U.S. DEPARTMENT OF COMMERCE

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NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

(NOAA)

HYDROGRAPHIC SERVICES REVIEW PANEL

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PUBLIC MEETING

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TUESDAY,

MARCH 15, 2016

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The Hydrographic Services Review Panel met in the Sam Houston Ballroom, Tremont House Hotel, 2300 Ships Mechanic Row, Galveston, Texas, at 9:00 a.m., Scott Perkins, Chair, presiding.

MEMBERS PRESENT:

SCOTT R. PERKINS, HSRP Chair

WILLIAM HANSON, HSRP Vice Chair

DR. LARRY ATKINSON

DR. LAWSON W. BRIGHAM

LINDSAY GEE

KIM HALL

EDWARD J. KELLY

CAROL LOCKHART

DR. DAVID MAUNE

CAPTAIN ANNE MCINTYRE

JOYCE E. MILLER

CAPTAIN SALVATORE RASSELLO

EDWARD J. SAADE

SUSAN SHINGLEDECKER

GARY THOMPSON

NON-VOTING MEMBERS:

ANDY ARMSTRONG, Co-Director, NOAA/University of

New Hampshire Joint Hydrographic Center

JULIANA BLACKWELL, Director, NOAA/NGS

RICH EDWING, Director, CO-OPS, NOAA

STAFF PRESENT:

REAR ADMIRAL GERD F. GLANG, HSRP Designated

Federal Official

MIKE ASLAKSEN, NOS/NGS

GLENN BOLEDOVICH, NOAA/NOS

ALAN BUNN, NOAA Regional Navigation Manager

CAPTAIN RICK BRENNAN, NOS/OCS

GINA DAVENPORT, NOAA/NOS

CHRISTA JOHNSTON, NOAA

GARY MAGNUSON, NOAA/OCS

LAURA REAR MCLAUGHLIN, NOAA/CO-OPS

RACHEL MEDLEY, NOAA Customer Affairs Branch

LYNNE MERSFELDER-LEWIS, HSRP Coordinator

JOHN NYBERG, NOAA/OCS

RUSS PROCTOR, Chief, Navigation Services

Division, NOAA/OCS

DR. NEIL WESTON, NOAA/OCS

ALSO PRESENT:

DR. CRAIG BROWN, Galveston City Council

JED WEBB, District Director for Congressman

Randy Weber

CAPTAIN BRIAN PENOYER, Sector Commander, Port of

Houston/Galveston, U.S. Coast Guard

COLONEL RICHARD P. PANNELL, Commanding Officer,

USACE, Galveston District

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

Welcome and Introductions 4

Dr. Craig Brown, City Council Member,

City of Galveston, Texas 7

Jed Webb, District Director for

Congressman Randy Weber 23

Captain Brian Penoyer, Sector Commander,

Port of Houston/Galveston,

US Coast Guard 28

Colonel Richard P. Pannell, Commanding

Officer, USACE, Galveston District 43

HSRP Q&A with Panel 50

NOAA Leadership Remarks on HSRP Priorities

Dr. W. Russell Callender 58

National Ocean Service's Navigation Program Updates

Rich Edwing, CO-OPS 76

Juliana Blackwell, NGS 102

RDML Gerd F. Glang, OCS 125

HSRP Q&A with Panel 151

Panel - Navigation: Industry Demands and Future Developments

Neils A. Aalund, West Gulf Maritime

Association 164

Captain Sherri Hickman, Houston Pilots 224

Peter Simons, Port of Galveston 171

Brian Hill, MARAD Western Gulf Gateway 187

Captain Bill Diehl, Greater Houston Port

Bureau 203

Captain George Pontikos,

Odfjell USA Inc. 213

HSRP Q&A with Panel 226

Public Comment 246

Adjourn

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

(9:01 a.m.)

CHAIR PERKINS: Good morning. I'd like to call to order this meeting of the Hydrographic Services Review Panel. I'd like to welcome all of the public attendees and the new members of the Panel to our spring meeting for 2016. My thanks go to the Panel members and the staff for putting together a robust program. A special thanks goes to Neils Aalund and Gary Jeffress for moderating two of our thought-provoking Panel sessions. Our program also includes presentations from local and regional leaders of NOAA, further development of the Panel's issues and papers will take place during this meeting. We have much to discuss and a lot to do over the next three days. To get started with that, I'd like to recognize Rear Admiral Glang of NOAA's Office of Coast Survey. He serves as a designated federal official for the Hydrographic Services Review Panel. Admiral Glang, please provide any meeting details and logistics that we need from the public safety aspect.

RDML GLANG: Thank you, Mr. Chair. And my welcome to everyone here today. So just the logistics, the important stuff. There's an emergency exit right out behind me, and of course, you can bust out the windows on that side, or you can find your way down the hall, and the restrooms are actually right up at the top of the stairs here right outside our door. So that was the short on that. I do have one agenda change, Mr. Chair, if you're ready to look at the agenda.

CHAIR PERKINS: Certainly.

RDML GLANG: So, we have Mr. Craig Brown from the Galveston City Council, and he's double-booked, so I thought we could lead off with him, and then get back to our normal agenda. He's going to tell us all about the history of the City of Galveston as well. We had a request for that, so I'm laying that on everybody. So I'll leave that to you, Mr. Chair.

CHAIR PERKINS: Okay, great. I think we can accommodate that with no problem. One thing I do want to mention, though, is before we go further is thanking Admiral Glang for his many years of service. As you may have heard, those of you in the room, that Admiral Glang is ending his assignment with the Office of the Coast Survey after 33 years of active duty and dedicated service. Admiral Glang will retire before our next meeting of the HSRP, so this is our last public meeting with you, sir, so I want to take this time to both commend you on your service to NOAA and the country, and for your contributions to making this Panel work effectively while you served as the DFO.

More will be said about that later on in the meeting, and we'll highlight the Admiral's accomplishments. But simply said, it's been both a pleasure and an honor to work with you, sir, and we thank you for your service.

(Applause)

CHAIR PERKINS: We do have some new members on the Panel, we have five new incoming members, but in the sake of time, Admiral, would you like us to go straight into the presentations, circle back to the self-introductions afterwards?

RDML GLANG: Yes, I think if we could allow Mr. Brown to give us the welcome here for Galveston and then certainly invite him and encourage him to come back for the rest of the meeting. And then we can resume the introductions, because it's very important as well, we've got five new members. We have all of our members here, so that's pretty exciting.

CHAIR PERKINS: Very good. So with that, Mr. Brown, the floor is yours.

DR. BROWN: Thank you very much. I'm filling in for the Mayor this morning, he sends his apologies that he cannot be here. For those of you that know Mayor Yarbrough, you know he's much younger than I am, he's much better looking, but he has less hair than I do, so anyway, that's our differences that we have. I'd like to welcome you to Galveston here, and we're so excited to have your organization and have your meeting here held in Galveston.

This means a lot to Galveston. Galveston has a history with many of the functions that you perform, we work with NOAA very closely, and we have a history of working with the ocean and the beaches here that has been ongoing for many, many years. As most of you know, our Great Storm, we call it from a hurricane standpoint, was in 1900. It was probably still considered one of the most catastrophic from a loss of life standpoint incident in the history of the United States.

And after that, this island rebuilt itself. We raised this island eight feet, where this building is right here, this building, it was filled in, and the ground floor of this building was filled in to bring it eight feet higher than it was. Many of the homes on the island were raised eight feet. And also, with the raising of the island, we also built our seawall that you see out there. This still today is considered one of the most phenomenal engineering feats in the history of the United States is the raising of this island, and the building of the sea wall.

As we move forward today, we still have that affinity, we still have that love of the beaches, and our relationship with the ocean, and the relationship that we have with individuals with your expertise. Recently, Galveston has just finished a $6 million beach nourishment project on the west end of the island. We partnered with the Army Corps of Engineers with the General Land Office, and we set up a program for the first time for Galveston here of using the dredge material that has accumulated from the dredging of the ship channel to be deposited on our beaches. And we're looking forward to continuing that type of cycle in the future.

We also have coming up here, approximately a $20 million program where we will be re-nourishing or nourishing these beaches on the entire length of the seawall. This is a partnership, again, with Army Corps of Engineers and the General Land Office, the City of Galveston, and the Galveston Park Board. And as you can see, the beaches are vital to our economy, they're vital to our existence. Galveston has over 6 million visitors a year that come on this island. We're a population of approximately 49,000, have a police force, a litter control, sanitation department, and other types of departments that are geared for 49,000, but we manage 7 million or close to 7 million each year.

So those visitors, basically come down here to be by the ocean, to renew their spirit in the ocean, and to also visit these beaches. And so these beaches and the functions that are involved with maintaining these beaches are so vital to the City of Galveston.

Before I finish, I would be remiss in not bringing up Ike that happened in 2008. It was a disaster, a total disaster for this island. This building where we're sitting took about eight foot of water, seawater in this building here, and we are looking to the future, and hopefully the near future for some type of surge suppression system for this island. We know that it takes in also the ship channel, we know that it takes in Houston, but this is vital to our existence here.

As time has gone by, we're seeing the temperatures rise, we're seeing sea level rise, we're seeing the chance of hurricanes constantly during that season. And the constant concerns that we have with erosion. So because of that, we're looking to partner not only with the institutions that I've mentioned, but with individuals such as yourself, and with NOAA to maintain the quality of our beaches, and to maintain our existence here on Galveston.

