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TRANSCRIPT:
[Captioner Standing By]
>> Good morning everybody, I feel like we are so fortunate to have the Admiral in this morning, starting out with that little discussion. I think this morning, we are going to just jump in, we will do a round robin again. Let's just do our normal good morning or whatever you want to say, any thoughts overnight? Any thoughts overnight about yesterday's meeting. Isn't that what you're going to say? Yes.
And, and we have a couple of great sessions this morning, and as you know this afternoon we have field trips. So, we are going to start off with Mary page. And I now have learned the first name is Mary page. Thank you so much for this. Thank you Mary pay for starting as of, you are lucky because you walked in with the abbot as far as the first letter of the alphabet.
>> Good morning, yesterday was impressive. For me as a first timer. A tremendous amount of information shared. Digested, and I shall continue to do so, I am looking forward to today.
>> Thank you,
>> You are on call some.
We are talking about a thoughts of yesterday or any thoughts overnight or for the thoughts that you have. Round robin good morning session.
>> Yeah, no, sorry so [Indiscernible] looking at the efforts for the area the enter agency Corporation. Direct reports definitely, which everybody brought. The NGS, and modernization of data him.
It is a great definitely. I am still a big believer of the new platform of digital, it can combine a lot of tran one activity. To present it in a friendly manner for user and for policy code with in NOAA and other agencies. To administer it efficiently use the data NOAA Provides.
>> Thank you good morning a lot of great information yesterday, I really late the NOAA leadership view on taking a longer-term strategic perspective beyond short-term. They are looking for long-term games -- make gains in that space, I put a few things which was really nice trying to use data as a service, going out and making the dollars run as long as possible, simile

software as a service looking at those ten year maintenance cycles into the future and trying to allow for that. I thought three-point brought out by Lindsay, when you said 12 kilohertz is much more efficient we will get that going if from 160 days it can reduce it to 50 days your same vessel is doing much more productive and seismic work in that space. The inability within that space so, I think what Admiral Everett said.
Look at sustainability but see what productivity you are getting out of it. So if you are doing simultaneous misses, your carbon footprint permission per day, is much lower than otherwise. So I think those are great ways to optimize, as we call it, and would still like to explore the opportunity for pacification measurements. Coming into that space.
Because there is a strong belief in the industry, that there is a next language that is going to drop. And we can put our arms around that. If we start to get data on that, it would be wonderful. I look forward to today, and learning day thank you.
>> Thank you, Alex?
>> 'S good morning, I hope everybody had a good time last night. It was a good time. A lot of information had gone through. We had our allies set up for it. It looks like we will talk about carbon footprints for a long time. It will be in future meetings, and I am looking forward to today thanks.
>> Thank you balance, and, yes, I think everyone did have a good time. Shawn.
>> Yes good morning Sean Duffy big River coalition. Did have a good time appreciate everything yesterday. One of the things that I thought about last night was in Larry's presentation, that is work that is very critical to the Mississippi River.
Looking at the mind are from the bridge is working on Bridge Heights even the display within the board system. Some improvements were done. Over the last year, on air gap sensors that we have. We still have challenges with the non- federal sponsor in this case. Louisiana Department of Transportation development on installing new air gap sensors. Getting funding for additional sensors. I think if there was more time, it would have been able to speak to Larry and ask more questions. I will work with Larry to catch up more on that. It was very interesting and I am looking forward to today thank you.
>> Thank you Shawn. Nicole?
>> Good morning Nicole Elko, American sure in beach preservation. Yesterday was a fantastic day. Thank you to all of the organizers. Thank you for dinner last night, the sessions also, we were very encouraged to hear all of the input from all of our panelists. About the needs for Puerto Rico communities. And I hope that we can continue that thread and both are navigation and coastal resilience conversations. So we can come out of here with excellent recommendations to help to have the territory. Thank you.
>> Great, do we have remote people on this morning? Any of the panel members? While they are looking at that was go to to love.
>> Good morning, thank you everyone, clearly a lot to digest. But, I was impressed yesterday, I was one of the first people in our round robin right? So as you all kept talking, I was impressed by how there are some themes that are really emerging from these conversations.
That co- developing solutions with communities, carbon footprints, sort of what is the next thing in the future. It feels like another day and a half, and we might converge on things. That we can really put forward his recommendations. Thank you.
>> Great, thanks to Buck.

>> Thanks Julie, first of all I want to say thanks to Admiral Evans in the panel for the discussion yesterday on the big picture sustainability. It was great to see all of the momentum and all in the deep dive that we were able to do. During one of our off-line discussions, we learned the term climate ready nation.
As it pertains to tran seven, and I would like to say I fully support this term. And it would be a big advocate it is a good driving term on the focus for NOAA. It was really informative and beneficial and approves how informative it is to get out to all of these regions will be canceled thank you.
>> Lindsay let's go back to you.
>> Thanks also it was a great day yesterday and like to thank the organizers particularly Alex for last night. Just coming on things additional from what I commented on yesterday afternoon. One I reflected on last night is again the importance of the small port. It kind of reminded me of Hawaii which is a little bit different. It's the equity on how you prioritize and what gets done of them. You may not be a major port as far as trafficking cargo. That probably has more important to local communities and how we prioritize those, and I think is important to address that above different things, but I think that is a real important way to do that. I was really impressed as I said to the directors. It was a really positive, I really enjoyed that yesterday, it kinda brought a number things together for me. In a way that we have not talked much about directly this time what was presented, was the foundation in things that are required to support navigation. You are providing the service for that. Seeing what Larry and John mentioned, what Larry did. He did that 20 years ago. But you cannot do it without data, you can do it the right datum's, or the services or the way the data gets provided to everybody.
Because in the end, you are not looking at a webpage it is a pilot out that that has to have a unit, and how is that directly not looking in multiple places and how does he get that situational awareness? If you are going to be navigating, not only to the critical limit. Not with the vessel was ball where it is going, but it is like okay how does it all come together? I think as they mentioned about digital twin. This is what we are really talking about. Maybe there is a pilot and maybe it is related to precise navigation, to bring all of those things together they are all critical it was great to see that. Yesterday.
>> Thank you Lindsay. Gary?
>> Go more Gary Thompson North Carolina emergency management. I want to thank you for the dinner lysate it was great. Lot of information yesterday. During the dinner last night we were talking about the resolution I brought up yesterday. About the Odyssey crisis. I would like to expand that to maybe we could discuss develop an issue paper on the Odyssey with the whole geospatial workforce development. I would like to put that out there to discuss that thanks.
>> Okay we will make note of that particularly for the discussion tomorrow afternoon when we get into issue papers. Nathan?
>> Yes Nathan Wardwell, managing partner JOA survey. I don't have all like to have. Everybody is covered in. But I think what I really enjoyed over the past several meetings as you know coming from Alaska and seeing the similarities in different regions, in the Pacific and now being in Puerto Rico this different challenges in every region. But they're also very similar issues and challenging issues that need to be addressed and seeing that. It is been very beneficial for me.
>> Great thank you Nathan. We are actually other any other panel members online remover this morning? No, okay Admiral let's go to you and expect

>> Thanks Julie, I don't, what Nathan, what most of everything that I would point out has been noted. I really am looking forward to this morning's panel again, for helping us put our nation wide challenges into the local context. Really understanding how they are present here in Puerto Rico and the Caribbean, and how we can extend that, how we see that locally, but also these national challenges. I very much appreciated all of the panel members engagement with Admiral Han this morning, I got that that was good and useful conversation.
She certainly brings more knowledge and authority on these topics that I often get asked.
So thank you for engaging with her. And lastly I will note, I need to step out for a half an hour-40 minutes this morning at 9:00 o'clock. I think Ashley knows that she will sit in for me as DFO during the first part of morning session I will be back
>> Great thanks Admiral. Let's go to Andy.
>> Thank you I guess I just had a thought dinner last night was full, thank you for arranging. And agree with what everyone else is about content yesterday.
>> Larry?
>> The only thing I was going to say is it was a wonderful day cap by an even more wonderful evening. I will, touch on what Lindsay brought up and go back to something that was said yesterday. You know this stuff we are showing, as I said, we were thinking about this for years. The point I was trying to make was how we are really didn't to the point to become a reality. And that, and as I listen to the directors report, you said you have a four year timeframe, I have a 12 year end a 20 year timeframe sitting at these meetings, it is really palpable that the progress that is being made. Also, it is probably more upbeat than I have heard in years, in terms of progress being made in the offices. And the forward-looking aspects of it. I am really thrilled about that. We are going to see great progress. So I thank you.
>> Thanks Larry is Julie and on? No, okay. We can go to Mike.
>> Can you hear me?
>> We can hear you?
>> All right I am missing it down there I can tell. Thank you Julia, I think just an overwhelming applause for the diversity of discussion yesterday recapitalization and aircraft normalization, but what the big take away was for me is priority from the partners, especially from the maritime community and costar perspective, that was pretty telling of the challenges in the operations that they have to do down there. And how we can support them.
Especially the discussion on emergency response. I came away from learning from that but, again a lot of good things that were said. [Indiscernible] thank you.
>> Thanks Mike, Marion? Where is Marion? Back to you.
>> Right here thank you so much I had a fantastic day yesterday and a great evening I am still mystified why my wine glass is always at the same level? So thank you that was delightful. I am really, leaning towards more automation of our work. Just because the demand signal is so strong and we only have the budget and the people that we have.
I hope that messages coming across, I was not really prepared to speak to the meeting with our use of AI. I am very interested to explore that further. Just because of the amount of demand signal for our products and services is so strong. We just have to come up with those ways to work smarter with people that we have. So I really welcome for the conversation about that, thank you so much.
>> All right, thank you, I believe I have everybody. Okay, I think for the record, I need to say I am Julie Thomas Scripps institution of oceanography, welcome to the second day of hydrographic

services reading maps. I will make one comment when you thinking of about out of the box about mapping I think it would be really interesting as you develop the technique of remote sensing and getting any mapping imagery on the bottom. It is a big ocean, and there are definitely times when a vessel isn't available either poster pre-storm, or the weather is bad or shallow water, so I think that is actually an interesting thought that you put out there.
We should not just kind of say it is all or nothing right. There are a lot of times and something like that could be really useful I believe. So.
>> Thank you Julie we were talking about this when the meeting was over yesterday. One of the place to apply this is hard to get accurate. One need a place we try to apply something like this is navigational inlets one that is trenched. Because if you think about it, we know right, when the Channel issue shoaling it is not doing so at a steady rate.
Chances are the first big storm feels it in, and it seems like that for a wild. When it be cool to be able to sort of in real time every day, see this Channel slowly fall in and troll? So whatever accuracy that we don't have in terms of you know, depth accuracy, we are getting from accuracy in the sense that we are looking at the time evolution of something right now. That would be really cool right? So it is things like that that I am imagining, and the method becomes much more accurate by the way, if you throw in even one or two depth observations actual depth observations. Because it comes down on the biases and errors. And one thing that we have explored for instance is we have given Paul Marantz some backpacks. They are birds and they dive to the bottom in feed. So we can get asymmetry sounding a lot of them actually because they dive a lot because they are hungry. And so there are ways in which we can get our information, that we may not be thinking about with an extended way.
They are never unnecessarily going to be place but they will augment and maybe they will fill in some blanks that otherwise we would not be able to fill in.
>> These is a really interesting concept, from the wave modeling point of view this symmetry is so important, and there are times, where we know that that symmetry and change after a large storm. We can see it in I want wave models, the very fine resolution ones.
That a fax some of, those protected at sure, for inundation models and water level models. Don't run out, it all affects the symmetry. So I think it is a very interesting concept. I don't think we should shove that aside. All right, we are a little bit early here. But is all of our panel, Captain Cruz, and Nick, is all of the panel here right now? We are still missing one more person? We were supposed of start at 9:15 a.m., we have a little bit of time, we can't wait, just give me a heads up when everyone is here. Gary, I wonder if we want to take the time to let's see, we probably I can't hear you? Yeah, that's what I was just wondering, if we want to take the time to discuss that a little bit more. We know that we, we were going to get the resolution too. I do not know about that one page resolution, did you work on that at all? No, okay.
So we don't have the sample resolution, but we can talk a little bit more about what you think as far as the issue paper if you are prepared to do that.
>> Sure, so I e-mailed you so we can share with you the resolution. It was a result of the white paper that Julianna showed yesterday in the presentation, Galen do you have her slight? Because that has the resolution, no? Okay. So as a result of that Julianna talked about the grant proposal that was put out. That references that resolution. So I think the more focused we can bring on that from different groups, the more action we can take quickly. And if you see, at the bottom of the resolution, one of the last sentences is we need to do something quickly.
Because if you read the white paper.

