conversations.

I'm looking forward to the conversations tomorrow about NOMEC because for a number of reasons that have already been brought

up, specifically interagency coordination and kind of this concept of integrating the rapidly emerging new technologies into the mapping strategies, right.

And we've said that a number of times now, but how do we do it, right? This isn't something NOAA has necessarily embraced fully in the past, and it seems to me that, you know, starting, it seems to me that we're going about it the right way, right? Developing the protocols and standards first is key because that kind of sets the bar of, you know, how deep in the new technology or low-cost sensors or citizen science or wherever we're going, we can go.

But, you know, so I think that's the million dollar question and it's developing the protocols and striking that balance in your data standards and kind of that, like, new technology sensor cost advantage to be more efficient.

So, again, just looking forward to talking about that tomorrow. I hope we can find a way to recommend some of those in the plan

because if we don't, by the time it comes out, we might be addressing, you know, yesterday's needs today. I'd like for us to avoid that. Thank you.

CHAIR SAADE: Thank you. Sean Duffy.

MEMBER DUFFY: Yes, thank you Mr. Chairman. So as Julie referenced, tomorrow I will be working to try to capture ideas for the response letter, and I will use that as kind of a segue into something that I will, I've mentioned before on some of the subcommittees but what I would call making sense of sensors, where we have some different readings in some of the sensors, and I'm sure it happens in other places. And it was really good to hear Dr. LeBoeuf, and she had a great point about having a presidential directive.

And, you know, something we say a lot is, never waste a good emergency, so while we have the attention at that level pushing the efforts to deliver not only just papers and continue on all the NOMEC and the different white

papers but that we have a lot going within this group and hopefully I can take comments tomorrow and at least start a draft for the response letter. And with that, I will sign off. Thank you.

CHAIR SAADE: Thanks, Sean. Captain Anuj Chopra.

MEMBER CHOPRA: Hi. Good afternoon. Thank you, Ed. First, I know I mentioned it earlier, again I'm really amazed at the amount that's been achieved by the NOAA leadership in these COVID times. I'm excited about the public-private partnership and the way that's moving as has been proposed.

Appreciate the leveraging of technology as already mentioned by everybody else. I think this is the age of AI, and we use it and to our best advantage. Looking forward to tomorrow. Excited for tomorrow and looking forward to getting to some good conclusions by the close of business tomorrow. So thank you. Thank you for this opportunity.

CHAIR SAADE: And Dr. Qassim Abdullah.

MEMBER ABDULLAH: Thank you very much, Ed. And it was a great meeting, absolutely. And I echo what Anuj said about the progress of NOAA and other federal agency achieved during this difficult time. Keep it up guys, great. We are proud of you definitely.

I just would like to emphasize on NOAA the interagency working group, I think it is a great idea. But I just want to see more tangible cooperation because from experience, I think different agency collecting coastline data with different specification, and I thought when they sit around the table in this interagency this should be hashed down so they agree what to collect, so just an observation. I could be wrong about it. But I think it's a great opportunity for all these federal agency to comment but to support what has been talked about.

As for private academia partnership, to please have a seat for them on the table. You

know, because giving them five minutes for lightning talk at the public comment is really, historically public comment doesn't change cooked policies, let me tell you that. I mean, very little, if it does anything to change anything because things are already, you know, on the paper. People are excited about what they put. To have somebody comment and change that, it is very difficult, the human being nature, you know. So if you really want participation, and we have a lot of intelligence in the academia and the private, there is so much capability that can serve the NOAA and other federal agency, just give them a seat on the table to contribute.

And lastly, I just want to emphasize wish that we can after this meeting, we take a serious step on what I proposed before to Paul and maybe Ashley on the depth element of national standards. I'm not talking about practical. I'm not talking about the project specification. I'm talking about national standard for coastal mapping and hydrographic surveying. And I would

love to entertain that idea and give idea or participate in the development.

Dave was with me. We developed the National Center of Mapping for ASPRS. It is worldwide used, worldwide now. We can do the same thing. We can lend our experience to NOAA and the interagency of the coastal mapping. Thank you very much.

CHAIR SAADE: Thanks, Qassim. Okay. We're going to shift over to the directors and leadership. Let's start off with Dr. Larry Mayer.