I wanted to thank you again for being here. It's a pleasure to host you. If the City of Galveston can be of any assistance at all while you're here, please don't hesitate to call on us. And I'd like to leave you with one final thought, the CVB, the Convention Visitors Bureau wants me to tell you that we're a little different than other tourist destinations. If you go to Las Vegas, their motto is whatever happens in Vegas, stays in Vegas. Our motto here is whatever happens in Galveston, be sure to tell all your friends about it. Thank you very much.

(Applause)

CHAIR PERKINS: Well, thank you, Dr. Brown, for that historical perspective on Galveston and for the warm welcome. We thank you very much. And part of what HSRP does is we do travel regionally around the country to meet with stakeholders like yourself, and try to get that local perspective, so you've done a good job of encapsulating that for us, so thank you, sir.

DR. BROWN: You're welcome.

CHAIR PERKINS: Our next order of business, we do want to do self-introductions for the Panel members, and then follow that by the oath of office for the new Panel members. So with that, Susan, if you would go first, we'll work our way around the table.

MEMBER SHINGLEDECKER: I am Susan Shingledecker. I am vice president of BoatUS Foundation, BoatUS is the Boat Owners Association of the United States. We're the largest organization of recreational boaters in the U.S.

MEMBER MAUNE: I'm Dave Maune, I'm a retired Army colonel from the Corps of Engineers. I spent 30 years there, I'm now working for Dewberry where I am an elevation specialist, mapping with LIDAR, and SR, and photogrammetry the United States with the consent of the country, as opposed to my 30 years in the military where we mapped the Soviet Union without their knowledge and consent.

MEMBER LOCKHART: My name is Carol Lockhart, I'm with Geomatic Data Solutions out of San Diego, and we do LIDAR and multibeam mapping, and I'm a hydrographer.

MEMBER ATKINSON: My name is Larry Atkinson, and I'm from Old Dominion University in Norfolk, Virginia. I specialize on sea level rise and coastal flooding.

MR. EDWING: Good morning. I'm Richard Edwing, I'm the director of the Center for Operational Oceanographic Products and Services or the tides and currents folks.

MEMBER GEE: Good morning. Lindsay Gee, I'm an independent hydrographic consultant from Portsmouth, New Hampshire.

MEMBER SAADE: Good morning. My name's Ed Saade, I'm the president of Fugro USA and the head of the America Survey division, we're the largest offshore survey company in the world, and the largest offshore survey company in the U.S. We do a lot of work with various offices within NOAA, and really appreciate the opportunity to be part of the Panel. Thanks.

MR. ARMSTRONG: I'm Andy Armstrong, I am the NOAA co-director of the NOAA University of New Hampshire Joint Hydrographic Center in Durham, New Hampshire.

RDML GLANG: Good morning. I'm Admiral Gerd Glang, I'm the director for NOAA's Office of Coast Survey, and I am the designated federal official for this federal advisory committee. Welcome.

VICE CHAIR HANSON: Good morning. Bill Hanson, Great Lakes Dredge and Dock Company, the largest dredging company in the U.S. Also, congratulations to the Town of Galveston, and the Corps and the State for the beach job, which we were the contractor who had the privilege of doing the work, and so congratulations again, on what we know will be a continued success story. Also, as a native Texan, who spent a lot of time here in Galveston working actually for the Corps at the start of my career, I welcome you all here, I know you'll enjoy the town and enjoy the state.

CHAIR PERKINS: I'm Scott Perkins, I'm the director of federal programs of Surveying and Mapping. We're the largest land based survey company in the U.S., and have the pleasure of working for a variety of federal agencies. So it's a pleasure to be here.

DR. CALLENDER: Good morning. I'm Russell Callender. I'm the Assistant Administrator of NOAA's Ocean Service, that's just a bureaucratic term of saying I'm the director of NOAA's Ocean Service. So the navigation services portfolio that you'll hear about today from Coast Survey, Center for Operational Oceanographic Products and Services, and National Geodetic Survey is within the Ocean Service.

MEMBER MCINTIRE: Good morning, Anne McIntyre, I'm a maritime pilot from the Columbia River, been a pilot now for about 20 years, and prior to that worked for Chevron on oil tankers, and I'm excited to be here and hope that I can lend a bit of practical expertise to how the NOAA products are used.

MR. THOMPSON: Good morning. My name's Gary Thompson, I lead the North Carolina Geodetic Survey, I'm also part of the North Carolina Emergency Management Risk Management section, and I'm a professional land surveyor.

MEMBER HALL: Hi, I'm Kim Hall, I'm the Director for Operational and Security Technical and Regulatory Affairs, that's a mouthful, at the Cruise Lines International Association. And we are the largest cruise association internationally for one-upping one another. Thanks.

MS. BLACKWELL: Good morning, I'm Juliana Blackwell, the director of NOAA's National Geodetic Survey.

MEMBER BRIGHAM: Good morning, I'm Lawson Brigham, I'm a professor at the University of Alaskan Fairbanks, I'm a retired Coast Guard officer, I specialize in polar policy and operations.

MEMBER MILLER: I'm Joyce Miller, I'm semi-retired, I'm a professional hydrographer as well. And I pretty much spent my entire career in multibeam mapping. At the last few years, I was director of Seafloor Data Services for University of Hawaii.

MEMBER KELLY: Good morning. My name is Ed Kelly, I'm the executive director of the Maritime Association of the Port of New York and New Jersey representing the interests of about 560 corporate and individual members who are very users of all navigational products and represent commercial maritime activity.

MEMBER RASSELLO: Good morning. I am Captain Rassello from Carnival Cruise Line, director of nautical management. I take care of the cruise ships, port assessment, waterways, and try to get the best out of the business.

CHAIR PERKINS: Great. I would like to point out that we are fortunate to have two emeritus members from the Hydrographic Services Review Panel here in attendance this morning as well. We have Mr. Jeff Carothers from Fugro Horizons, and then we have Dr. Gary Jeffress from Texas A&M Corpus Christi. So I put that challenge to each of you as members, you know, we've been very fortunate that we quite often have past HSRP Panel members in attendance during our meetings, so I hope to see that continue. Oh, and Jon Dasler as well. I didn't see Jon walk in, good morning, Jon. Thank you. I need a rearview mirror.

With that, our next function here is to do the oath of office for the incoming members so we can get them in place, get them sworn in, and have you officially participate here forward.

RDML GLANG: So we have five new members that are in various stages of on-boarding, and officially today, we will welcome and invite to take the oath for Kim Hall and Ed Saade.

(Oath of Office taken by Members Hall and Saade)

RDML GLANG: Thank you, Dr. Callender. Gerd Glang speaking. I would like to introduce some of our staff as well from NOAA who are participating, and invite the Panel members to feel free to engage with them if you have questions or background, anything that you might need. Not all the expertise sits here at the table, for sure. So most of you have met Lynne Mersfelder, and she is the dynamo that's behind the organization of this meeting. Sitting next to her is my alternate DFO, Russell Proctor, who is the chief of our Navigation Services division for Office of Coast Survey, he's my alternate DFO as well in case I should fall over, drink too much, or whatever. And then at the table behind them in the middle is Dr. Neil Weston, and he's the acting chief for the Coast Survey Development Lab, he's graciously agreed to that detail, he's spent most of his career with the National Geodetic Survey.

And then next to Neil, on his left is Gary Magnuson, he's Coast Survey staff, and Gary has worked closely with session panel moderators to get them up to speed, and I use Gary when I need tact and diplomacy in speaking with people. And next to Gary is Christa Johnston, she's in our Office of Policy, at NOS, her boss is Glen Boldevich, who you met this morning. So Christa is sort of my immediate connection to NOS on policy matters. And then sitting behind me going from the brick wall is John Nyburg, he's the chief of the Marine Charting Division in Coast Survey. Mike Aslaksen is the chief of the Remote Sensing Division in the National Geodetic Survey.

Captain Rick Brennan is normally otherwise the chief of the Coast Survey Development Lab, he's currently on staff with Vice Admiral Manson Brown, and Admiral Brown would normally be here, but he's at least double or triple-booked, and many of the Panel members had an opportunity to meet the vice admiral back in September.

And then Glen Boldevich you've met. Sitting first row back here waving his hand, that's Alan Bunn, he's our regional navigation manager and he's based right here in Galveston. So he's are local knowledge, and he'll tell us more about the history of Galveston.

And then, I want to point out Laura Rear McLaughlin. She's a staff for CO-OPS for Rich Edwing, our Tides and Currents program. And then Rachel Medley is Alan's boss, so she's sitting behind Alan to keep an eye on him. Rachel is the chief of our Costumer Affairs Branch. And then in the way back, we have Gina Davenport, she's special assistant to Dr. Callender. Who am I missing from NOAA? So I wanted to introduce my NOAA team both to our non-Panel members, our public guests participating, if you have questions about the program, but also to the Panel members. And then we'll have a few other folks from the program who will join us, or at least one other person, Ashley Chappell, I think, tomorrow.

So I just wanted to point that out. I bring my staff not only so that they can hear from the stakeholders and from you all what's going on, kind of calibrate them as we live inside the bubble inside the Beltway. But also, to invite you to ask them questions about the program, and to learn more. So thank you, Mr. Chair for that.