The universities they don't have the students, federal agencies are losing the jobs. So I think it is the time that we can bring focus to this. To help bring that focus to that, maybe an issue paper, not for just that geodesy area but the whole geospatial area. We have been discussing this, I think it is an area that I know state government and the private sector, there is a challenge to find the workforce. And the more attention we bring to that I think the best. So yes.
>> Gary, I wonder, I am wondering if for the session so maybe you can brainstorm and think about the issue paper? A few bullets that we could get together and actually if you could just send them to Virginia or Amber, or myself or whatever. We could throw them up on the screen just for the purpose of the disease is -- the discussion. And to kind of get it going. Send them to Amber. Yes whatever. All right, so
>> So this is Julianna's PowerPoint a couple slides earlier the resolution. Maybe it is the other way, the other way yes. So you see on the right that that is a resolution published back in December. And you will see the last bullet, [Indiscernible]. Just the bottom part? From this distance?
>> You guys at the bottom bullet says America's loss of capacity, and international competitiveness in geodesy, the economic and military implications and some modes of corrective action. Do you want all of them? Okay. It strongly recommends that these serious national challenges be addressed immediately to an ambitious program of educational support, and research funding. In government agency action including address the challenges and opportunities for augment the geodesy capability in support of the national spatial reference system.
With an relevant Federal geographic data committee FD C committees. Providing support within the FDG C committee sees and how geodesy expertise and advances social economic environmental, ecological, intelligence, and military programs.
To advance national security and economic growth. The third bullet augment budgets to sponsor academic training and research, work in geodesy. And allied geospatial fields, we commend the national geospatial intelligence agency for providing leadership. And financial commitment to this effort.
The last bullet is at expediently. All right, great so, like you said, this is the resolution that we can include. There is greater bullets as far as the whole issue paper would go.
>> I think the third one is, we discussed this last night at table. The third one is a role that we feel like the federal agencies could help. Because, the University needs funding and need support. So that one, they are very important, especially the last one. The third one is a key. We can get more agencies like the NGA did to provide funding which NGS is also with their grant. There are other big other federal agencies if we could get them all to take part in this. It would be very helpful to move forward. Just a follow-up on this Gary, and the funding that you are looking for the real need is funding for outreach, and it is not that you have tons of applicants, and you can support the training, is we need to make an effort to convince people that this is an important thing to do. And young folks should pursue this as a field. Is that?
>> Yes, we can have the jobs out there, we can of the funding but if we do not have any applicants? So the first step is promotion of this, of not just geodesy but the whole geospatial profession tract.
>> Saying some of the programs in the e-mail some of the programs just on there anymore. At the foundational level, so I think it's the outrage is kind of taken [Indiscernible] mostly. You have to fund both areas and we talked about this. Survey engineering profession is kind of

disappeared. And I think they struggle with identity. Part of it is because they do not know what to call it. It is like survey engineering is what I came from and I felt lost. So I think, so the issue paper is partly the immediate kind of issue that needs to be kind of supportive, and I certainly agree to support that. How can we issue that more broadly to address things that we talked about discussing you know. You know it was interesting that Julianna slide nine mentioned the feed conference, which is the International Federation of surveys, they still call it that. If you look at the schools their there are two. Member associations, but there's also University listed as associates.
And his two out of the U.S., Corpus Christi and USM. Which is kind of odd. Then I look at Australia that is for, and if you look at the population that should be 40 that should be supporting it. There is something amiss in that general that we need to address.
>> We need a Captain geomatic Superhero.
>> The damage is beyond outreach, we need very aggressive action to survey engineering is dying. These kids, they go they know that they are going to be thrown in the field, and the weather versus he goes to with the same cause of the program in college go to the office or better engineering, civil or structural or electrical for example.
So that is one part, and that has a ripple effect on the program, so they shut it down. We don't have. How many universities in the United States have surveying engineering? To get a bachelor degree? Or even a community college for example.
What we really need, is money to borrow into it, to encourage programs to open and encourage schools. An open scholarship. Very generous scholarship to encourage these kids to go to these programs.
NOAA has a great role and genetic end of veneers and surveyors and data modernization and cord, and genetic networks. So, between NGA, NOAA, USGS, we hope that they can put their efforts and to recover that. Hopefully it can be reversed thank you.
>> All right Nathan?
>> All right I was thinking on both of these comments there is a four year survey program at the University of Alaska Anchorage. It is been a great program it ranges from 90-50 students in the program to get licensed in the state is then surveys. There is no issue it's hard to get students because they already have jobs before they leave the program. So it is the outreach like and was talking about. To bring in more students it to get them trained. And the program itself, has always struggled with that outreach piece. Because Geomatics, try to market that to a student and explain what it is. Try to bring them into feel of the workforce.
>> Good point. Did you have something Chuck?
>> I did thank you, I am totally in support of this resolution I guess for myself I am curious is there any indication over the last three years, or maritime sector for workers and laborers and deckhands and dredge cruise. We have seen the same type of thing. And I am not trying to change this effort at all is there any link to the challenge is or is their unwillingness to work and outdoors environments part of that as well? Is it a combo? Or any thoughts on that?
>> It is a combo with technology it gives the appearance that we use this tool and get results. As far as that crisis were that is critical is other countries are trained in. Jaco geodesy is the foundation that we did other countries are trained in and we are not we are falling far behind. We need geodesy as an explanation and we need. The students that graduate is probably 35 accredited in the United States. In all of those students all have jobs when they come out. We

just need more students. To do that, the technology it gives the impression. And not just in a professional.
But that technology, gives some individuals to think all you need is the tool. But you need the expertise and that knowledge.
>> Gary I would add to the critical lead as U.S. citizens that is a lot of concern from the U.S. government perspective.
>> Correct.
>> Good point.
>> Can I add?
>> Let's do one more comment to wrap up this session and turn it over to our next speakers.
>> Thank you, so I completely agree with Gary and Nathan, especially many of the technology schools and colleges, and the students are not aware, so there is a lack of awareness. With outreach and I think it has to be repetitive. It is a developing career, just the option is not visible to them. Whether we can work it through community colleges, or local colleges. There are avenues DEQ is one of them. We can approach and get it done. It is something to explore.
>> Thank you Galen do you want to? Who did? Tuba?
>> Julie this is a really thoughtful conversation, there is one more topic that at some point, I would like to bring up, I do not know if this is the right time, but separate from this because I do not want to cut the saw.
>> Let's hold that, because we will have time after the next session before we break for lunch. And we will catch you then tuba I believe. We will see. We will come back to that. Nick, Captain Cruz, how are we doing, Galen you did have something? Okay?
>> Galen Scott National Geographic survey I just want to wrap up this conversation. We are trying to approach this, we are trying to approach this in several different ways. I was pleased to hear what Dr. Elko mentioned yesterday about partnerships between federal government, academia, and private sectors.
And then the nonprofits, this is really something that we have to each take our own role. Because as you all know, there are things that government agencies can do and stuff that we can't. That needs to be complemented in terms of the partnerships.
I cannot say NGS is working with NGA, and with NASA on a geodesy practice. We've had a couple of meetings and we will meet in person and coming up in April. So the wheels are turning there. But, the partnership on the other side is a a GS, the American Association of geometric surveys, both of those organizations are being work with and meeting with and they are you know, they are working towards it as well.
And we have the geospatial modeling grant. There is some funding out there that is available, and we have a new chief of our research division. They are reaching out to academia and meeting with those folks.
Letting them know we have an opportunity. So I think the pieces are in place. One think that is not quite there yet, as Christie mentioned yesterday. Congressional awareness is a tricky animal. And I that I think is one thing, that we need help with. So, I think the wills are moving. But I am really glad to hear that this group is going to weigh in on it. Because it is really important, thanks.
>> Great thanks will come back to the conversation we will wrap around the catch you later. So, right now, I would like to turn it over to Nick Alvarado, Captain Ellis cruise. They have arranged a

session on the stakeholder perspectives on maritime transportation, navigation, and opportunities and vulnerability.
>> Welcome to the second day of the panel for tran three I am the regional navigational panel for Puerto Rico and well as Florida. Today we will focus on the stakeholder present perspective on maritime perspective interrogation and vulnerabilities, and how do stakeholders rely on NOAA navigation products data and the services that will enable further economic growth in the shipping industry.
I will introduce all of the panel members one after the other, and then we are going to give presentations. If you will just give me the opportunity to do so. We have the president of the Puerto Rico shipping Association general manager of shipping. She is the first woman to preside over Puerto Rico shipping Association the nonprofit organization that houses Puerto Rico's maritime industry companies.
As part of her role as president, she works hand in hand with agencies both federal and state promoting and enforcing the safety protocols and regulations that govern the industry. She also represents the members in different forms and organizations and interest, both local and international. Inserting the organization in the country discussion on economic development for Puerto Rico. Miss Sosa began her career in the maritime industry with tropical shipping in 2008. At the office and commercial manager and customer service accounting and operation department in 2019 she was promoted to general manager in charge of all operations of tropical shipping in Puerto Rico. She enjoys building strong customer relations that are essential to business success. She holds a bachelors degree in finance.
Next I have Captain Nicolette Bolin, she serves as the chief in the office of prevention for the seventh District seventh cultural district. She is here representing rear Admiral McPherson. This position oversees all of the prevention and safety operations in Puerto Rico, the U.S. Virgin Islands, Florida and Georgia and South Carolina. She is the Marine safety prevention she has been or is been the Marine prevention professional having served a challenging position in her 24 year career. She has previously the office port and facility compliance and recently served as the Coast Guard fellow in the Senate. She also served as a prevention department head at the Coast Guard sector New York. Prior to New York she was a science chief of inspections and sector San Francisco. Before that held up inspections and investigation position at the seventh District prevention office in Miami. Captain Vaughn is a native of San Juan Puerto Rico and holds a bachelor's degree in criminal justice and a Masters in emergency response. Next I have the pleasure of introducing Captain Ben Wade Marine compliance manager for Puerto Rico. He earned his bachelor of science degree and third mate's license in 1987 at the U.S. merchant Marine Academy. She spent the next three years working a board a harbor in deep-sea tubs and Puget Sound and Alaska. In 1990 he left the Pacific Northwest's to find warm weather to work toward acoustic research specials.
I think we have something in common we can talk about it after. In 1992 he took the chief may position a board of one of the NASA solid rocket retrieval vessels. He was in that capacity since 2011. He also earned his MBA during that time at the Kennedy space Center. He joined [Indiscernible] in 2011 as monitor of compliance is based out of Jacksonville, and he provides expertise from the the towing industry to help plan and shape the industry leading assessment programs at Crowley. Which now includes dynamic positioning, engineering and liquid cargo assessment. Captain Wade is associate at the nautical institution Coast Guard U.S. Coast Guard designated examiner and qualified assessor. He holds a Masters 1600-ton dynamic position