DR. MAYER: Well, thank you. I guess I'm going to start by piling on with comments on how much has been accomplished by the officers. It really is amazing in this time to see what they've done, and it's really encouraging.

I will focus my comments on the NOMEC, and hopefully we will be able to come back to it tomorrow. I've certainly paid a lot of attention to it. It is near and dear to my heart, and I don't use the word great a lot I suspect. I think it represents a really great challenge.

But like great challenges, it also offers great opportunities, and I think NOAA has made a really great start in addressing it. And it is a start that has been filled with lots of, I'll say great intentions, just keep using the word great. But it's a huge task, and it really is going to take all hands on deck to get it done.

And I know technology is going to come to our aid and hopefully we're in the midst of that at the university in trying to push those technologies. But my biggest fear is that unless we find the mechanism, it's really an issue of finding a mechanism that will truly allow the engagement, collaboration, and cooperation of all the sectors we've talked about: private industry, philanthropy, academia, federal agencies, state, and local people. It's going to take everybody to get the job done.

Unless we find that mechanism, we can let a great opportunity slip through our hands. We may see a great opportunity slip through our hands, and so I'm hoping tomorrow we can come

back and maybe have some time to start brainstorming about are there mechanisms out there that can really coordinate across all those different sectors. That's it. Thank you.

CHAIR SAADE: Thanks, Larry. Rich Edwing. You're muted, Rich.

MR. EDWING: There we go. I have to push two buttons. That's very hard, you know. So anyway, as I said, a very good meeting. I appreciate the, you know, recognition we've gotten from the panel members for the great work, you know, not just my office but co-serving and just being able to get done this year despite the pandemic.

You know, my office is not as centrally involved in the NOMEC and Alaska strategies really, just very peripherally to NOMEC, but certainly we do have some role up in Alaska. As Shep mentioned, there are places that really don't have, you know, tidal datums. We can't use VDatum, so we've been really involved with the Alaska Water Level Watch and other

groups that are looking to, you know, be able to get more work done up there with water levels. So just stay tuned, I guess.

And for Ed Kelly, Ed, I actually couldn't get back this morning because, you know, I do work for the government. I didn't want to look too shaggy. You know, I could have gone for a General James Longstreet kind of look there but, so, thanks, Ed. All right. Thank you.

CHAIR SAADE: Great. Thank you. Juliana, you're up next.

MS. BLACKWELL: Okay. I'd like to thank the panel members for their continued engagement on these topics between the meetings. I think you all owe yourselves a pat on the back and a round of applause from us here at NOAA for all the work that you've been doing in between. And so all the working groups that have been meeting and discussing these topics and coming up with recommendations, it's because of the work that you've put into it, and we really appreciate you taking this seriously and providing your

professional input to the work that we're doing and the challenges that we all face together.

I think that you should also be, as part of that, proud of yourselves for putting together the white paper on the Alaska Coastal Mapping Strategy and getting out in front of the development of the implementation plan. And I realize that that might not be all the industry input that you would like to see, but I believe you are representing your sectors well and your areas of expertise in providing the input through that white paper. So I thank you for your engagement. Thanks.

CHAIR SAADE: Thanks, Juliana. Captain Andy Armstrong?

CAPT. ARMSTRONG: Yeah, I managed to get those two buttons pushed, Ed. So I think most everything has been said. I'd like to add a comment recognizing the really good public input we had. I think there was some really helpful statements from the public commenters this time, and I hope we will have a chance to follow-up on

some of those.

And also I want to thank Ed and Julie for doing such a great job of leading us through the meeting today.

CHAIR SAADE: Thank you, Andy. Nicole.

MS. LEBOEUF: Thank you, Ed. Thank you, everyone. I've said this before, and I will say it again. I've worked for a lot of federal advisory committees over my 25-year career. The HSRP is the gold standard. You all are engaged, expert in what you do, and willing to share your feedback with us in so many ways, so thank you for that.

I also would be remiss by not mentioning this, it's end of the year performance evaluation for Shep and Rich and Juliana. So they appreciate all of the compliments.

I would pile on further but because I'm at the head of NOAA, I feel like I'm gloating at this point. I'm so proud and so impressed with the team. We've been in touch all year, and I know how hard it has been for all of them to,

not just get through COVID and do their mission, but transform their mission in so many ways to be as productive as they have been. It has just been really kind of a big awful glass of lemonade, but we will take it and thank you for your praise on that.