CHAIR PERKINS: Excellent. Thank you, Admiral, for bringing the staff and facilitating that. So now, we'll move on into the Panel discussion. Our first speaker this morning is Mr. Jed Webb, he's the district director for Congressman Randy Weber of Texas' 14th District. As Congress is session, Congressman Weber is actually back in Washington D.C. in his office on the Hill today, I suspect in representing the citizens of Texas. So we're very pleased that Mr. Webb can be here in his place. So, good morning, Jed. Jed has the challenging position as he oversees all three district offices for the congressman and serving as a main staff person on the ground to meet with constituents in the district on their interests on a daily basis.

Mr. Webb is also a U.S. military veteran, and has served on the ammo team, chief in the National Army Guard. So thank you, sir, and good morning.

MR. WEBB: Good morning to everybody, and welcome to beautiful Galveston. If you get a chance, I encourage you to walk up and down The Strand, beautiful place, historic, and spend some money if you can, we'd appreciate that, too. To start off, Galveston has a long history of centuries of being on the Gulf and being a very highly used port. And just to give you an idea broadly of our congressional district, we started the Louisiana border, that foreign country, and then go all the way down to Freeport in southern Brazoria County. So we have about a third of Texas Gulf Coast.

And something interesting and special about our congressional district is we have the most ports of any congressional district, we have five. We have Port of Beaumont, Port Arthur, Galveston, Texas City, and Freeport. And we are lots and lots of growth, good times, working hard hopefully to encourage that to happen. But because of that, we live here, we work here, and we play here. And so very, very busy ports, which we're happy about, and we want to keep them even more busy. And very busy waterways as well.

So not only is it industrial use, but it's also cruise ships coming in and out, and then lots of fishermen going offshore to catch fish as well. So that's something that's very unique about our district with just the vast amount of growth in there.

So I was talking to the boss, we were driving, lots of windshield time with him, to a meeting last Friday. And I said hey, what do you want to talk about? What do you want me to bring up? And the biggest, I'd say, frustration or the biggest challenge -- and I'll get into the weeds a little bit -- is with the appropriations process or the difficulties. Before in the days of earmarks, if there were projects or areas that were regionally important, we could get those things fast, and I think people got used to that. However, with that, we ended up with many bridges to nowhere, and lots of different problems. But now because of that, and because we've pulled back, and changed the way we do things up in Congress, there are things like a city council member, and if you talk to any person around here, they will talk about Hurricane Ike, and they'll talk about coastal barrier protection.

And it is of utmost frustration that something that is vital to our community, to the viability, and the existence, and the growth in this area, it is incredibly difficult to get something that makes lots of sense, we'll save billions and billions of dollars, but because of the way the system's set up, if it's not in the President's budget, and even more difficult, if it's not in line with what the appropriators want, those things get pushed off to the wayside.

So one thing I would encourage the Panel to think about and then make sure is that there's regional needs that are out there. And they'll get smacked down by the appropriators at first glance if they aren't multifaceted, touch different areas, even though this is the lifeblood and the home of petrochemical industry across, you know, probably the biggest in the world, in our opinion, there's not much that's outside of Texas. But that's something that is keenly -- the congressman is concerned about. He has conversations probably every week with members of Congress, especially appropriators, making sure that they understand the importance of that. And so that's something that he wanted to highlight that.

And we have something, there's a Texas Coastal Study that's going along the lines to make sure we're studying the coast, but then someday we're going to have to pay for this project, and it will be quite expensive, and I'm sure we're looking at multifaceted areas. But I just wanted to, first off, welcome everybody to Galveston, and then talk about that. So, thank you.

CHAIR PERKINS: Thank you, sir. Next on the Panel, we're delighted to have with us this morning Captain Penoyer from the U.S. Coast Guard. The captain directs all of the U.S. Coast Guard's missions in eastern Texas and western Louisiana, including seven major port areas, including the Port of Houston/Galveston. He has many responsibilities in carrying out his duties including serving as the captain of the port, overseeing the Marine inspections, being the coordinator for federal maritime security in this region.

His full bio is in your briefing books, but some of the highlights of his career include serving as the admiral of Thad Allen's liaison during the Deepwater Horizon incident. Being in charge of U.S. Coast Guard operations for the Chesapeake Bay, and being the chief of operations and planning for the Port of Jacksonville, Florida. It's a very impressive career and we are honored and pleased to have you with us, sir.

CAPT. PENOYER: Well, thank you for having me, I really appreciate it. It's a great honor to be here and to speak with you. And as so often happens, I feel like I'm addressing a room full of my friends, so many of you that I've seen over the years, and it's a pleasure to be here with you all.

I guess I'm going to begin just by saying a couple of themes for what I'm going to talk about, I didn't bring any pictures for you to look at, I wish I had, I could've put the Texas Chicken up here for you to see while we were talking, then you wouldn't have remembered anything I said. But the themes that I'd like you to kind of hold in your mind as I run through it, just a couple of brief introductory remarks and hand it over to my good friend Colonel Pannell here. I'm going to start with -- and I'm talking to hydrographers in general, you'll appreciate my theme of the difference between data, information, knowledge, and wisdom. And I'll touch on that cascade as I speak a little bit because I want you to also bear in mind as we speak, I'd like to put front and center on nonhydrological front, a piece of information that may lead to your knowledge as you put your field of study and your activities into a broader context.

And that is that the maritime industry, really the world, is in the midst of a SCADA revolution. SCADA is an acronym essentially referring to any number of ways you might prefer to refer to it, big data, ubiquitous sensors, and digitization of data that we never had before. Along with and married to the ability to both share that data and use it to control processes and activities that were never automated in the past.

That revolution is just beginning to crest, and the maritime domain, maritime activities are completely embraced within it. So I ask you to put that on your map as we talk a little bit here today. And I'm going to begin by saying that the Coast Guard, you've heard all of my ubiquitous titles that they give me, and they all end in the word coordinator. The Coast Guard is, at its heart, as is NOAA, a maritime governance force. We are certainly at all times a military service, we've been present in every combatant theater, that is part of our identity. The old story goes that Ronald Reagan, being briefed on a Coast Guard was at, you know, essentially, his one question was why do I need two navies again? And the answer is you don't. You need a combatant force that provides and is engaged in maritime governance, and that's the Navy. They exist to fight and win the nation's wars, and to project force.

But you also need a maritime governance force that engages in combat when needed. And that's your United States Coast Guard. I say that as an entree to say that maritime governance is far bigger than any one Service. We're very proud of all the ways that we are engaged in maritime governance, but the truth of the matter is anyone here in the port will tell you, and frequently members in the port talk about the four corners. And the four corners are this gentleman to my right, Colonel Rich Pannell and the Army Corps of Engineers. My brother in the Customs and Border Protection, who does all of the port commerce control. Office of Field Operations, me, and NOAA. Those are the four corners of maritime governance, and all four corners have to be engaged if you want to get anything done.

I applaud you guys for thinking that way because I can't tell you, I wouldn't presume to tell this Panel anything about hydrography and the services that NOAA provides. I wouldn't pretend to advise you there. But I will put those services in a large context, and let me give you that context up front. When I came down to Sector Houston/Galveston, much similar to Congressman Weber's district, I looked at the geography of this Coast Guard division, geographic division. And it ranges from about midway through the Matagorda Bay, just south of Freeport, all the way over to just east of Lake Charles, Louisiana.

And as a career Coast Guardsman, I thought well, some lunatic designed this sector. It spans two states; that gives me two governors, four senators, and countless other divisions. All the other federal agencies are generally orbiting around federal circuit districts, and this spans a couple of them. So I thought this is nuts, somebody should've obviously drawn the line at the state boundary line, Sabine River's a nice mark for that purpose, and in effect, Colonel Pannell and many others have that.

About six weeks into the job, I discovered that whoever designed this sector was a genius. And it took a while for me to realize the inherent genius of it. And I'll tell you why, it originates with the nature of the industry. We talk about seven regional ports here, and what I would tell you to reemphasize what Mr. Webb said, it's important to recognize that this region, not just the maritime ports, this region is a port complex, an industrial manufacturing complex with particular emphasis on chemical manufacturing, although, refineries commonly grab everyone's attention.

And so what I frequently find myself doing whenever I speak to any group to talk about this region, I have to make that point because it's not simply a maritime thing, it's an intermodal thing, but I have to distinguish whatever you think a port is from the seven that are under my jurisdiction. Because when I say the word seaport to you, you're probably thinking of Los Angeles. You're imagining a giant conveyer belt that goes to some part of Asia, probably China, in which loaded boxes are coming in at a furious rate, they barely touch ground, and success in that port is measured in seconds of cargo rest time before it's onto a chassis, a railcar, and is onto its ultimate trans-shipment and end destination.

And similarly, you're thinking of Los Angeles as a collection of empty boxes getting on the conveyer belt to be taken west for reloading. Whatever that model is, this port region is the exact opposite. The only analogy I've ever found that holds any sway in trying to describe it is it's kind of like a hurricane. It's absolutely true that these seven ports certainly import things, and they certainly export things, and those things matter.

In fact, the net balance trade is positive here. If the rest of the country would get with the program, we'd be all set. So as an export leader, we're very proud of that little local fact. There's a little artificiality as they say, numbers lie, and liars use numbers. But regardless of how you measure it, the fact of the matter is that the energy of this port can't be measured in terms of what gets sucked in the bottom and spit out the top, like a hurricane, the energy is in the swirl of commodity movement.