Officer certificate time. Captain Hobbie of Figaro over is in San Juan he was raised in Puerto Rico. He got his number degree in Marine transportation and continues his education at Catholic University Puerto Rico law school. He got his doctorate in 2009. He got his career sailing in the Gulf Coast and worked as a navigator and you positioning operator. Later removed to tugboats and ongoing complaints of companies safety management systems. Licensing for all personnel while assisting with the training of personnel. Captain Figaro are transition to working a flow where he was responsible for the safe operation of Company vessels. He returned to tugboats working as a deckhand, meat, Captain, and working his way to general manager. Where he is responsible for the input implementation of [Indiscernible]. He has served as a maritime consultant for various companies, providing a wide range of topics such as maritime law, international maritime regulation, vessel operations. Captain Cousteau is one of nine San Juan Bay pilots. He was born and raised in San Juan Puerto Rico. He started his maritime career working as a ship owner representative while he studied business administration. He then attended the Maritime Academy in the United States. Where he also obtained his degree in Marine transportation from Texas A&M University. Upon completion several years of formal education he joined Royal Caribbean international where he served as the master on the world's largest cruise ship. While working in The crews industry, Captain Cousteau was involved in various projects bridge officer and pilot Cheney. Dry docking, ship revitalization, new built deliveries and navigation research projects. Last but certainly not least is Captain Ellis cruise. He is a harbor pilot for the Southeast harbor pilots. He is the owner of West Indies Marine service and vice chairman of the vice South [Indiscernible]. And worked in the Maritime transportation industry for over 25 years. He served as vice chairman for South Coast Harbor safety committee since 2012. And is on the board of the Caribbean coastal ocean observing system. And has been a merchant Marine in Puerto Rico, U.S. Virgin Islands as well as Alaska and the East and West Coast of the United States. In 2000 he was appointed by the governor Puerto Rico to serve as a commissioner in the newly created Puerto Rico commission until 2013. Two years as president. He was a key player in the development of the L and G terminals. In 1997 he was appointed state harbor pilot for all ports of Puerto Rico. He has a bass of science and Maritime transportation Texas A&M University Galveston. He obtained his third mate license from the U.S. Coast Guard and commissioned as an ensign in the U.S. Navy reserve. He is a licensed merchant Marine officer with the Master 1600 gross tonnage vessel. First class pilot for all seacoast and U.S. Virgin Islands. Our first speaker will be Captain Figaro.
>> So first of all, good morning to all. Thanks for being here. Thank Captain Cruz for inviting me here. And also Nick for all of the guidance. It has been, I did not know, at this time in the month, we would have a lot of things at work. So it all built up, but I was not going to say no to this opportunity of being here. So thank you very much for that. So I see that here we have a lot of people that are knowledgeable about the industry. I already have a presentation basically, for what we do so I will go quick on this. And then go to one of the main points that are that week, usually discussed in the company.
We have meetings weekly and this is one of the main issues. But I will leave that for last. Moran started in 1860, we have been around 163 years. In the maritime industry. We serve around 21 ports on the East Coast, all the way to Mexico, the Gulf Coast, and the Caribbean that would be San Juan. We have right now, 94 tugboats. And we ship assessed more than 35,000 ships a year in different ports. We have around 2000 employees. We are really proud that we are a safety culture. One of the things, some of the things we do is near miss, reports, lesson learned, and

we share within the company and we learn from other people's mistakes inside the company. So, we are in compliance and regulated by ABS, U.S. Coast Guard, ISM, and we are AWO members also.

This is the scopes of the jobs that we do. In said one we just do harbor assist, that is only thing we do in San Juan. But Moran has LNG terminals we have a couple on the East Coast in the Gulf and also Mexico. We also service some LNG ships in San Juan. And the other part is transportation of goods, we have barges, and we transport different types of goods around the East Coast and Caribbean. We also do environmental diving and construction. This is a list of our customers. Some of the relationships that we have had, some of them like for the Navy, it has been for the last 120 years. That means a lot to us. When you are able to apply for that many years. I am pretty sure we are doing things right. The fleet less, is right there. I'm not going to go over that. That is all of the tugboats that we have at this point. One of the transitions we are making is from conventional tugs to tractor tugs. They call it tractor tugs, that is not really the correct term. That is the tugs, but we just use that one tractor to. We have four new builds, it has been a really challenging year for new builds. Everyone is basically on the same page, we don't have, not of people to work on sure to do all of these tugs. And the overhead pass it is been crazy. Something $12 million now. It is so much money. I am pretty sure all of us are having this problem all around the industry, and we are also looking for funding. It is extremely hard. And one of the things that we try to do is try to be really environmentally friendly. The goal at some point is to go to zero emission. These are some of the difference places that we represent. And try to be a part of, in order to go for the zero emissions. That will be the zero admission at some point. That is what we are moving towards. These are the tugs that we have in San Juan, it is an ASD tug. So going specifically to one of the main concerns that we have. Is the sunset of all of the raster and paver nautical charts by 2025. We are going paperless and technology is pushing all of these changes. I am not that comfortable with just going paperless.

Also in the harbor assist, if I have a captain, that is looking at a chart, while we are doing a job, we are in trouble. You don't have time for that, you have to go by your local knowledge. And some ports like San Juan, you can go buy local knowledge it is small enough.

There are some ports you have to go river up two or three hours. So you really need the electronic charts, and also the paper chart right? And most of the shipping companies for the big ones, they will be able to comply with the dual electronic chart display. Because they use the electronic chart display and information system.

But on harbor assist specifically, we don't have space to put that on a tugboat. And also, if we did have space, that is a lot of overhead. And I have used it on ships when a sale last May. And it is a really good tool. Usually you have two that's what you have dual redundancy of charts right? But, in our case, specifically our case harbor assist tugs, the only thing that we need to do, at this point, because we are still waiting on guidance on this.

Is that we need a backup for navigation available. What kind of backup? We still what we think we are going to do is use two computers. And in some happens with one you have the other one. But, we don't have at this point any specific coverage for our type of vessels. What are we going to do to correct the charts that have been sunset? Because you can still print on demand. That chart is only as good as the last one. Any changes you have to go again and print again until it is sunset. So until we don't have any specific guidance, we are on a little bit of a limbo

until we address that. I am pretty sure one of the main reasons we have this type of conference is to put clear to the public but we're trying to do on that scope.
Them something later on that I would like to get a little more specific answer on this. I know that NOAA is good about this, and sometimes there is going to be [Indiscernible]. Being that this sunset of all of the nautical paper charts are going to be in 2025.
At this point, we only have 20 months, for a total sunset. And we still don't have an update on that navigation. So by the time maybe, that is nab it comes out and we have guidance, we will have about 72, 7000 vessels that are in the same position, that are waiting for the guidance, that we still don't know how we will address it?
You will have 7000 vessels looking for hardware, software, and the most important part of this is the transition to using electronics. So, if this keeps taking time, maybe we will have 12 months to find all of that hardware and software to train. That is usually the main worry that we have at this point that we have for our industry later on we were all set down, we will have a lot more answers when we do question and answers and all of that dynamic. At this point that is the main worry that I have, and I will leave it to the next person on the panel.
>> Our next speaker will be [Indiscernible].
>> Thank you, I want to thank [Indiscernible] and Alice Cruz for the shipping Association to the panel and definitely to the event. And thinking for making is part of this. As Nick mentioned, I am the president of the Puerto Rico shipping Association. A nonprofit annexation that houses were more than 35 members of the nerve maritime industry in Puerto Rico.
We are the only shipping organization based in Puerto Rico. Why this is so important, because we are an island that imports almost 85-90% of the goods that we have here locally. We know how important the maritime industry is for Puerto Rico. With that being said, as I mentioned, the Puerto Rican shipping Association is 35 members within the maritime industry. Our members that I am proud to say as well that many of them are represented here this morning in the panel.
Recognize how important it is the maritime industry and we carry the job with a high sense of responsibility. We are so proud of the members that we have within that association.
We had of diversity of members that include from domestic and international carriers. Terminal operators, shipping and cruise line agents, tugboats, and many other interesting service organizations, all of them committed to serve our island with highest service standards.
As an organic station, the only shipping station in Puerto Rico, we represent our members in many different forms, with federal and state agencies. We were telling Admiral Evans on Monday and Captain Cruz. We want the federal agencies and the local state agencies see the Puerto Rican shipping agency as an alliance between the 35 companies the maritime community and government.
That is specifically our mission when we look it up at the mission that we have as an organization. As part of our role, that is most important. When you have [Indiscernible] conference June 1-November 30, it is very important that members understand. We need to work actively in our business and continue to plan and ensuring. When ever we have an impact of a hurricane or an earthquake or any other thing or any other atmospheric event.
We are ready, just to, we are ready and prepared the most important as I said that we recover from the event. We established commercial vessel operations. I have to say I am so proud to say this. After category five hurricanes, the maritime industry was able to be back attending commercial vessels probably two and a half days after the impact of hurricane Maria. The

hurricane season, because of the commitment of the members that we have within the maritime community. And how do we do this, with initiatives like this one, where most of the time during the year, having meetings and conversations with U.S. Coast Guard, U.S. coast protection and local agencies. Just to ensure that what would be our course of action if we do have any backup of atmospheric events.
I would like to share facts from the maritime industry. 2022, we imported 1.1 million in Puerto Rico. We manage more than 60 weekly vessels in the San Juan Bay. We managed as well 1.5 cruise passengers during the 2022 as well. And as I said the maritime industry was properly up and running two days after the impact of hurricane Maria. Concerns, I did like the word that you mention. National concerns that we might have. And this is something that we will discuss with Captain Cruz and Admiral Evans on Monday.
There is only one port in Puerto Rico. We don't have a second port in Puerto Rico ready and able to attend in the event of emergencies. We might be talking about hurricanes but we know about two or three years ago we had a and irk quake. -- earthquake. There is a concern that anything happens that will jeopardize same one port in San Juan Bay what will happen to Puerto Rico? What will happen when you import 90% of the goods into Puerto Rico. I know this is something not directly related to NOAA. This is something that we want to bring to the table and government of Puerto Rico and federal agencies as well. So we want to make sure that we bring this discussion to today. To see how we can get assistance from a NOAA and other federal agencies to echo this to the U.S. government. We need to have a concern. Other ports around the island, one of the ports that we talked about was the port of pensée. There have been cranes that that have not worked properly for more than ten, at more than 30 years they have not been working. So one of the things that we as the government again. He is trying to put those cranes back and running. And to maintain those cranes just as I said. Whenever we do have an atmospheric event that will impact her jeopardize bringing commercial vessels into San Juan Bay. We do have an option to continue with the maritime community of course. And you know the supply chain that is so important for Puerto Rico.
I know that some portions will come, but I want to recognize the job that NOAA does in the navigation charts and the water levels available to captains. To plan vessel schedules and service the island in a safe and efficient way so thank you very much for the job that each of you do. We do recognize it and appreciated. Again, I want to leave because with this. We looked at the Puerto Rican shipping Association is an alliance between this maritime community. I know it is hard to go to 35 different entities and companies, so the way that I like for people to look at the Puerto Rican shipping Association. Is that we are here to assist and to serve you, and neck I know we talked about this.
We want to put the Puerto Rican shipping Association at your disposition to perform work for any conference. And how to be used available products that NOAA has out there. Anything that you may need feel free to contact the Puerto Rican shipping Association. And I'm pretty sure afterwards we will have questions and answers thank you.
>> Will take you up on that offer. Our next speaker will be Captain Wade.
>> So I work for Crowley, you probably never worked for -- probably never heard of it. We do a lot of container traffic coming in and out of the island. We are pretty proud of that. That is one of Tom Crowley's favorite things is being able to service the island. A lot of what Crowley does is in the petroleum industry. Myself Crowley what I do, is I specialize in navigation safety. On board our ships and togs. So to do that I split my time either working in a simulator, Mariners or