I can pile on on the technology stuff, but it's not just technology and Dr. Jacobs might reiterate some of this. It is the incorporation of technology, but it is being also nimble in our data assimilation and processing and providing access to others to do the same so that we can really be keeping pace with the coastal change that is accelerating and we know this. So really look forward to going into this era with all of you and appreciate your engagement immensely. And hopefully we will get a few takers for the wrap-up in just a little while. Thank you, Ed.

CHAIR SAADE: Thanks, Nicole. Dr. Jacobs.

DR. JACOBS: Yes, I just wanted to say I appreciate the chance to speak earlier. Lots

of good discussion on new technology with UxS and other sampling. I really want to emphasize there was some discussion on the quality control and the metadata. I think as we go forward and we have more different type of observing systems that this is going to be the more critical as well as data management.

Great points on the interagency coordination. I think that streamlining that process and trying to reduce any redundancy while we're doing it is going to be really, really helpful and, of course, the ties back to coastal resilience and fisheries and any other aspects that we can utilize a lot of this stuff across the agency, I think there's a lot of additional value there that we haven't even dug into yet.

But lots of good questions from the community. Great to see the feedback and support for data acquisition for nearshore modeling. And, in general, just really, really appreciate everyone's understanding of all the challenges we've had this year with COVID. I just can't say

enough how proud I am of the agency for everything that they've been able to pull off this year and how everyone has been able to adapt to the new way of doing things. So kudos to my own team there. I'm proud of you.

CHAIR SAADE: Great stuff. Thanks, Dr. Jacobs. In the interest of time, I'm going to hold my comments until tomorrow, I think, because there are so many good points to make. Rear Admiral Smith, would you like to wrap up for us?

RDML SMITH: Yes, I would, very briefly. Ditto to, you know, all the thank yous that have been made so far. And two more, one is that, you know, I really think the inspiration is contagious here, and that, you know, the dedication of the panel has inspired the programs to engage more and to raise the sort of level of this review and there's something really important.

NOAA leadership has both seen that inspiration and also provide their own inspirations that helps us keep going. And I

think the public today, we saw a level of public engagement with this panel that we have not seen as much in the past either. And that, you know, all four of those parties really are inspiring each other, and I can't wait to take that same level of inspiration and apply it to some of the really big challenges that we have coming up, including NOMEC implementation, Alaska coastal mapping strategy, et cetera.

And then the only other thing was just a huge shout out to the folks behind the scenes. I don't know whether any of you have ever been involved in theater before but the showrunners, you know, they have a separate radio system that's like this whole other drama that's happening that's not on the stage. And so I've had one ear to the chat that's going that's keeping the run-of-show running smoothly and those folks, all the folks I mentioned earlier, have really been really executing in a brilliant way for us today, and it makes it all look pretty smooth. And so thank you to all of them.

CHAIR SAADE: I second that, Shep. And so it's really great to be able to have all that support in the background keeping it all running smoothly, you know. Great job by everyone. So just --

MS. MERSFELDER-LEWIS: Could you mention tomorrow's start time and that we would love more comments.

CHAIR SAADE: Okay. The start time tomorrow is right at 1 o'clock. We won't have that 15 minute ramp-up, correct? So we will get started at one and I'll just wrap up.

As most of you know, I'm always a big advocate of the fact that great things get invented in NOAA and working with the government on these different parts of NOAA, and I can tell you that autonomous vehicles, both acoustic mapping devices like the USVs that we're looking at, and now even airborne hydrographic lidars, we've, all that technology is getting transferred to the private sector, particularly on the east coast of the U.S.

And it's all of these types of things that get invented and grow and nurtured and challenged by the likes of the people on this panel and NOAA itself, and University of New Hampshire. It's incredible to me to watch that transfer of technology that moves to the private sector and into industry. So if there ever was an example of public-private partnerships, it's the ability to move these ideas from the public, from the government sector, and the things that we do here and that we talk about here, and then being embraced and going out and really making a huge impact on the world.

The other aspect of it all is, you know, we're talking about NOMEC and Alaska. My two favorite things to do, mapping in the ocean and working in Alaska. So I couldn't be happier. With that, I think I will wrap it up and call it a day and thank everybody. And today's meeting is officially over.

(Whereupon, the above-entitled matter went off the record at 5:38 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: 09-23-20

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