And that commodity movement within the seven port complexes is not simply by maritime, although, it is tremendously maritime dependent. It's also by pipeline, rail, truck. If there's a way to move commodities, it's done here. And it's done here because the entire region works on a single principle, the principle that there must be no wasted molecule.

So what that means in practice is, one man's byproduct is the next man's feedstock, and because of that happy coincidence of temperature, energy availability, resource feedstocks, if you make something that needs that byproduct, you probably relocate it here, and we have seen nothing but an unprecedented growth in chemical and petrochemical manufacturing. That's already baked into the cake, and if you think that this region or any part of this region is dependent wholly upon the price of crude oil, you've missed movement. Because that petrochemical manufacturing complex is about a lot more than that. And those investments, which I stopped counting after 150 billion of realized investment in manufacturing complexes, most of which is nonmaritime, but will ultimately have a maritime impact.

That is now reaching its crescendo, and by 2017, you will see the manifest effect of that. There's a reason that every global chemical manufacturer has increased or brought its footprint here. I say that to you because just to dial it down to a maritime picture, the Galveston Bay is one the most intensely used waterways in the country, every day it's 60 to 70 deep draft transits on the Houston Ship Channel, which for the record is 530 feet wide.

As Rich will tell you, it was created by the same act of Congress that created the Panama Canal, but they're perhaps, a little bit more modernized at this point than we are. Although, we're pretty proud of our little ship channel. The result of that is I have another 450 to 550 tug and barge combination transits per day through the Vessel Traffic Service area. This is the hurricane effect that I'm talking about. Many of those transits are not going further up the coast than the seven regional ports that we're talking about.

And that in turn leads to the fairways, the oil exploration, development, and production in the Gulf of Mexico, and I would encourage you to think of the offshore here as completely different than any offshore perhaps that you might find anywhere else in the country. Certainly, it was a shock to me to learn how heavily occupied it is. My offshore, I like to say, my colleagues and the other 30-some odd Coast Guard sectors actually have a shoreline that means something.

My offshore zone of responsibility goes out to the Mexico boundary line, 200 and change miles offshore, and it's densely occupied, almost to the borderline. So where they have a line that they call the coast, I have an occupied territory. And in that occupied territory, I have a lot of governance business to do, we all do. To that, I would draw your attention to the fact that water depth matters, right? And where the nearest 50-foot depth in the Gulf of Mexico is a subject that all of us talk about a lot, and what the implications are for both getting there, and maintaining our access to that water.

Some of that is, frankly, commercial efficiency, some of it is safety related as well. I would close by saying that essentially, I began with this idea of how important NOAA is to us. And certainly, I have to tip my hat to Mr. Alan Bunn, and the crowd down here, they are an integral part of the Army Corps of Engineers-led Navigation and Restoration Team. I could not do business following any kind of natural disaster or manmade incident without them. Those services are simply vital to us.

But that would be to neglect the things that go on, on a day to day basis in real-time data acquisition. Real-time mariner information. I was pleased to see the presiding officer, the Texas City/Galveston Pilots here, and they would tell you, I believe, how important real-time data is. The NOAA PORTS system, and the hydrological services that we're getting in real-time could not be more important to my Vessel Traffic Service, but that pales in comparison to how important they are to mariners, to pilots.

And in specific, I guess what I would say to you is I'll come back to my opening theme, of the definition of information, and data, and knowledge. I think the challenge we all face now is, I think, Mr. Webb laid it out, there are challenges with the idea that you're going to build a tremendous new infrastructure to just continue to increase traffic, and depth, and all of that.

So it becomes vitally important on this 530-foot wide channel that we be efficient and safe. The Coast Guard is endlessly talking about the future of waterways, and particularly, the future of eNavigation, but I think that misses the point. Those are small data points in the question of this data or SCADA revolution that we're experiencing. And I would encourage you to consider the velocity and volume of traffic that we're discussing, and to contemplate the difference between providing data, and integrating that into knowledge that a mariner needs in real-time to make decisions.

And to highlight that, I'll point back at myself. My Vessel Traffic Service director, Steven Nerheim is here today, and will be with you for quite a while. But we run essentially a traffic management watch center 24 hours a day, which does many things, but effectively meters out the entry and exit into the waterway to make sure that there is a margin of safety. We need to do so because of the size of the ships, and the challenges that navigation presents, even to master mariners, and the pilots truly are artists in doing this.

That system, in some ways, it's the state-of-the-art, it's the best there is anywhere in the country, no question. In other ways, it's almost the diametric opposite of what Google does for you today when you came on the road. And you opened up your cell phone, and you self-synchronized to real-time knowledge of what was going on, on the roadways around you. Nobody at Google headquarters dispatched you, told you when it was safe to enter the highway. They also didn't throw 1,000 little moving dots onto a map that you had to distinguish as data points from information, or from knowledge about how to get where you needed to be.

I would say that in this environment that I've just outlined for you, our greatest challenge is to get ahead of and figure out what that revolution, that SCADA data revolution means for us. For all of us in maintaining the safety and navigation of this incredibly vital region to the country.

With that, I'm going to shut up and turn this over to Rich.

CHAIR PERKINS: Thank you, Captain. The last speaker on the panel this morning is Colonel Richard Pannell, the commanding officer of the U.S. Army Corps Galveston District. The Colonel has a vast challenge in front of him with over 50,000 square miles that cover the entire Texas coast. The Colonel's full bio is in your meeting books, in your briefing book. We look forward to hearing more about the Army Corps of Engineers regarding the work, and the management of the Gulf and the Intracoastal Waterway, and the ship channels in the district's ports. So with that, Colonel, I give you the microphone.

COL. PANNELL: All right, thank you very much. I may be having a few difficulties technically here. So I may need a little help.

All right, great. Well, I'm very pleased to be here today and really appreciate the invitation to talk to you this morning. Before I get started, I wanted to just highlight some of the folks that are here today with me from the Corps of Engineers. And in the back, we've got Mr. Joe Hrametz, he's my chief of operations, and then we also have Mr. Chris Frabotta, he's our chief of navigation and he'll be on the Panel tomorrow as well. And then on a personal note, I've got my daughter, Emma Pannell, she's a sophomore at the University of Texas at Austin, and also with the ROTC program there. So she's taking some busy time out of her busy spring break schedule to join us this morning.

Well, I'm very pleased to be amongst so many friends and partners today, this is just great to see everyone here and to be able to discuss some of these issues and concerns, and ideas, and look for ways that we can continue to partner more. Clearly, NOAA's efforts are foundational and critical to the success of our mission and the Corps of Engineers. And I wanted to highlight some of that.

For those not too familiar with the Corps of Engineers, the Corps of Engineers is responsible for engineering solutions that strengthen national security, that energize our economy, but also reduce risks from natural disasters and protect people, property, infrastructure, and of course, natural resources. And what's a little bit different for our agency is that we're really an executing agency and we're responsible for the full life cycle of projects from study design, to building it to ultimately maintaining that.

And in Texas, we support what I called a shared vision for the Texas coast, and that's what you see there on the top right in blue. And looking at the Texas coast from the perspective of a region that is protected, that's resilient, that the conditions are set for sustainable economic development. But also, that we support all of the other investment that's out there with our other partners, state and local partners, as well as industry and other stakeholders.

So if you look at the type of investment that's going on in coastal Texas, our numbers have it in excess of $200 billion of non-federal investment. And so we're a federal agency that's trying to keep pace with that investment to ensure that our infrastructure supports that in the best way possible.

We have a portfolio of projects that support a variety of these sorts of activities. And on the left there, in the lower left, you see some of our projects related to the navigation mission. And we're really focused on improving navigation infrastructure, as well as maintaining the existing navigation structure that we have.

Our area of responsibility goes from the Mexican border to the Louisiana border, essentially, and about 100 miles inland. But clearly, the focus is on that thin veneer along the coast. We have six major deep draft navigation systems, three of which were already discussed, but there's also three additional ones further south. And if you add up the tonnage that these deep draft systems support, as well as the Gulf Intracoastal Waterway that links them all, you're talking about nearly a quarter of all waterborne tonnage in the nation is in this region. That's the scale of the type of maritime activity.

When I look outside of my window over at the east end of the island, I look over the busiest intersection of maritime traffic in the Western Hemisphere with the entrance of the Houston Ship Channel, the Texas City Y, the entrance to the Galveston Ship Channel, and crossing of the Gulf Intracoastal Waterway. So clearly, an area that Captain Penoyer is very familiar with and very concerned about on a daily basis.

In addition to our navigation mission, we also have a portfolio of projects that supports the resiliency of the coast, and supports protection of people, infrastructure, and resources. And so you can see some of those projects there that support flood risk management, but also that support ecosystem, and environmental restoration to make the coast more resilient.

We are extremely fortunate, and right now, we have two of the largest studies in the entire Corps of Engineer portfolio going on in this region specifically. One is the improvement of the Houston Ship Channel system, the other is what's referred to as Coastal Texas that Mr. Webb mentioned. These two studies are so large it required a waiver through a congressional process to get enough money to fund them. And we were fortunate last November to receive that waiver.