I spent the rest of the time writing on board the vessels as they move from one port to another. So I can see how our guys are doing on the bridge of the ships.
We will call it their natural environment I guess, so what I get to see is all the practices that they do on a real basis. In order to keep the vessel safe. As they transition from one port to the other. So yeah, when they said in my bio I did not know he was going to read the whole thing. I will skip that. On the assessment a lot of what I do especially in the simulator. I am trying to determine whether the mates that are standing watch on the vessels, if they are able to apply the skills and apply the knowledge that they learned at the Academy. Our philosophy, or at least my philosophy, there is a big difference between knowledge and skill. Knowledge is what you need to pass a test. That is what the Coast Guard offers for us is a written exam. But just like when you take your drivers license, written exam, the next thing that they have you do, is demonstrate that you are able to apply that knowledge behind the wheel.
That is sort of where I come in. We take brand-new graduates from the academy, and we put them through similar assessment. And we look for gaps and their skills, and we try to apply training to enhance that. I do the same thing aboard our ships, the main difference aboard the ship is number one I cannot control the environment. Like I can in the simulator. But also, if they are not doing what they are supposed to do. I tried to find the reasons why they are not? And sometimes it is a skill gap. But in other times it is a rule that they just simply are not able to follow or not willing to follow. I will get more into that.
This is a little quote that I found about workarounds. I found everybody as a work around for something that they do. But basically what they are trying to do with a workaround, is to circumvent some sort of obstacle that is keeping you from doing your job. So I want to talk today, about contours. On the paper charts, the original intent of the contour lines, so basically the lines that connect the similar depths. What they are therefore originally, was to provide the mariner with sort of a visual pitcher if you will of what the bottom looks like. Is it long and flat? And come up very gradually? Like out in Puget Sound or here where the bottom comes up rather quickly. The contour lines sort of tell that story. Because we cannot see through the water. The current purpose of: Tour lines on an electronic navigational chart. Is that there are, they can be set by the user. It is not just on a paper chart you might see a 20-fathom chart. On the electronic chart you have the option of setting contour lines wherever you want them.
At least that was the intent. But what they can do, on E and C, is they can draw lines on the chart. Contour lines on the chart, they can't go with the shift areas or where they shouldn't go with this shift. And areas where they can go. I wanted to talk to you about this is sort of the company, this is my target audience, the Crowley coastal tanker, we have a couple of dozen of these running around the ports in the U.S., occasionally I guess they come down here I am not sure. The average it involves somewhere between 8 nanometers and the load is between 10.7 and 12 meters.
This is a electronic navigation chart. That draws a line between where the water in the ship can flow and where cannot. Very basically. The shallow contours represent you crosses line you will be on the bottom. In our industry standards, where we draw that contour, where we determine whether contour is going to be we take the deep draft of the vessel, we at the squad which is the amount of extra depth that the vessel gets as it moves through shallow water and speeds. And that we came up with a number. It is going to be deeper than the shallow contour. It is to show the navigator, it is a boundary between where there absolutely safe, and an area where they can go. But probably does not want to spend a lot of time there. So here, is you think of it

as a car driving down the road, they have lane markers on the road, and somewhere off the pavement, you have dirt or ruts or maybe a ravine that visualization would represent the lane markers on the road. You want to stay inside those lane markers, and the shallow contour that would be with the pavement ends and you end up off of the road and you do not want that. Finally you have a third line called a deep contour, which there is a not a lot of, guidance in the industry about what this number should be. At Crowley what we do is set the contour to be it differing essays the line between where the vessel might experience in deeper water, and where would likely not. And so it most U.S. ports these days these are the contour settings, basically what happened is when they decided they were in meters, all of the hydrographic agency scrambled art in order to get meters and they converted these from feet to fathom. And then they added and ended up with some odd looking numbers on their contours. You know they look they are on the far right column. 5.9, 11.8, so unusual numbers for somebody who has been used to looking at a paper chart. That have a 20 fathom curve and so forth.
The good news is, that NOAA and the hydrographic agency is working on a Metro vacation I think that is the word that they use. Of these contra lines, and this illustration, you get this off of the webpage, and this is the area up in New York I think there is also areas on the West Coast of Florida. Where there are basically re- drawing the contour lines. So they and up in round numbers. This is awesome, this is up in New York and the West Coast of Florida. This is what the contour intervals look like. So if you take a standard approach chart, you have a contour that is possible at five and another one and ten, 15, and 20 meters and so on.
This is great, the round numbers are really great. But, it also falls short I think of what the designers of the system have intended as far as what these condors could do for the mariner. Because the way the system is set up, is that where ever you have a shallow contour or a safety contour set up on your that are either and their see, your system will alarm as you approach those lines. This is a great help where the line is where you wanted to be. But it is not extraordinarily useful, if the line is not what you needed to be. And so what I want to call attention too, is basically the huge gaps between the ten, 15, and 20-meter contours. If you look at the 2020 data from the Army Corps of Engineers. Almost one third of all sailings in U.S. ports, are vessels that draw over 10 meters.
So that is a huge population of vessels that are only being served, if they are already drawing 10 meters, than the 10-meter contour is not going to work for them. There shallow contour ends up being around 15 meters, and the deep safety contour is closer to 20. If you are drawing 10 meters, you don't need an alarm if you are approaching a depth of 15. It is not useful. So on a ENC this is what it looks like. This is Scotland light approach in Sandy Hook. So if you have an 11-meter draft you might set your shallow contour to account for your squad. You might set it at 12 meters. You add your safety factor for the UK see, and you will end up with 13 and the deep contour closer to 24. So you can see the problem that this leads to. You have a Channel, that you are supposed to be in. And zero color differentiation, between the water in the Channel, and the water outside of the Channel. And that is a problem.
What do they do? This is the part you not supposed to listen to. So, what do they do? Well in order to be able to see the Channel. They lied to the system. They say we are not drawing 11 meters we are only drawing nine. And so that they will put in something less than nine, in order to get the contour that they need. This is why I had the workaround quote in there. So they will do this in order to be able to navigate in the Channel that they are supposed to be in without getting an alarm. And so what they will do probably, up in the top left corner, they will draw

and, you can hand draw a no go zone. But you cannot do that for the entire transit it is tedious. It is not what the designers had intended. The good news, the good news is, and I was only able to find this in the L.A. Long Beach area. Very recently released L.A. Long Beach has high definition ENC. for use in the harbor. They banned anything from the 1-5000 scale. So this screenshot was taken with a shallow contour with 12 and a deep of 24. The Channel depth coming into L.A. is pretty deep it is 25 meters. It says that in the lower left I forgot to remove that from the other side. But basically what you are looking at here is all of those lines between the light blue and the other blue. Those are all contours. I could have set their contours at 15, 16, and 17 if I want to do. The entire area, in L.A.-Long Beach, the deep water boarding area up to the docks, is all in this 1 meter granularity on the contour. You can set it at anything that you want. And it really needs to be like that everywhere. This was 2020, so now you can see like, if I had these options, I could follow what the industry standard is telling me too do. As far as, my draft at what ever it is, plus my spot, plus my tolerance for UKC. And I can make that for exactly what I wanted. Not only that, but having this level of granularity will also lead to other really great things. There is a guy, he is a professor at the University of New Hampshire. His name is Alexander he's been kicking around for a while. In 2001, like a quarter century ago he had a, he had this idea you could make this ENC, title wear. Is he in the room, you are laughing? So he built this model, he said this is great we can make a tide or an ENC. if you have an electronic navigation and a long-range a tide and you can't go in the low tide but you can't win at high tide, there is nothing in this super high-tech world that accounts for that. It is just not in there it is not part of the system. Part of the reason for that, is the tide range is usually less than the granularity of the contours. And so what you end up with is a system that could adjust, but the contour is not going to move. Because your depth went to 13 to 14 meters or something. But with 1 meter granularity you can do that. And he prove this, but back in 2001, he had to find a port that had actually that kind of survey data. He went to Rotterdam in order to be able to make a model or demonstration. Well, now we are there, it will at least in Long Beach we are there. And once you have this level of detail, not only can you account for time. But in theory, you could also start accounting for squad automatically depending on the speed of the vessel. This is where we need to be going. I do not know if this will be widespread. But this, this I am actually shocked that the hydrographic agency has not played the sophomore. I went looking for articles and I have found nothing about these high-tech charts in L.A. So that is my conclusion. I think that the deeper draft vessels the ones drawing over 10 meters are underserviced. And that needs to change especially because we are trying to move more cargo with more draft into smaller places. With less tolerances, and we need to be able to see where we are going and that is all I got.

>> Thank you very much you touched on the precision marine navigation topic and your last comment. I'm sure that will come up in the Q&A questions. I would next speaker is Captain Vaughn.