So we've got essentially two studies worth about $30 million that we're going to be working on over the course of the next five years. This is an opportunity that only occurs once in a generation, if not less than that. So we're very pleased to be focusing our efforts on these studies to support the development that's occurring in Coastal Texas. But again, this is impossible without the support of all of our partners, and that's no different than our partnership with NOAA.

We're very excited about some of the partnerships that we have. Up front there, you see our TCOON partnership. This is a partnership that we've been a part of for many years. We've had some challenges in the past, but we're pleased to be moving forward on that partnership right now, and really appreciate the support from NOAA to move forward on that.

The information that we get from that is foundational to our entire life cycle of projects from study and design, through the construction, and ultimately, the maintenance of that, and I know Chris is going to talk more about that tomorrow during the panel session.

But it's not just about that network, it's also about some of the other information that we generate and share with NOAA, and the information that NOAA generates and shares with us. And it is critical for some of the basic things that we do on a routine day, whether it's surveying channels for dredging contracts, it's for gathering information that's going to be used for a design, it's providing channel updates for improvements that we've made to the channels. Those are all key things that we partner with NOAA and our other agencies and partners on.

So I just wanted to mention that up front, for this is foundational, that's why we want to ensure that our efforts are synchronized with the stakeholders in this room, and so whatever we can do to support that, we are eager to do that.

So I look forward to the rest of this public forum, and I look forward to the discussions over the next three days. Thank you very much.

CHAIR PERKINS: Great. Thank you, Colonel. Just a point of order, you know, this is a public meeting. We do have a court reporter, so as we go into the question-and-answer session, please turn your microphone on, introduce yourself, that will assist the court reporter with capturing who is speaking during the Q&A. So with that, it's now the Panel's opportunity for Q&A.

VICE CHAIR HANSON: Well, I'm always good for at least one. Actually, Mr. Webb, I would just like congratulate Congressman Weber for his support of the coast. I know he's been very quick to attend meetings when he can, and he's very outspoken in support of his ports, and also his coastal activities. So just please pass along our gratitude for that.

MR. WEBB: I'll do that, and I guarantee he'd rather be down here.

RDML GLANG: Thank you, Mr. Chair. Gerd Glang, DFO. In the last presentation from the Colonel, he mentioned TCOON, and I'm wondering if maybe we can ask Rich Edwing to just recap TCOON, and compare and contrast it with what the Panel has learned about other regional associations. If you can do that in a real quick thumbnail, Rich, that would be useful, I think.

MR. EDWING: Sure. And I was going to cover this a little bit in the presentation, but I'll do it now. So TCOON, it's actually a long-standing partnership, the origins of the network go back 20-25 years. Started off as a smaller network to address some property boundary issues, but has expanded since then to really address all the water level needs along the coast.

I think it's fairly unique around the U.S., it's the largest regional network of water level stations to NOAA's standards that are -- I think it's about 30 stations, TCOON stations that supplement that seven NWLON stations that I operate in the area. It's a great partnership because you've got the state, academia, the Corps, and a couple of federal agencies involved.

And really, it's a network of stations that are using the same equipment; they're following the same standards, so they're interchangeable with our stations. And all that data can be used for supporting hydrography or coastal resilience, all of those applications.

another thing that I'm pretty pleased with is after Hurricane Rita and Katrina, we got funding to design and install for what we call the Sentinels of the Coast, the hurricane hardened tide stations, 4-foot diameter steel pilings driven 80 to 100 feet in the bottom, sticking 30 feet up in the air. And now there's six more off the coast of Texas, there's two that were established after Ike and Gustav, and then there's four more, more recently established and actually still to be completed with the equipment. So I think it's really a model for maybe how things should work in some areas where people -- everybody needs water levels, people pool resources to establish a network that takes care of all the local needs, and it's also by integrating the NWLON meeting nationally as well.

CHAIR PERKINS: Carol?

MEMBER LOCKHART: Carol Lockhart. I guess, just a follow-up to that from a user perspective, if I want to go and use a TCOON tide station, do I go to the NOAA website? Do I go to a TCOON website? How do I get access to that data?

MR. EDWING: So, because the data was to our standards, we display the data also. And there was a TCOON site, but there's been some transitions going on, which I'll talk about in a little bit. So right now, there's not a TCOON website.

MEMBER LOCKHART: Okay.

MR. EDWING: But there had been.

MEMBER MILLER: Joyce Miller. A question for Captain Penoyer. You mentioned the PORTS system. We've seen in many areas of the country that the PORTS systems are funded differently from port to port, which becomes quite challenging in some cases. Can you give an idea of how this PORTS System is funded and organized?

CAPT. PEYONER: Sure. So, every way under the sun is the answer. My seven regional ports are all completely differently configured, ranging probably from the most traditional model to the least traditional. So the Port of Texas City, for instance, is essentially a single-owner port, similar to what you might see in a Los Angeles/Long Beach.

Whereas the Port of Texas is sort of the middle of the -- Port of Houston, is a little bit of the middle of the spectrum, it has a locally sponsored Port of Houston Authority, which actually only operates eight of my 160 terminals. So most of the terminals are private sector terminals, with the Port of Houston Authority acting as the local sponsor for the channel, and providing therefore, some port services throughout fireboats, and so on. All the way through, essentially, no federal sponsor.

Over in Sabine you have the navigation district, which operates no terminals, does none of that sort of work. So every configuration under the sun. And in this regard, one of the things I'm fond of saying is that it's a little bit like the New York Stock Exchange, you don't really want to know how the price of commodities gets set. Magic happens inside those walls. And I attribute it, maybe rightly or wrongly, actually to the navigation configurations here.

Sabine River, the Houston Ship Channel, are sufficiently long and narrow that all entities on those ship channels recognize that if anything happens to one of us, it happens to all of us. So there's a, I'm going to say geographically-driven collaboration here, which is different from other places that I've been in the country. So, it is not a matter of the governance structure; it's a matter of the geography, in my opinion.

MEMBER MILLER: And how is the funding provided? By all of those entities? For the NOAA PORTS system.

CAPT. PEYONER: I actually can't answer that one. I'm not really prepared to talk to --

MR. EDWING: So, the Port of Houston, the Port Authority funds the Houston/Galveston Ports?

CAPT. PEYONER: Yeah, for the Galveston Bay. In fact, the Port of Houston Authority provides several services which extend all the way out to the Galveston jetties, and this is one of them, certainly. Fireboats are another.

CHAIR PERKINS: We're at 10:02 and I have had trouble maintaining schedule at these meetings previously. So I just ask that everybody be -- you know, we'll try to wrap this up and not get too far off track too early in the morning. So, Andy?

MR. ARMSTRONG: Thank you, Mr. Chairman. Captain Peyoner again, you mentioned in your talk the importance of the nearest 50-foot water depth. Could you elaborate on that a little bit? Thank you.

CAPT. PEYONER: Yeah, I'm really outside of my lane talking about economic loading of ships, but I'm enough informed to be dangerous. And, essentially, what that has to do with is the efficiency of loading for the modern size of ships. So, typically, when we talk about ports, we frequently talk about transits as being limited by berth capability or by channel width.

Certainly, those are both factors here and in all of my port complexes. But the one which drives industry far more is economic loading, which is all about depth. That's not predominately a chemical concern, but it's certainly an oil, and certainly in dry bulk commodities, containers, and so on, it is a very significant concern. And looking globally -- I shouldn't say globally. Looking around the United States' East Coast ports, I'm not an economist, and I'm not a transportation expert, and I don't play one on TV, but clearly, all eyes are on the impact of the Panama Canal modernization and what that might forebode for regional ports and hub-and-spoke transportation.

And, typically, the proxy for that entire conversation is 50-foot of depth. In the Gulf of Mexico, the further east you get in towards Louisiana -- I'm talking to a bunch of hydrographers, you know this. The farther east you go, the farther out you have to go to get to 50 feet of depth. Down by Freeport, it's fairly close, and so those are issues for the port complexes, and what infrastructure exists in those complexes. I trust that touches on the question.

CHAIR PERKINS: Great. Thank you very much. Appreciate the panel being here this morning, gentlemen, and for your input. Next up, we have Dr. Callender.

DR. CALLENDER: Thank you, Scott. And I'd like to welcome both the new and returning members to the HSRP's spring meeting. Once again, I really appreciate the opportunity to join the Panel, to have conversations with you, to learn from you, and hopefully share some examples of ways that you can be helpful and useful to us in the NOAA realm.

My time with you this morning is really intended to briefly cover a few topics, including some thoughts on leadership changes at multiple levels in NOAA and beyond, NOAA's commitment and support to the Panel's mission back in Washington, and some ideas on how the partnership with HSRP can stay relevant and impactful through the election year, and into the next administration.

So, within the Ocean Service, I was honored to be named the Assistant Administrator of NOS for the Ocean Service by Dr. Sullivan back in early February.

And I know the relationship that the HSRP has had was really built on previous assistant administrators, Dave Kennedy, Holly Bamford, and now me, and I want to carry on that tradition of engagement at my level with the HSRP.

I'm also taking efforts now to solidify the rest of the Ocean Service leadership team, and I'm working to recruit a permanent deputy assistant administrator for the Ocean Service now. I don't have that recruitment out on the street yet, but I hope to have that out fairly soon.

The strength of the partnership between the Ocean Service and HSRP would not be possible without the leadership of the NOS office directors that are represented here. Rich Edwing from the Center for Operational Oceanographic Products and Services; Juliana Blackwell, Director of the National Geodetic Survey, and Rear Admiral Gerd Glang of the Office of Coast Survey.

You'll be hearing from each of these office directors later this morning, providing more in depth report in their offices' efforts in the current fiscal year, as well as planned activities in the future.

Rich will talk about some context on the breadth and value of the Gulf Region to the CO-OPS products, service, and partnerships.

Juliana will report on NGS activities for this current fiscal year, including advancements in customer engagement, and the GRAV-D progress.

Admiral Glang will be reporting on successful use of new data sources to determine and approve chart accuracy and support charting priorities.

As you heard from Chairman Perkins this morning, and mentioned earlier, Admiral Glang will be retiring from NOAA and as Director of the Coast Survey by September 1 after nearly 33 years of total active and dedicated duty service.

Under Admiral Glang's leadership, NOAA has instituted a strategic modernization of its charting system, significantly reducing the time required when customers receive chart updates, and has made advancements in teaming interoperable charting and observation data into optimized planning and real time decision making for the mariner.

Some of Coast Survey's accomplishments during Admiral Glang's tenure include the development of a new raster chart tile service, a first in the world for any hydrographic office, which enables seamless access and display of our charts on smart devices. The incorporation of satellite-derived bathymetry into the assessment of navigation risk and chart adequacy. Development of operational forecast system models underpinning multiple NOAA missions, and leading the development of the new and improved models.

And finally, recapitalization of all six of the navigation response teams to conduct surveys and respond to emergencies, speeding the resumption of shipping after major storms and protecting life and property from underwater dangers to navigation.

Gerd, on behalf of your NOAA colleagues and everyone here today, I'd like to thank you for the tremendous progress you've made during your time at NOAA, and with Coast Survey, and with the HSRP. You've advanced mapping, charting, navigation, and hydrographic priority missions, and I'm personally gratefully to have worked with you and your team. And I know NOS will continue honor your achievements in the years to come. And so I'd like to thank you personally on behalf of the Ocean Service for everything you've brought and done for us.

(Applause.)

And unfortunately, it's too early for toast, but we can work on that one later.

Let me switch gears a little bit. The Panel has made some significant progress on some of the strategic questions and challenges that I put out to you in the Long Beach meeting. And I would urge you, as you continue to move forward, to continue to be very forward-looking in your thinking.

This week's themes are for identification, analysis and actions, those areas. Really, it will be around the needs of navigation services and resilience operations of the future.

And so questions like, what concepts should we consider as we aim to better understand these themes? I'd really like you to continue think in three major areas. One is around technology and innovation. How can we operate in the future? What are the tools that need to be at the fingertips of every mariner and under the deck of every vessel 20 years down the road to ensure safe and efficient navigation, both commercially and recreationally?

NOAA will need to anticipate and change, too, including transmittal and delivery data, information, and real time services that will meet national customer needs.

In terms of data, we heard from the Captain this morning about his views on data from data information, knowledge, and wisdom. Clearly, NOAA's products and services aren't simply for pilots and commercial mariners anymore, but for recreational users and regional stakeholders and coastal communities impacted by changing environmental conditions and impacts like sea level rise. NOAA will continue to look to the Panel for your guidance on what can be advanced and developed to benefit the future needs of future users.

In terms of partnerships, the methodology, delivery, and responsibility of partnership roles will continue to evolve. How will these roles evolve? Certainly, it would be useful for the Panel to propose some thoughts about where we can better coordinate and engage with a variety of partners from academia, research industry, and other professionals outside the Panel as they connect with NOAA.

Are there concepts out there that are taking shape to help predict shifts in partnership responsibilities? Are there steps that NOAA could take to help guide this evolution in partnerships in a direction that's going to be beneficial to getting our products and services out, and making them more used and useful?

So, looking forward through FY16 and beyond. When President Obama was elected in 2008, there was a leadership transition team that was formed to meet with NOAA senior leadership to learn about agency programs and services. And that kind of process, a transition team, will probably be happening again fairly soon. We talked about it a little bit this morning, I know you're thinking, but you need to be very active in terms of thinking about, what are those messages you want to deliver to that new team? The new team, certainly within NOAA, but the new team all the way up into the administration.

It's very likely that the new team coming onboard in the administration will be very interested in what HSRP does, what the navigation services portfolio bring for the country across the board. But I suspect that the new team will want to look at new things; they're not going to go back and say, well, we're going to do the things that the previous administration does. They're going to want to continue to push some new ideas and new thoughts.

For example, we've talked about the concept of resilience, and whether that's a buzzword, if you will, that's going to lose favor. But, clearly, the challenges around coastal flooding, storm surge, are going to be important no matter what we call it. And so I would really urge the Panel to be thinking very forward-looking about, what are those messages you want to put out to the new administration?

So, no matter who comes into the White House, or the composition on the Hill come January, NOAA leadership's support of HSRP will continue. NOS office directors and I will remain in direct support of the HSRP, and we'll certainly serve as linkages to the senior NOAA leadership. So, for example, the connections you made as a Panel with Vice Admiral Brown and with Dr. Cathy Sullivan, you're going to have to reestablish those kind of connections with the new team. And I think it was really important that you did connect with the senior NOAA leadership. I'd urge you to do it as early as you can in the next administration when that energy and that enthusiasm is really starting to grow with the new NOAA leadership team.

For me, this is my first administration transition at a senior level leadership position, and I will absolutely be relying on the HSRP, some of your vision and input, in my transition information that go to the new administration as well.

So, keep strategies and initiatives relevant to key constituents, officials, and industry partners throughout today's political environment. And changes in the administration will be a challenge to any organization. NOAA will continue seize opportunities to nurture and strengthen both new and existing relationships with leaders that have ties to the coast and to coastal industry.

Today's meeting, and the meetings this week, give us an opportunity to do just that. We heard from Jed Webb this morning from Congressman Randy Weber's office. NOAA and the Panel members had a chance to share with Mr. Webb the successes, challenges, and opportunities for port and maritime navigation priorities impacting Congressman Weber's district.

Likewise, hopefully, we can engage in a dialogue and learn from him the critical needs of communities in this region which rely on the maritime industry so that we can think more strategically about planning and budgeting needs for successful stewardship for the future.

In closing, I'd like to thank the Panel for the personal and professional investments you continue to give to NOAA. And I look forward to the contributions the new members that bring to these discussions.

NOAA's navigational observation and geospatial programs are foundational to NOAA's larger mission and services. Without the necessary data and tools for safe, efficient, and effective ocean and coastal navigation, NOAA can't make the best decisions to aid in the development of a next-generational maritime industry that supports a strong national economy.

I look forward to the meeting today, and I look forward to the dialogue and thoughts where the Panel is going to help us go in the future. And with that, I'd like to thank you for your time this morning.

CHAIR PERKINS: Thank you, Dr. Callender. Those remarks are very insightful. In the case of Bill and I -- being, I guess, we'll call the senior leadership of the Panel -- we have both been on this Panel during one contiguous administration. So, we, as well, have not gone through that transition of change of administration in the White House.

So for you new Panel members and for those of you that are in the middle of your terms, you know, that will indeed be a challenge and a unique opportunity for us. And I think we've got a very solid working organization in place now under Admiral Glang's leadership as the DFO, and with the help of NOAA's staff. An what we have worked on in the last year with our process documents and putting that framework in place in how the Panel operates internally I think is really solid to go forward in an efficient manner. So, that will be the challenging going forward.

So, we are right at our scheduled break, but we'd like to take this opportunity just to see if anybody else on the Panel has a question or a comment for Dr. Callender.

DR. CALLENDER: Plus, I'll be around today at least through today and most of tomorrow, as well.

MEMBER MILLER: Joyce Miller. Can you outline the process, since Admiral Glang's retiring, and sometimes NOAA processes are much more complicated than we understand, of how Admiral Glang's successor will be -- or what the timing is and so forth?

DR. CALLENDER: NOAA processes, you really want me to go there? So, there's what's called a Flag Board, and that will be a senior-level selection panel for the next flag officer to replace Admiral Glang. That Flag Board will happen either late this month or early the next month. That'll be a dialogue really with the AA level, the Assistant Administrator level, the Deputy Undersecretary for Operations, the head of the NOAA Corps, to look at candidates, very similar to how you would look at Senior Executive Service candidates, there's a lot of criteria for that.

The process then goes all the way to the Secretary of Commerce to make that approval. And I believe it goes to the Senate as well. Is that still true or has that changed? Yeah, I thought that was changed.

So, Admiral Glang is retiring, I believe, right around the 1st of September -- and I don't want to go into too much detail about his plans, but we hope to actually have a name of someone before that. I'd like to be able to see if we can engage an appropriate level of transition with that individual so that we don't lose the momentum that we've had in Coast Survey, where I think Admiral Glang has done an amazing job, as well as I don't want to lose that transition with that individual for the Panel as well.

I don't know if you want to add anything to that, Gerd?

RDML GLANG: Thanks, Dr. Callender. Gerd Glang. So, there is a process, Russell's outlined it, the Flag Advisory Board will meet, as he said, later this month or beginning of April. Then there's a series of interviews. At the point where the Secretary of Commerce approves the nomination is when an announcement could be made of a director-designee. And then the package goes to the White House for appointment by the President. And so we would hope that the announcement of the director-designee happens certainly by May sometime, but in our transition planning, the hope is that we can have that long overlap.