>> I don't have any size today. I do appreciate the opportunity to speak with you and speak alongside our industry partners here. It is great to hear some of the challenges, although I did not hear any of your presentation whatsoever. It is great to hear some of the local challenges that we have here in San Juan Puerto Rico. Again I am a native from San Juan. I was born and raised here. You know it is good to see NOAA here giving attention to the needs of the island. So, I want to bring it up a little bit. Again, I am here, representing Admiral McPherson. He is a district seven admiral. And I would be remiss if I were not too if I would not, mention that

humanitarian crisis that district seven is managing right now. Meaning, the migrants situation that we have. We have seen an increase number of migrants, coming through the Straits. What does that have to do with the meaning transportation system? Well, as we increase migrants, and the Straits, we have vessels that are encountering these migrants while out at sea. We also have an increased number of stowaways that are coming into our ports. Which means we have security issues and concerns as well. And that well and could mean you no delay to commerce as his vessel come In-and-Out of our ports. So it is a concern that we have. I think it is something that we have recovered about 10,000 within the past couple of months. You know which is an amazing increase to the numbers that we have seen in the past. And I think we are getting to numbers that are similar to the 80s and the '90s. So it is a concern. We certainly appreciate the support that NOAA is giving us even through the Maghreb crisis. We do have NOAA representatives within the incident command post in Miami. And the way they are helping us is specifically with what weather and waves are doing in the Florida Straits. To kind of pre-determine whether there is going to be a high rate of migrants during a weekend or not. So we certainly appreciate all of the help that NOAA is giving us.
Back to the topic of Marine transportation system in the topics. It is good to hear some of the opportunities I do want to discuss some of the opportunities and the challenges that we have at a more programmatic level. I was talking to the prevention folks in San Juan, that work here in the Marine safety yesterday. I think everybody understands our focus, number one mission for the prevention of Marine safety folks, it is the protection of the Marine transportation system. To make sure that is resilient in order to accommodate and outbound cargo. Challenges that we have, obviously infrastructure, we are seeing a decrease in shipyard availability available shipyards across the nation. Which means that, it impacts our ability as a nation to fix or construct vessels applied by the United States. Facility, safety, and security is always a challenge. Without a facility you don't have a Marine transportation system. So again, one of the, those are one of the challenges that we have, is upgrading those facilities to continue to accommodate the larger vessels that we are getting as the system grows. Waterway congestion, we see that more and more nationwide, we have new programs such as space now, that is a new competition for our waterway, we also have when farms coming to the area. I am not sure if everybody is aware. The infrastructure reduction act did open up San Juan and the Virgin Islands Puerto Rico and the Virgin Islands and other territories for wind farm development, so that will be another challenge, to the islands as far as you know, and obviously you have cruise ships right coming In-and-Out. How you manage that? With the wind farm, depending on where they are right? So those are new projects and new issues not issues, but new challenges that we are seeing, as far as the construction of our waterways and how far we can push the system itself. Some of the you know, I'm supposed to talk about supply chain resilience that is one thing that is important to us especially after hurricanes and other natural events that may impact the waterway, we do have all the see some hardware that we have out there that the Coast Guard maintains. They are aids to navigation. One of the things that we are looking into in order to open up our ports faster, and we have done this in numerous ports like New York and L.A., we have been institutionalizing navigation aid one of those physical aids are gone. We have found that as an excellent two to help out in ports faster and have the vessels coming In-and-Out. But you know ships are getting bigger right? We are seeing a lot more, and, that is again another challenge that we have and that what we heard about our partnership yesterday, so I certainly want to I appreciate the U.S. Army Corps of Engineers. I know that they will be they

have a project, that we will be deepening the port here and San Juan harbor, so that is excellent, and we look forward to that as well, and assisting them with that project and I think that is starting the summer, this coming up summer. So we will see bigger ships in San Juan which is a good thing and could be a challenge. Lastly I want to talk about, you know you talk about the Marine transportation system as hardware software and the waterway. But I think one of the main challenges that we are seeing, and not just the Coast Guard, but I think the. Throughout is the people right? We don't have enough people we don't have enough people that are trained, we are not getting enough people coming up to the system. And again not just the Coast Guard, we are seeing it through the industry as a whole. But even with the people that we have, you know one of the most important things that the Coast Guard is focusing on now, based on something that Congress mandated, and it was mentioned yesterday is the sexual assault and sexual harassment issue. We do have a Marine safety information bulletin, that I will provide to Dr. Nick and I will make sure everybody here sees it. But the bottom line is, if the Coast Guard finds any sexual assault or sexual harassment case going on on a U.S. vessel, it will not be tolerated. And that is the bottom line. If we want to continue to improve our system and you know our industry then we need to work together to eradicate those types of behaviors. I will provide that and make sure that everybody has it, we are trying to disseminate that as widely as possible. So, it is definitely a priority for us and we will continue to make that a priority. And that is all that I have thank you.
>> Thank you very much Captain von. I'll last speaker is Captain Gusto.
>> Good morning everybody is a pleasure to be here and collaborate on matters of safety and support in our harbors. The pilots were very reliant on your products and services. We are concerned with climate, with weather, we are concerned with tides and currents, and obviously charge and publications. So, I hope that today we can share thoughts and information, I will not go around explaining or telling you what pilots do, because I figure everybody knows that. I could tell you a few cues ships jokes but maybe that will be for later, I would rather use my time for an interactive session of questions and answers I'm sure there is a lot on your mind and there is a lot on our minds. And with that Alex if you would like to take it away. And let's open up the floor.
>> Thank you Alex did you have any closing remarks on the topics before we go into the Q&A.
>> Yes, first of all I want to say thanks to our distinguished panel is, taking their time and coming from home and abroad. Very important what the captain was saving -- saying. Up the contour because ships are getting bigger. Channels have been dredged. So if the clearance for them is coming to a minimum because they want to maximize the cargo that is being moved to the transportation system. The same problem as Sean mentioned with the bridges and the navigation channels that has overhead clearance with bridges. So that is extremely important that NOAA seems to look at those products, so we move our supply chain constantly, without destruction or having an accident. Or a grounding. We've seen a grounding over there on the East Coast the car carrier. The Golden Ray, it was a big accident, they spent tons of money to salvation that ship and the navigation channels. Regarding the other things that was mentioned is extremely important going back to Puerto Rico we have seen our difficulties of what we have seen in Hawaii. But also that we problem with the small ports. Everybody concentrates on the big ports, but we have to support the small pores. It is important to the silent, because the small ports in Puerto Rico, they do represent energy. We bring to the sports diesel, gasoline, LNG, and coal for power plants. We need to maintain those supports for those small ports

those ports are federal ports and some ports are not. So the federal ports the Army Corps will do soundings, and maintenance on one, at the older ones that are not federal ports, we rely on NOAA data for soundings and those kinds of stuff. But is extremely important we look at the small ports but they are actually extremely important for the livelihood of the island thank you.
>> Thank you Admiral Evans, during your absence, Captain Wade had mentioned the notion of tied response of E and C, which sort of brings up the precision navigation. Would you like to speak to that aspect a little bit?
>> Sure, apologies, I had to step out and I miss the beginning of the panel, I am very sorry to do. But I did come in at the tail end of the discussion about contours. And the tide aware chart. You've heard this miles around the room, because these are things that we have been working on for some time. I think your point, you have not seen this publicize, it is a really good one and that is a good data point for us. It tells us that we need to be doing more to get the word out on the programs. But what Nick is alluding to is the precision navigation program, which is our vision for the next generation of navigation products and services. It would do exactly what you are describing. We are in the process of re- scheming our electronic nautical charge. And one of the benefits of that, will be the densification contour. What you see currently in the L.A.-Long Beach area. That will be coming eventually sweet wide. But were focusing on the ports in the areas for the exactly the reason you noted where it matters the most. With that, I think the panel is aware, what that requires i not only that we complete the re- grading of our ENC, And connecting data into that and that is the source of the symmetry that will connect densification of those contours.
So that is a process that is ongoing. It is not whizzing fast enough. And we are taking steps as I mentioned yesterday to accelerate that process dramatically. Though, as noted, yesterday nothing is free. So it is a balancing act of what we are not going to do. In order to accelerate that E and C regrading and re- scheming process. Specific to the tide aware chart, again I mentioned the precision navigation program for the next generation of sweets and products and services. Based on that hydrographic organization as-100 model of products. That will include a new chart standard, which the IMO announced last year end will go into effect in 2026. It is the S-101 chart. That will replace the S-57 chart eventually. There will be a significant period of what we call the dual fuel. Both of those charts will be in place. But starting in 2026 they will be permitted to produce units that can read the S101 chart. We are organizing our workflow to begin production of S-101 charts, certainly not sweet why but local areas starting in 2026. Or that is the target. But in addition to as-101 based chart, there is a S-102 product which is overlay. It would suit there are also products for real-time water levels, real-time surface currents, and product standards for those, that we will roll out. That data is available currently but now you have to go to multiple places to look for this. The pre-navigation program and the S-103, all of the data and products would be available from a single place. They would display in a common operating environment. In your rosepoint or ECS, so you're not doing the mental math. So it is all of that would be synthesized together. So, I very much appreciate your comments, because they are consistent with the vision that we have, and we think the demand is, and I also appreciate your comments about we have not done enough to talk about this. It is coming out.
>> Yes thank you Admiral, certainly one of the concerns that I had. It has to do with the enormous volume of tonnage that occupies over 10-meter draft range. And that, I mean, yes it

is one third of the vessels, but it is an overwhelming amount of actual gross tonnage that is operating in the area. We are not really using the system at its fullest right? Yes thank you.
>> Thank you Admiral, I do not need to monopolize the microphone, but are there any questions or comments from the panelists that you want to hear? Yes, yes we have?
>> Thank you, great presentation. Being a fellow mariner I completely understand we are coming from so thank you. Just some thoughts, I want to highlight and get some more clarification on perhaps. A lot of places in the world are having challenges moving away from paper charts. But they are accepting the change, and that management of change has to be done. It is really a management of change, they are better and safer and much more data and the quality of the data. But the management of change has to be managed by a company and perhaps by an association. To help them work that journey. That is perhaps the key factor there. Because many parts in the world I using variances designed for tugboats and smaller vessels. And they work and they work efficiently. So, we don't not have to reinvent the wheel, but it is already there. The more we deal with it we are only fooling ourselves, so that is something to think about in that space. Secondly, I want to highlight you know, when we talk about the standards. I mean, as recent as December, realizing the shortcomings of the regulations. So as much as new standards come up as tools, simultaneously there are many factors that we have already got a higher product in place. Ships with these enhancements available to you. They are added on enhancements that you pay extra for. They don't go for base time or level requirements. So that is perhaps one of the challenges which we see happening. On the sash side, I know there are various workgroups at MTS and Coast Guard. My challenges still, why is the Coast Guard not looking for sash under port state control on every vessel? Why are we restricting ourselves to U.S. flag only. This is a global issue, it is a human behavior issue, it is not a nationalistic issue. It in fact impacts the safety of all of us.
>> Thank you for the question. We are not only, and I know I said U.S. vessels. The reason I say that, is we do control as a flag state, we do control the U.S. flagged vessels. We do a license though mariner's onboard those vessels. We do take enforcement action and suspension and revocation for those manners.
If we find, or if we have a whistleblower that comes forward during the ports control exam, we will absolutely take action. However, we have to work with the flag state. In order to hold accountability for the mariner and do the investigation. That falls on the flag state, there are certain things that we can and cannot do as a flag state and as a port state. As a flag state, that is our, that is our responsibility one 100%. As a port state, I think we still have to figure out how that mechanism works.
>> Just to give you background on that. When incidents have happened in international waters in port states and fla states and they are investigated they go back to IMO. there is a mechanism in place which is working. The situation is going on for eight years. The system is dragging their feet. This is a criminal issue. I wish I had another phrase for it. This is just not acceptable, and we should be moving faster in that space. That is how a lot of the community around the globe, and I think the Coast Guard does an amazing job. Why not lead as a beacon in that and get that going rather than holding back? The request?
>> I think we are, I think at the headquarters level, I definitely think we are because we are putting products out there. At the district level in the sector level, the operational units, I do not know that we have seen a lot yet on the ports stateside. But we have seen it on the U.S. to make the site.

>> I just like to make a comment about that. I think what we are talking about here is educating people it is education. I think we have to invest money and that in itself. And it is a cross the board. I office he was involved on the update of navigation systems, and is very complex integrated bridge systems, and cruise lines invest mind's eye using cruises as an example. Because they have the cash to invest and they train the Mariners in the systems a little bit more than I am finding now as a pilot over the past three years and some foreign flagged cargo vessels in particular. And the problem of education as I said across the board. One thing at least I did as I was going through the ranks, as a safety officer went I would train crew members and we had 2000 crew members to train for duties and preparedness. It was to explain the why of things, the background of things. And that proved to be very useful as they continued their daily duties. Of course if they were ever faced with an emergency. Simulators for instance, are very, very powerful tools to get all of this going and tied together. At the moment, I am trying to digitize the Bay of San Juan. We are working to try to get proper symmetry so we can now not only train people but do research projects. And I understand there is funding that goes into this. But federal associations and collaborations have done. So, thank you for your comment, because it all goes back to putting in the time to train people. We have to understand these are the standards. And the way that we look at this and the depth contours and shades, have to interact even though the U.S. makes the charts with the rest of the world. So for those of you that go to the IMO, and speak there. That's a place to remind people that the put in time, money, and education.
>> Thank you very much, this is eye opening, for highlighting the challenges that you have, and the importance of NOAA work. That is reaffirming our belief. I go back to similar weight about the ENC. the granular of the contours is not a big deal. But we need to make sure, the accuracy. The definition of the topography, of the ocean floor supports that. And for Admiral Evans. [Indiscernible], I will apologize I am not familiar with the ENC structure and design. It bit is generating contours this is not the right way. We talk about electronic digital, it should be on the fly. I want to create half a condo for my ship, and it should be on the fly. And that I think it is missing the committee for not dumping to digital. Digital will have all of the slides. It will be added and updated automatically. You don't have to worry regarding the sheet and so on. There is a lot of forgoing in the background we can eliminate by having active database. Real-time goes to [Indiscernible] if he needs it. My question to Ben as the mariner community ready for dealing with digital topography? The reason I mentioned it. Contours regenerated 100 years ago or over, the purpose and the sole purpose of: Tour is to represent topography on paper. We don't have shaded relief and colors. So the only way to show you what the elevation is is to draw the contours.
American society [Indiscernible] in 2004 we eliminated the scale in: Tour [Indiscernible]. All digital [Indiscernible] the beauty of that contour like you mentioned when they give you 5-meter contours. You are missing opportunity it is much more detailed out there. But when you generate contours that is 65 meters, you don't have details between the 5 meters. And the clearance could be 2 meters for example. While if you deal with digital you can navigate whatever accuracy the detail could be 30 centimeters or 40 centimeters. So I just want to bring attention to this. Contour is not the way to go. Unless you using a paper map. If you are using digital screens and hopefully like the ENC, the way to look at the terrain and ocean bottom is real topography. Not the contours thank you that is all I have.

>> Yes that is, it all very much depends on how you look at it. When the designer of the Ectus, and designing what it was to do someone thought it was a great idea to make a system alarm if you approaching a contour. If you cannot have the contour where you want it, then you get an alarm when you don't want it. And what that leads to is an excessive amount of nuisance alarms that are going off on a bridge, in a time that is the least welcome sound that you want. And the problem is, you can't tell the difference between an alarm that actually means something, and one that is just telling you something that is not important or a nuisance. With the improved accuracy of the contour. Being able to put the contour where you want to, not only does it decrease alarms. It improves the watch standards attentiveness to the alarms. Because it is a higher likelihood that it was going to be something important. And that is my comment on that.
>> Yeah, I do go to the bridges all of the time because that is my work. And they are absolutely right. Sometimes we need an alarm officer just to silence the alarm. Nobody is paying attention to it, because they know silence, silence, sounds. If we get an alarm that really means something is going to be overlooked. So it is really important that those settings be managed the proper way.
>> You're absolutely right, so generation won of Ectus, was an issue. Generation to
>>wo, you had better models from the manufacturers. And today I believe that working group are still going on. When you are looking at new standards, which will give you the full capability to be intelligent in that space. And they are working in that space. So like I mentioned, about the circular. This is been a table that I have seen several times. Yes it is a nuisance, but it is gradually getting better and better. But I agree with the customer saying. When you are looking at a port size it is still the same, the Channel is still the same, we are trying to fit in bigger ships. Trying to more -- trying to do more dredging. And if we do not understand the 3-D dynamics of how it is working, that is what precision navigation is all about. Yes, you need the alarms I had completely agree on that. But that is each shift, each transit, it is a different graph and different title conditions. All of those factors would come into it. That is where we are progressing on this.
>> That is because when you deal with to Fort contours, and you try to squeeze a ship, you need 1.8 meters for example. You do not know if this is possible or not, if you are looking at real topography, you will have a clear idea, because to meters, is all of the detail in between, you jumble from 2012-2014, and why you have the 50-centimeter to pass it.
>> Admiral Evans you want to chime in?
>> You can go for yes, so I just want to address something about the Ectus. there are 7000 vessels who will not be able to put this on their ships. Specifically like we do harbors, it is one person we have to answer the phone, all of the alarms, and last time I said on a container ship. I remember that, the hardware is really big. So on these bridges on harbor assist, we don't have a space to put the Ectus. yes like a computer that's RAM going with all of this, there is nothing set for those 7000 vessels, and by the time something is out there. There is going to be a lot of people looking for hardware, software, and training. If we could putEctus. this is something we would not talk about.
>> I'm sorry to belabor this point, look into the international arena is already there.
>> We need the guidance from domestic because we are U.S. flag.
>> We know you have the associations, and there is a lot of precedents out there I agree we are behind, but I think the capability and capacity of which we can't adopt and work. But thank you.

>> We are discussing basically the presentation in the data on the screen. But to your points are. The quality of the data, the amount of detail that you have of the metric survey is what we would like to somehow be able to see on the system. The reason is the two aspects there is Channel keeping an in and up on transit speed. That you are concerned with squads and increase draft into a healing angle and so forth. As you get closer to the birth, it is very important to understand what is happening underneath. Even as a pilot and having local laws. The need to have more surveys done. So perhaps one of the things that I have done, and been involved in, is discussions and trying to have some sort of sensor and technology installed on ships. And share information, ships that go In-and-Out of ports are able to collect data was sewn up. You cannot survey harbors every day. In Puerto Rico for instance, after the hurricane passes by. Everything changes. I'm not talking about sunken debris, I'm talking about completely different underwater contours. As shipped departing from her birth every single week, twice a week, they go behind the ship. If you go behind the ship and try to dock you will stick your nose on the ground. So this is the kind of data, at some point we do have the technology for it. I have seen it modeled in simulators. When you can see all of the ship and you can see what it looked like and you are closer to her. When I have an anchor I have a foot underneath and caring oil that is a big concern. And those are the tolerances we are dealing with, 1 foot.
>> Thank you all for your time. This is a really spirited discussion which is great. I want to bring the topic back to what we were talking about. We started with safety and we ended with Captain Von talking about sexual assault and harassment. Yesterday we had an interesting conversation, and one of the things that impressed me about the conversation about talking about the fact that sexual assault and harassment that is the endpoint. There are behaviors that slowly escalate to become that. What we really need to do is nip it in the bud. Stop the behaviors that escalate into these crimes. And she talked about how they are having these difficult conversations and doing case studies and making people realize was seemingly small behaviors and jokes slowly escalate right?
I feel like we all have a role to play in this. Shipping companies have a role to play. Pilots have a role to play. Shipping associations have a role to play. Certainly compliance managers have a role to play. So I would love to hear more about, how each one of you might be contributing towards the change in culture, that we really need to have, in order to not just tolerate assault and harassment, but also not tolerate the behavior that later Ron will escalate to become assault and harassment. Thank you.
>> I will take that, because obviously having worked on passenger vessels with crew members we dealt with this quite a bit. It goes again back to educating people, and discussing it and preventing it. If you hear something and see something you say something. But locally, I can tell you and I'm happy to report, there through collaborations with shipping associations and other partners. We bring about issues around mental health for instance. I would like to say pilots are the eyes and ears. In my case of many federal and local entities we work closely with the Coast Guard. If we see something we reported. We have one of these discussions in the harbor safety committee meeting we brought this up, because take covid-19 for example. Because of all the restrictions crewmembers have, and going to shore. Many crewmembers are spending nine, ten, 14, 26 months on board. As it was the case with the chief mate. And when these guys can't go ashore and they're stuck on board these behaviors start to come about. Even though we train and educate, unless we collaborate with other stakeholders in this case around ports in

Puerto Rico, we can't really do much. So again I'm happy to report we are discussing it and looking after criminals across the board in that sense.
>> Really quick admiral, with all of the discussion about the improvement and the fidelity of the data. Is it safe to assume that the Corporation between NOAA and the Corps of Engineers which does the mapping inside the harbor. All of that is going really well?
>> It could be better.
>> I was say in general yes we have outstanding relationship with the Army Corps. The I think, as we have heard yesterday, there are fundamental differences between the way and reasons that Army Corps does survey work and the way and reasons we do survey work. Sometimes those fundamental differences of approach, get us talking passage other a bit. What I mean there is, Army court does high drug or fee for Channel condition assessments. And for dredge volume calculations. How many cubic yards of material do they need to contract or have the in-house fleet removed? Was that in fact removed and is the federal Channel of the specified depth. They are less concerned with the absolute symmetry. Which are received we are very concerned with. So as long as we understand each other's perspective the collaboration is good. And I would say it is strengthening, we have a very active group amongst the navigation the Coast Guard Army Corps and the office of Noah and they are addressing those sort of issues. And the problem of getting them out to the Coast Guard and the dressers. I did, and I don't want to if there is more to talk about on sexual assault and harassment topic I don't want to take us back to the technical topic so I will pause before same thing with her.
>> I will go real quick with this, the only thing that I can add to what the captain said, is an example, and this happened with us in Moran, I was recently joining Moran at Norfork and I was training to be a captain, and I could call on the star Captain he was really I have never seen anyone with that amount of skills on a tub. We had to take a tugboat she's a female and she is a captain, this happened only once, it looks like they started talking, and he said a text message she was not supposed to send. On the spot Moran decided to fire. It is more also that if companies do not take actions, and there is no consequences and we are only educating. We will keep having those types of actions what I have seen the company does is they will not tolerate it is not what they say it is what they do. And I have seen it.
>> As a woman from the panel, I just want to echo both of our members definitely see it say it programs, with the in the organization is something that helps us a lot with this type of situation. And something that I have to say of course we know that the maritime industry is woman nominated dominated were we know that. But from my standpoint and being the first woman to head the Puerto Rican shipping Association. I have to say that the respect that we have seen with our members in the mentoring that we have been receiving, it is a respect that we seem to have across the board, and I am thankful for that I have to say again a woman within the maritime industry we have seen changes in that, so like the captain said, programs like to see it say it, we have different accommodations within the Puerto Rican shipping Association. And one of the things we discussed is how important it is continually open the doors for women. In this industry but most important the respect each of us need within an industry perspective so thank you.
>> From the Coast Guard perspective just as I will share the safety information bulletin with everybody here. We are also disseminating that through our safety committees, making sure each time we meet with industry partners, explaining what our expectations are. Sort of speak, we take those on our port state exams as well, and leave them to the master to make sure that