And then, yeah, we would have the appointment, or sort of the official change of command, if you will, on or around September 1. And as Russell mentioned, I'll have quite a bit of leave accumulated, so I'll be winking off and disappearing probably by the end of June.

MEMBER BRIGHAM: Lawson Brigham. I'm sure the Panel understands the importance of the position of the hydrographer of the United States, and the international role -- not only all of this, and domestic politics and whatever -- but the huge significance of this flag officer being a hydrographer in representing all of our interests around the planet. So I guess we can get input to the Flag Board, as a citizen, or maybe an HSRP member, because I touch with IHO and the Arctic Regional Hydrographic Commission, and I get a lot of input. So, again, I just, in the public forum, recognize the importance internationally of this particular flag officer role as a hydrographer.

CHAIR PERKINS: Thank you, Lawson. That's an area that I'm unfamiliar with, with how the Flag Advisory Board operates, but that's something that we can look into and I appreciate your comments.

DR. CALLENDER: I would certainly welcome conversations with the board members and any thoughts on that since you will be meeting with that individual, it could certainly be useful to me.

CHAIR PERKINS: Okay. It is 10:23. We are a little behind schedule, but not bad for this particular group. If we can take a 15-minute break and then reconvene. Next on the agenda are the briefings from the Tri-Service Directors. So please try to be back promptly within 15 minutes or less. Thank you.

(Whereupon, the above-entitled matter went off the record at 10:24 a.m. and resumed at 10:40 a.m.)

CHAIR PERKINS: Thank you, Lynne. And Panelists, if you can find your way back to your seats, please. I have received a couple comments during the break. One is that some of the people in attendance are having a hard time hearing some of the panelists when you're speaking, so please try to make sure to slide the microphone a little closer, speak a little more directly into the microphone. That'll assist both the court reporter and the listening public behind us.

For the members of the public that are here, I just want to mention that there is a sign-in sheet outside the door. If you're willing, we'd like to record everyone who's in attendance from the public on that sign-in sheet. There will be a public comment period later this afternoon where you have an opportunity as the public to address the Panel or NOAA leadership as well.

(Pause.)

CHAIR PERKINS: Juliana, would you mind going out of order for the sake of conservation of time?

MR. EDWING: Well, good morning, everyone. Again, I'm Richard Edwing, Director of the Center for Operational Oceanographic Products and Services. And my presentation this morning is going to be talking about some of the milestones and accomplishments we have planned for the remainder of this year, and then going into '17 as well. As you know, we're halfway through '16, but actually didn't get the budget until not too recently and actually just finalized our milestones for '16. And NOAA has kind of a new annual operating plan process which allows us to kind of put markers in '17 as well. So, we'll be talking about both years.

And in the presentation, just kind of loosely been have been my accomplishments under coastal intelligence and resilient coastal communities, which are two of the three NOS Roadmap Priorities.

So, first, this year and next year we'll be adding at least three more new PORTS systems. We have 25 right now around the country, this gets us to 28, and I'm fairly confident there'll be a few more online before the end of FY17.

These three are all relatively small ones. Savannah, Georgia's getting one, just an air gap sensor at first out at Talmadge Bridge, and then we'll incorporate the Fort Pulaski NWLON gage into that as well. But I suspect once they've had this air gap sensor full out, they'll be expanding the supports in the future.

Up in the Great Lakes, in Cleveland, Ohio, we're going to be actually converting a current meter. We've had a demonstration project up in the Great Lakes where we've been operating three current meters where the sustainable O&M funds are no longer there. The Lake Carriers' Association is supporting the current meter that's in Cleveland, and converting that into a PORTS system, because that's our sustainable mechanism for these centers. And that's happening this year.

And then kind of a neat one is -- so there's the Cuyahoga current meter in relationship to the Cleveland water level gage that will also be incorporated.

And kind of a nice partnership one is up in Cape Cod, which is a wave buoy. This is being funded by the Massachusetts Department of Transportation, the funding is coming to my office, but IOOS Regional Association is going to be the operator of the wave buoy.

And, actually, in a course of conversations with the community, it turns out USGS had a wave buoy on the shelf that they offered up to be used for this PORTS system, and so the partner only has to pay for a spare and not another. So, a lot of partners there and kind of a neat project, particularly since we're able to engage the IOOS Regional Association there.

So, a couple of ones that are circling the airport. We've actually got two here in Texas. Corpus Christi, there's been a lot of conversations going on with Corpus Christi, which is a very large port here in Texas. They're interested in establishing medium-sized PORTS. And then we've had one in Matagorda Bay that's been kind of in progress for a couple of years now. And we're waiting on permission from the Coast Guard to actually install it. It's been kind of dragging on, so that's why I don't have it on the "for sure" list here, but I'm hoping that one will reach the finish line as well.

Up in the Great Lakes as well, I was just up in Cleveland at the Waterways Conference a couple of weeks ago, and the lake pilots are very interested in making the Toledo, there's another one of the three current meters is in the Port of Toledo, and they're very interested in converting that one into a PORTS system, because they seemed a little panicked that that one might go away at some point.

So, the PORTS system is continuing to grow. And then, of course, it's just not about installing new PORTS, there's always lots of work and a growing amount of work with the existing ports. Lots of existing ports are adding sensors, I'm not going to read through this lists, and some of these are done. You can see it's mainly in the visibility and air gap areas. Actually, I think the Port of Charleston should be on this list as well because they have one air gap center, and they want to add a second one to that.

And it's just not adding new sensors, but in the right-hand column, sometimes we have to move them, sometimes we have to upgrade the stations, and do different things. The one thing I can -- and I won't read through the list -- but the one thing I'll point at on there is the Connecticut Department of Transportation decided they wanted to harden the PORTS water level stations that were in New Haven and New London so they could better survive storms, to provide storm surge information.

So they're enhancing the maritime -- these were obviously installed for the safety of transportation, but now being also hardened for resilience purposes.

AIS, I've been talking about this to the Panel for quite some time, and we've heard from a number of stakeholders that have come before us, how much they want PORTS information integrated into AIS. We did our testing and work with the Coast Guard many years ago, and kind of did everything we needed to do on our side, and was really kind of -- we were waiting on the Coast Guard to make some software changes on their side. And they were kind of looking at a two-step process: one was a short-term interim process where they just going to do it at a few locations, and then they were going to do it nationally when they rolled out the national AIS system.

At any rate, they decided to wait until they got their national system going. And just this last fall, they wanted to do their first operational test in Chesapeake Bay, and they came out to install the software in Chesapeake Bay, and there were some issues with it. So they've gone back to tweak that software, and we've not been notified when they'll test it next. But once they test it in Chesapeake Bay, we'll then be able to implement it across the rest of the nation, wherever there's another PORTS system out there, we'll be able to integrate it into the Coast Guard national AIS system.

And after that, we'll then work on integrating the NWLON data, and modeling forecast data as well, to get that out to the mariner. And that gets a little bit to the integration issue that people were -- at least in one small area that people were talking about.

And speaking of modeling, and it's not on this slide, but we're in the middle of a shift of paradigm in how we do modeling. The original method was to establish a model, an individual model for each bay and harbor, and we're up to kind of 15 individual models at this point, but we've been switching over now to these offshore regional models, for several reasons.

First of all, the boundary conditions provided by these offshore regional models. And then we have these regional models that will then nest up into the individual ports and estuaries and allows them to be all one model. So instead of building 25 or 30 individual models, we'll be building around a dozen larger regional models that nest up into the ports and estuaries and it makes it a lot easier to maintain.

But in addition to that ongoing paradigm, and actually the very first regional model was down here in the Gulf of Mexico, we have the northern Gulf of Mexico regional model, which was the first one implemented, that was done last year.

But building on that effort, we have a number of other things going. In Tampa Bay, the Weather Service kind of has a test bed there for doing things, and they kind of were developing a model to do -- they were starting to forecast water level of information for mariners, but doing it at mean sea level, which wasn't the right datum. But they were also doing things where they were putting dots, if you will, along the channel, and you could click on those dots and get better weather forecast information, as well as forecast visibility information. They come up with methodology there to forecast visibility.

So we got together with them, and we're taking the good things that they've done in terms of the weather forecasting and the visibility forecasting, and we're integrating it into our Tampa Bay model, so there's only one model that people are going to come to for both the weather and the water information, at least for the maritime community.

And then once the Weather Service takes some of what they've done in their test bed and replicate it around some other areas, particularly the visibility forecasting, we can then also then integrate that into our other models.

We've also got another nice partnership going on between Coast Survey, CO-OPS, IOOS, and NESDIS, to look at data simulation, how to simulate data from different sources. You know, water levels, waves, winds into a model to both better force that model and come up with better results, and also to better validate that model.

So we started developing a West Coast Operational Forecast System. Again, a large offshore regional model. And at the same time, developing and evaluating the data simulation techniques. So, in '17, we'll be rolling out, making operational just that kind of core offshore model, but at the same time, evaluating the benefits that data simulation brings, and evaluating how much we want to then integrate that into other models. Just because we can do some things, doesn't mean we should do things; we need to see how much benefit these data simulation techniques do bring.