they understand what his expectations and what our expectations of the master are. We are disseminating, as much as we can. We are doing some case reviews and case study to figure out you know where, what the best practices are, and how we continue to improve on them.
>> We only have 3 minutes left.
>> I did want to come back and I did not want to divert from the topic of I want to respond to cosmos comments usually defined contours. I completely agree. That the future is in a data set provided to the user whether that be a mariner or someone else. And the user should have the ability to cut contours and display data at the way that is most fit for their purpose.
And the maritime community, as you know, we are somewhat constrained by needing to adhere to international standards for the products that we provide, and the current S-57 standard. The current generation of Ectus, do not support user-defined. The new S-100 standard and the new S-102 overlay, combined with the next generation of Ectus, does support that. It does not get to the point about th non-Ectus ships. That is a large user base. What I will say, in some respects, there is more possibility there with the electronic chart system. We saw a screenshot from Rose point as an example of one. I am not an expert on Coast Guard regulatory framework around it. I believe the Coast Guard has for some classes in Vincent's allow CCS to be used on the bridge in lieu of paper charts. So the advantage of ECS his they are responsive to user demands. It is similar to PDU manufacturers. So it can be much more guided. That said there is also performance standards for ECS, that are covered internationally, and we need to capture those regular shows up as well. That is not something that my office directly controls, but it is something that will we have a bit of information. So we have been in intent to continue to use that influence to try to get us to the vision that Cosmo played out.
>> Thank you Admiral. We have one last comment.
>> RCP wouldn't see Larry's comment from 20 years ago. It is a bit related to what you just said you commented about port of Rotterdam as well. That was a really interesting approach that was taken. The port basically took over and said, well the Netherlands said we cannot support what you want to do. But they were to go over the production of what the pilots need there. So, related to the saying that we need to be continually updating that as well. And within the constraints but being able to do that it is leading to that digital twin or digital view. But you need the data behind that. So in that case they are surveying weekly. And that is locally updated, so they get the feet of what is in the chart. The S100, and then they are also updating it. Tran three is a service of what is available from there, National water level, later sharding that they have to their service. It seems like the port themselves, and the technology there to allow them if it is weekly updated and provided to pilots and the technology is there and available. There is commercial applications we can gather all of that data in a port and service out to the pilots. It does not satisfy the compliance as Admiral Evan said. You are outside that compliance. But I think that is part of the future. It seems like there is a way to do that much more flexibly. But it does rely on data. It is not all there yet the idea is something still to come.
>> So interestingly enough, if you Google high density rhythmic data what comes up is a study that they did in Australia also and in New Zealand. And exactly what you are saying as a stakeholder driven basically to get better data for certain ports in those areas. And the issue that they discover, because it won't, it does not fit into the official mold. Yes absolutely the pilots use it they don't care if it is an official chart or not. What you end up is a pilot who has a different picture and the navigator has on his Ectus. that leads to a breakdown on the BRM. That needs to be together for it to be safe. I would just add port headland is where they use it.

When the pilot comes on board, part of the master pilot exchange is that discussion so the checklist there is a little different to when it is happening and how it is happening to keep the bridge management team save as to why the pilot is doing that. So I completely agree so there is that interface happening.
>> Thomas you have 30 seconds
>> Okay I will be quick Puerto Rico is an island, between 85 and 90% of the goods that we import, mentorships. And there is an over reliance on that. This is not to under a lump mind the rest of the islands port. We need to work to enhance the capabilities of other boys. My question stands from my experience. Again I want to bring my perspective as a professional mariner as a pilot. I was privileged to [Indiscernible]. We were able to use the ship as the perfect platform to carry out humanitarian missions. We not only went to the states to help Puerto Rico but we evacuated people from the U.S. Virgin Islands. And if you asked me as a Captain the first thing that comes to mind when the port is reopened is real-time data.
Of course we have [Indiscernible] and we do use that dashboard and that system daily. But for the first storm most of it isn't available. We can bring in the ship and radar without buoys, or GPS, if that were the case. However having wind speeds or currents is critical particularly with the vessel that is 1200 feet long. So my question is that is. Is there other assets or equipment that can be deployed after a natural disaster such as hurricanes here in Puerto Rico. That are available right after so we can kickstart the bay. Because opening the bay with the Coast Guard is making sure the channels are clear. Maneuvering of the vessels are avoiding another catastrophe while trying to help is concerning and important.
>> Thank you very much on that note I would like to take the opportunity to just this as a starting.this is at the end of the discussion. I am the contact for the island of San Juan, please use me, and I will carry the flag for you. And to answer your question Thomas, we do have deployable buoy systems that we can talk off-line that the co-op has. Thank you very much two of the panel members for your time and your insight. And thank you very much.
[APPLAUSE]
>> Thanks to the panel I feel like it could go on much longer with questions if we have the time. Captain Figueroa, I don't want you to leave here that you are being abandoned by the paper charge. You miss his presentation. There are people, I do not know if you will be here for a while, or through Nick. But there are people, that can give you some ideas about how to transition or what to do if you really don't have that system. He does not have the electronic capability on board.
>> Five minute break and then public comments. We are very structured with public comment, because people are dialing in. And so we do not want to take too long a break. We will come back in 5 minutes.
>> This is our last session, we have time constraints for noon time also.
>> All right next, Admiral Evans and Lynn. Who we are going to do a photo up here.
>> Okay Admiral Evans and Lynn will lead in the discussion for public comments.
>> Okay so this is the public comment period. I will ask Lynn to read any comments that we received, and then we will open the floor in the room for public comment.
>> So you guys yes, the challenges faced by genetic silence geodesy is a fundamental silence even we face a similar issue in Canada. It sounds like U.S. and grounding from Danny Haynes. The concept of digital and visual stayaway areas associated with bottom characterization on quote. On related to the drop of a specific ship, might be more relevant and: Tour

representation. Which will remain extremely useful for route planning and navigation assistance purposes. We would welcome comments in the room. So that was an exciting session, and you can direct comments to any of the members if you would like.
>> That is all the comments that have been received today so far.
>> Those are updated live, so if there are additional comments from people intentionally virtually we welcome them. You can also send a follow-up during the meeting time, so if you have if you get to comment you can send an invite tomorrow at five or 430 we be happy to accept that by 430 tomorrow as well okay going once going twice, if there is anymore online? Okay, we are going to continue on with the agenda.
>> All right, I think we have about an hour left here. So let's just kind of start up where we left of this morning. This might be a good time for you to go ahead.
>> Thank you, I feel like I've heard this a number of times now, from folks throughout the discussion. So I thought maybe we could put a pen and it. That is the discussion around small ports. The captain just mentioned it again as part of the panel. Earlier Lindsay talked about it. From the perspective of equity and inclusivity it feels like this is an important question. Nicole and I served on a different Federal advisory committee, that met earlier. In Alaska this last time. And there too, there was a discussion about small ports. It's no small ports that serve relatively speaking not many people, because the population density is so low. Yet, they are vital to the survival of the folks. So the Army Corps to go. They usually decision-making metrics might not enable them to prioritize these ports and the prioritize the underserved communities.
I am wondering at some point if we can think through that a little more, and wonder about if there can be changes and practices or metrics and decision-making rubrics that can help us serve these communities. There is a reason why there underserved, because they don't help them rise to the surface.
>> Thank you tuba, I will comments there were three meetings ago that we met in Anchorage, actually we had, it was before you were on May the, page was on. We had a really good session, it was a joint day with the Association in Alaska. And we had many speakers, that actually presented that they and talked about the challenges of a lot of these these villages that are in the Arctic basically. And they could not get fuel to shore. The ships could not get in. There were weather challenges, the draft challenges. Like what do we do? That is a very different situation than what you are up against Alex. It's still the same concepts that are these are the underserved areas.
>> I want to say I agree. This is a challenge that we see as you have noted, the rubric the criteria that we have used to prioritize traditionally survey work and chart updates. We have looked at things at like what is that 50 biggest sports reports that have the greatest volume by tonnage, or by dollar. And that doesn't adequately account for those ports that may be very small but are absolutely essential to the communities that they serve. We see that in Alaska, saw that and why last fall, and we see it here in the Caribbean. Where there is simply no other way, to get those goods into those communities. And the fact, that they are generally underserved, it is not just the charts. But the whole suite of services available to those communities. It perpetuates that status to some degree. We also, so I think we are thinking about so then the question is okay, understood, we have the challenge what do we do? And we have a we have transitioned, to a model what we are referring to our hydrographic health model. This is perhaps apropos. What the hydrographic health model intends to do, as we assess the health insufficiency of the hydrographic survey the bathymetric data in U.S. waters, it takes a more nuanced look on what

is not sufficient. Be on it looks at other factors it might guide us in terms of prioritizing survey work. The challenge is maintaining that. That was built out and updated, and I don't think we have the resources to take a second look at it and do a rerun of the bottles, and whether we have the right model in first place? You can correct me if I am wrong I think it is been several years since we have the resources to do that. So that is definitely on our to do list. In incorporating more of the societal factors into that. It would be part of that process. It is a matter of if we do that and what are we not going to do. I will also know, not only societal benefits in the man for servings underserved communities and ports. It is also kind of a will we don't see as much of the it is a poor resilience issue. So if, if the only ports I can accept the shipping or if they are increasingly concentrated what happens when one of those is taken out for some reason. If we have a grounding or a natural disaster, or you know world events right? That change the flow of shipping, if our poor infrastructure is not resilient and can load balance that flow we end up in the supply chain crisis and resolve that a year or so ago. I think the idea of how do we build out services to support smaller ports, relief ports, in addition to the underserved communities. It has application in that as well.
>> Admiral Evans, that is exactly the point that I was thinking of. As the ports get smaller our differences in navigation and coastal resilience come closer together. We have an opportunity I think, and some of these small underserved ports, to utilize and scratch the funding that may be available right now, to serve underserved communities in different ways. And also leverage some of these tools, that maybe are not getting the visibility that they need. So we were talking last night about a digital twin. And some of these technologies that really communities should be a bracing and adopting, but maybe they don't quite understand them? We should try to explore a little bit on how we can help underserved communities in the small ports and select one or two as the pilot in a demonstration where we can apply the tools to the communities and stakeholders, and really you know make a case there bring the navigation technology to bear on [Indiscernible].
>> Thanks Nicole we are going to come back to your comment in just a bit that is a great idea I don't know how NOAA feels about the feasibility and vetting these pilot projects. Because I know it is very tricky here. Okay, Mike has a comment.
>> Just to add on to the Admiral's comments. Some of the [Indiscernible] shoreline mapping side of things especially below the supplementals received over ten years we've averaged over delivered to can survey. To address small ports. Additionally we get a lot of import from charting divisions. And they are doing the re- scheming and they are coming across and doing their own evaluation using imagery of things and ports that need to be corrected. So we have to set up a pathway where they can put in these request for smaller areas of supply chains. And they can turn it around within two or three days I just wanted to add on. We are trying to keep up [Indiscernible]. Much like a challenge.
>> Thanks Mike. Okay, Alex and the small ports in Puerto Rico, that are not receiving the services. Is it kind of, I am wondering what would be helpful for you there? Like, are there specific things that could help out? Let's just, I know, you have nine ports or something. How many of those, are not actually, don't receive these services? Is that?
>> Is not that they don't receive the services. It is we need better information. For example weather. And currents. We have specific ports, where it is just one basin, maximum size ship, minimum clearance on the bottom. If we can have better weather understanding and real weather data and the when we can see but the current. Because they are very prone for

accidents knock on wood we have an excellent safety record. We have to improve safety record is because we have to take matters into our own hands.
For example, the weather buoys that are set up around the island. The weather stations in the use of PPU, they have become an excellent tool for navigation and safety. In my case, we don't want to step further. We are using the PP you, which are completely independent of the ship system. We don't have to plug in to get a GPS information or heading information or someone. So we went into that redundancy of improving the safety and navigation using independent PPU's. not through the transit but also through the docking worked on the bridge way. Most of these times freighters don't have the fancy equipment of The crews ships. Where you are on the bridge with all kinds of equipment. Over here, you have the whistle. That is it. So using the PPU, has brought us to the next level of safety. But if we can get better weather information, I know it is difficult to get soundings regularly. Even though, we have two critical ports [Indiscernible] for oil. And the one I mentioned Lost Moray is, we bring in coal for the power plants one of the big power plants for the island. They have a silting problem.
To give you an example, I had a grounding about 15 years ago. The result of the grounding was 815 million-dollar dredging project. We were silting so reference rapidly. The rate of silting was very fast. And those places there is no margin for error.
>> Does the Army Corps dredge any of these ports?
>> As I told you before, we have got for ports that are only federal ports. The other ones are not. So these are not. So they are owned by the Puerto Rico Port Authority. But unfortunately they were not able to come to this for these days. So, because the economic crisis, the port authority does not have the money. So they rely on the user to do the dredging.
>> Just to follow up on Captain Alex. And the question how many ports or stations do we have around here?
>> We don't have a ports system in Puerto Rico at all. We have the normal gauges and systems that we have everywhere. But we do not have a partnership to have ports around here.
>> Yes, so I will ports program has constraints operationally how it is set up. But as I was telling Nick, my brain is like a popcorn Popper. I've had a lot of ideas, and we have had a pleasure to spend a day with these folks. So both hearing on the pilot boat with them, or what their real needs and constraints are. And also from the shippers, the thing that is really, I think unique about Puerto Rico is, they turn around their supply really quickly. So they do not store stuff here. It is not bigger ships and more containers. It is speed and efficiency that the whole supply chain works. That really struck me, so a lot of other places were thinking bigger ships, they do not think that here. It is the agility in the ability to mix quickly. And I think it is supercritical, they have another deep draft report they can get into if something happened in San Juan. But I have a lot of ideas of other ways that we can support them if they are unable to join that formal ports partnership with comes with a big price tag and commitment.
>> You should correct me if I am wrong, the model that I know about ports is that, you handled the data management and display of data. But the locals that assess and to maintain those assets. So they still have to have the resources to buy their own current meters, and met station or whatever. I think they have been very active in supporting some of these weather requirements but the resources still have to be there.
>> Yes the resources have to be there and they will have a considerable problem looking for federal partner. Maybe one solution to that, would be some sort of grant program they can

apply to get dollars than they can used to acquire the assets of matching. So there might be ways to make that funding available creatively.
>> So just a question, you do contribute to the harbor fun over here right? When the ship is: That money getting into the harbor fun which then gets remitted to the federal government are no
>> No, no. There will go to the Puerto Rico Port Authority. No we do not have a federal harbor fun.
>> That's why they don't want to become a state.
>> Can we take the discussion back to the classes? Is it listed on the list here? About the outreach, you have really great opportunity to advocate with the [Indiscernible] sciences. In the weather versus going to the office. There is great technology we use surveyor now. And lie down on the throne. So any change of the practice a lot is very attractive.
That's what we need to do in these markets. Because most of them, when you talk about drones it is very exciting, but I don't think we do. It is all done by new technology that is what I just want to add.
>> Okay, we will make sure that we get the small ports topic in our discussion notes. And see, I am not, I don't know enough about these grants, with NOAA, the Army Corps, I do not know if you would have any more comments on this. Setting up a pilot project. An individual project how that would actually work. Do you have any comment?
>> I don't, like you, I am not sufficiently familiar to say anything intelligent at this point.
>> We will not let it die in the ditch. We will get it on of the notes, and maybe try to find out a little bit more. Do you have a comment about that? Behind you Nathan first, let me get to Chrissy.
>> I guess a comment or background, one of the things that he had been looking at is external -- back exploring the Port development program. You know that port infrastructure development program might have some of this flexible funding, but the onus is on the partner to apply for this, and kind of understand the implications. There are limits on the infrastructure you can purchase with these grant funds. I just want to remind folks that program exists, and is gotten quite a few plus ups in recent things.
>> Great so we will have to explore that. Does anybody else have any ideas we can get them down. Nathan?
>> Yeah, I mean, I don't have any answers. But the small harbor conversation small port conversation was very interesting prior to the meeting I was looking at some of the previous Arctic issue papers. And that was one of the exact topics in there. It was going back to several years prior to meeting in Alaska that we had several years ago. Talking about pilot projects, the last coastal mapping strategy came out, they led an effort to come up with a number of pilot projects that would support that effort. It was you know ideas that could be up there, I do not know if that is the probe that was a white paper that was put through. It could be taken for a pilot project [Indiscernible]. Harbors.
>> Ms. Sosa asked for this very thing, we need better resilience when he small harbor is to come online. And it is that type of foundry organization, her group, that can help a small underserved community will apply for a grant they don't have the resources to keep the lights on sometimes having the resources and so many of the things that we need here for congressional awareness. That the ships one more foot of draft of get an amen it can increase their bottom line. Going to Congress and saying we need precision of gays, we need this

because it is going to benefit our industry. I know that tran five cannot do that, perhaps we at HSRP, to empower them and let them know that we want this from you.
>> Julio you are in the back, you should stand up for a minute and get in on this conversation. I am quite sure the already connected partnerships with a lot of these agencies and these entities that are on the island. And so talking about getting further whether currents winds and waves, is that something creating characters partnerships does that fall with in your line there?
>> No, not working, I cannot hear you.
>> First I would like to point out something in response to the common that was presented here read guarding the [Indiscernible].
>> Come forward we cannot hear you.
>> This is Julio Morel, [Indiscernible]. I am responding to the comment. That the the data was not accessible after hurricane Maria. What happened was the cell network went down. We stayed up and it was unavailable, so the need for Internet would be [Indiscernible]. Regarding our connections to other entities here. We are striving to bring together in the island who are proficient and have the personnel and expertise to help out in a wide range of activities including restoration, and monitoring. Actually endorsing a proposal [Indiscernible] vessel Clarence. During vessel clearances and so on.
>> So you already have some things in the works as far as, I kind of miss what you said. Right under vessel clearance. You are already got a couple?
>> Yes we just signed an agreement, and we have been engaging with them a year. Trying to bring them all and, because there is a limit on the expertise on the island with the universities. So we are trying to tap into the resources that are available, they flourished after the hurricane. It was a product to hurricane because all of these funds came in. For the reconstruction. They were able to keep these people working in the island.
>> Okay, for the, well tomorrow we will have a presentation so you will see some of the in-depth work that they have actually done a year end the partnership that they have created. I think the discussion of making the small harbor more resilient and accessible, is definitely an border ship in partnership. Because it seems like that is right up your alley about what you are doing.
>> I think we will go over that tomorrow in the presentation. Some of them are very tough problems, one of them is [Indiscernible]. Because the coal ship, I went in with Captain Cruz. So the the hydrodynamics when you get there cannot be forecasted or observed it is a real challenge. Especially that area.
>> Thank you very much. All right other any other comments on this topic or any other topic that we want to talk about before lunch? We are actually a half-hour early, I know we would like to get out a half an hour early. Yes Gary?
>> To go back to the crisis, I know the survey is going to the meeting. And there will be a meeting of the un- surveyors network there. So that would be a good opportunity to ingest and get input from that group, on how we can do outreach. To attract individuals to this geospatial profession. I have asked if they're going to do that.
>> Okay.
>> Thanks yes, so we are very involved with the young surveys. Dr. Jacob Haack is one of our advisors to the youngsters in the network. And is looking to put them on to an event in Orlando in May. And they are also doing a big survey competition on the mall. So we get to have another

kind of engagement the National Mall in D.C. So we will have another chance to engage with them there. And I think that is a really good avenue.
One thing that I did want to bring up, that I forgot to mention last time. Is that one of the key pieces of the terms of talking about grants and grant money, is the National Science Foundation. And one of the things that I have been hearing repeatedly is not the National Science Foundation has been focused on applications of geodesy. So people do get money to do some of that work, then they go off and to other disciplines into geophysics and other places, so one opportunity is to encourage the National Science Foundation to sue directly support geodesy in their grants. You know, more, more direct than the applications.
>> So these geodesy comments Gary is what you will going to work on tonight a little bit and maybe bring Gail into it if you want. And let's get some bullets to gather tomorrow for the discussion. Nathan will lead the discussion in the new cochair here of planning and engaging. So Nathan is going to lead the discussion as far as our priorities matrix, and we miles or do geodesy too how about that? We will put it all in your left tomorrow. Lindsay?
>> A question so just to understand better what level sense and current meters are provided. And served with that data, I know there is a quality aspect that you have to address, and the Carico's data they sort of get served separately. Do they get accumulated somewhere? I think Alec and said around you because they don't have them they are on the portable pilot using the Carico's data right?
>> The Carico's data we use it on the phone. It is available to cell phones. Because they have a variance webpage also they have two applications, a boating application. It is actually made for small borders because it gives you coastal information like the predictive height of waves and currents and when. But the PPU and we use the k NOAA agency. And if we get sounding for it but outside information from cell phones like weather and so on. So we rely on telephones and cell phones for our data.
>> That depends on the portable PPU?
>> Yes, I am already on my second generation of PPU, but for the first one we are using they designed it for the Port of Long Beach. It was way ahead of time 12 years ago. You were able to get just weather data. You were able to see other they have all kinds of capabilities it just depends on how much money you want to spend.
>> Back to the initial part of the question, how the data from Carico's if there is not enough how does that get integrated together is a dumb by you or Carico's how does that work? How can it be presented to users [Indiscernible] both from the NOAA co-op in Carico's by that to the user.
>> I would say that is the more efficient pathway, the API smart people can inhale it easily. We cannot take on other people's data easily. Because of the meta data requirements and standards. I just want to put a marker, so the other office, Admiral Evans and I were regretting that we don't have a brain transplant with that office. It gets engage when bad things happen supports an office of restoration. So we have partnered with them and we built response buoys that they can use, and we have provided when they are dealing a grounded vessel, or a ship that is leaking oil, I think we should hear from them because I think you would be very impressed by this other part of NOAA, and what they do and there is a disaster. In the kind of support, they come to us for you know the currents and whenever. When they are dealing with you know an ongoing grounded ship that is leaking. That would be another thing that this group should be aware of the capabilities. I just cannot speak for them, and I am not that and that is unfortunate.

>> I think we may have came to the Miami meeting? That is all right it would be good for the people to have a talk does anyone else have anything that they want to, I can go around the room, just let me know. We are going to go ahead first of all does anyone else have anything? All right, Amber is going to make a few announcements, regarding this afternoon in logistics. So that way we are going to adjourn this meeting. And that will give us time to go to our rooms and get changed or do whatever you want and get our things together for this afternoon. And then we will all have lunch together and then we can all go to gather for the transportation for the harbor this afternoon. I just want to make sure no one has questions regarding any of the meeting materials or anything that we have done right now. Otherwise I am going to adjourn this meeting. All right meeting adjourned.