And then last, we're actually swinging back now to the Great Lakes. The Great Lakes were the very first operational forecast models that were rolled out in the Ocean Service in 2004-05 timeframe, and it's time now to go back and retrofit these, upgrade them to where we're at today.

These models were developed originally by GLERL and Ohio State University and transitioned over to NOS. GLERL has been actively working on upgrading these models since then. So just this next quarter we'll be rolling out a new Lake Erie operation. So there's the West Coast Operational Forecast model. And here's Lake Erie. And so the benefits of the newer models are going to be high resolution grids, it's going to forecast out much further into the future, and it's also going to set the stage for a harmful algal bloom model that's coming in '17, which I'll talk about in a couple minutes.

So, current surveys, we do current surveys around the country to update the tidal current prediction tables. I think it was the last meeting I talked about how we just completed the first phase of a three-year effort up in Puget Sound. This is the largest tidal current survey we've ever done, about 140 locations. So, last year was in southern Puget Sound. This year, this summer, we're going to be doing the middle of Puget Sound, and next year we'll be completing the survey up in the northern Puget Sound.

We were very fortunate last year. The survey went very well. All the children came home. Sometimes current meters, can't always recover all of them because of various issues, but we always try to learn from those lessons, but we're getting a lot better at that. So that's a big, that's a large survey that's going on.

A smaller one we're doing this year is in Cape Fear here on the East Coast in North Carolina. Going up the river we got a lot of reports from the pilots and other users there that the predictions are way out of whack. And so this is about, I don't know, about a dozen deployments down there taking place this year.

And then we're in planning for doing a South Texas next year in Corpus Christi and in Laguna Madre area. We've already been working with CBI and some of our other stakeholders in the area to kind of come in and gather requirements, you know, what existing locations do we need to go back to, what new locations do we need to do, what locations may not be needed any longer in terms of updating locations? So we're actively reconning and planning that location for next year.

So, VDatum. VDatum is a tool to transform back and forth between geodetic and tidal datums. It's a tri-office collaboration between Coast Survey and National Geodetic Survey. CO-OPS' main role right now is to collect the water level information that's needed to reduce the uncertainty in the VDatum models. We've actually completed the VDatum models for around CONUS, but they're at different levels of uncertainty because dependent -- you know, when they were rolled out, we had different levels of observations, both geodetic and GPS and water levels, so now we're working our way back through the models and getting it to the same level, same minimum threshold of uncertainty. So we're doing a lot of work up in the Pacific Northwest this year and next in terms of gaging.

Something we're excited about is we're transitioning the primary water level sensor in our network to a Microwave Water Level technology. And this is actually a really great example of how beneficial new technology can be. You know, on the right-hand -- well, actually, both of these pictures are of our acoustic sensor, which is our present sensor. But you can see the acoustic sensor, which is at, you know, on the left-hand side, sits on top of the stilling well that goes down into this protective well that goes down into the water. Inside that six-inch well there's a one inch tube that the acoustic signal pulses down. But, you know, a well that's under water, it gets biofouling, it gets silted in, the brackets get corroded, it gets, you know, banged into. We've got to put divers in the water to maintain it and diving's becoming more and more expensive and just more and more regulations on it. So, the Microwave is totally non-contact with the water, so we eliminate all that in-water stuff. The sensor itself actually costs about the same as the acoustic sensor, but all those components that go along with it we don't need. We still need some bracketry, but so it's a cheaper sensor to maintain.

It's also a more accurate sensor, particularly in high energy environments. In high energy environments, with water racing up and down that protective well, sometimes the measurements would not be as accurate as we would like. The Microwave can track those much better. And the other thing is we're pretty confident we can dual-purpose this and turn this into a wave gauge as well and start putting out wave measurements. So, you know, all the places where I have water level gauges at we can use the Microwave and we'll be able to put out wave measurements.

But, first things first, we have to get these things deployed out there. We're kind of doing it slowly but surely. We have to have a year transition between both sensors. We're very conservative and cautious how we transition technology, particularly our primary sensor, because we don't want to be introducing any sort of either systemic or local issues when we make these swap-outs. So we don't pull the acoustic until we know we've got good agreement between the old and the new technology.

So, out of 210 NWLON we've got 27 right now that have these installed. Seven have been fully transitioned, which means we've completed that year of comparison. And there's 22 other stations that have these Microwave, that 16 are fully transitioned. And the 16 that are fully transitioned, transitions may be a little misleading, you know, they were really installed right from the get-go with the Microwave.

Okay, so, just transitioning over to resilience. You know, harmful algal bloom forecasting. We've got our operational -- we have operational harmful algal bloom forecasting models here in the Gulf, both along the west coast of Florida and the east coast of Texas. It's the most active areas for harmful algal blooms down here in the Coast, but you heard discussions of, I think it was Glen mentioned this morning, about all the issues up on Toledo and Lake Erie.

And it's been an experimental model that's been running for a couple of years developed by the National Centers for Coast Ocean Science, one of our sister offices in the Ocean Service. That's in the process of being transitioned over to my office. It's waiting on the Lake Erie Hydrodynamic Model to be implemented, which is next quarter, because they seem to be coupled together. But once that happens, we then take it through its transition phase and the Lake Erie HAB forecast will go fully operational in '17.

Inundation Dashboard. I've spoken to the Panel before about this. This is a web product that is a regional look for storm surge. If you're familiar with our QuickLook Storm Surge product, it kind of takes that to the next level. It's still going to do all the things that QuickLook did in terms of, you know, pulling together all the water level stations being impacted by a storm and providing that real time information kind of in one place.

But then it's going to add in lots of other features, like it'll have an alert system in there. It's going to pull in a lot of historic data so you can look at a station, as the water level's coming in, you can also look and see what's been some of the historic record elevations that have been set at that station before.

And we're also looking to pull in a lot of partner stations to this. It's not just the NOAA stations but other areas that we're partnering with to be able to try and pull in as many of those partner stations as we can, as well, which is a challenge because a lot of those are, you know, operated at different standards, you know, even just getting the data from here, you know, from there to here. Different communication paths can be challenging. But again, working with communities and IOOS regional associations and other partners, we can make that happen.

Right now, the Inundation Dashboard is primarily being tested in Hampton Roads, with Larry's project going on there. New York City, as well, and coastal North Carolina has shown a lot of interest in this. And then kind of nested into this is our Inundation Landmark Project, which, you know, we've talked in the past about communicating storm surge to people. People don't understand when things are referenced to geodetic datums or to tidal datums. They don't know what those mean. So what we're trying to do is, at the local level, relate those, you know, storm surge elevations to the first step, you know, town hall or the knee of General Grant's horse in a park, or maybe down here, Stonewall Jackson's horse. You know, but something that people recognize and know from their community so they can make evacuation decisions.

So, this is still an experimental project. Sea Level Rise Indices. But this is where, you know, if you have an NWLON station nearby, you've got very good sea level trends that are going on there. And those sea level trends are an integrator of land motion, global sea level rise, and regional ocean dynamics. But if you don't, what do you use? So we're working on a product that's more a regional look at sea level rise. And it's pulling in satellite altimetry, which has been measuring sea level now for almost 30 years and is really good off the coast, not so much close to coast. But we're trying to merge those different information sources so people have that type of information.

So, kind of the smoother lines going out to the right are different projections of sea level rise based upon the National Climate Assessments. And we're trying to take some of these blended products and smooth them out a bit so that you can start to see where maybe they're starting to intersect with some of these climate assessments so people can make some choices in terms of which one of these assessments they want to use. So, still more work to be done on this but we've been putting things in peer papers and so forth.

And this is my wrap-up slide. You know, there's a lot of work going on out there, a lot of gaging work going on out there, so we're working as hard as we can. Not a lot of new resources, so we're working as hard as we can to find partnership efforts to make this happen. So, one thing I'm excited about, and I think I spoke about this at the last meeting a bit, is we're partnered with USGS on gaging, first here and the East Coast area because USGS got some Sandy Supplemental Funding to put in some new coastal gages and maybe upgrade some of their other ones. And so what we did was we first selected some of their gages that are in my NWLON gaps.

You know, right now I have about two thirds of the NWLON stations I need to meet the nation's requirements. Most of those gages are in major ports and harbors because, you know, our mission goes back to commerce, so we really got the commerce stuff covered pretty well. But it's all these other areas of the coast, the coastal communities, that aren't covered so well. So, partnerships with USGS are going to help us fill some of those gaps.

So, I think it's about eight or nine stations up along, you know, mainly the Mid-Atlantic Coast that we're going to fill initially. And USGS, you know, they're putting these gages in, they're operating them, they're maintaining them. I'm just getting the data now to my standards, or I will be getting the data to my standards, and these will also help feed into, you know, things like the Coastal Inundation Dashboard and those sorts of things.

This is a pilot project for the East Coast. We hope to -- and the USGS wants to do this just as much as I do -- replicate it around the rest of the U.S. And then we'll also start looking at some of the other gages they have, for things more like the Inundation Dashboard and those sorts of things.

Lawson, President Obama mentioned one new NWLON gauge up in Alaska and here it is. So the Weather Service is actually funding the establishment of the station at Unalakleet. And there's not many stations north of the Aleutian Chain, NWLON stations north of the Aleutian Chain, so that'll be established likely in '17. You know, even though there's some infrastructure here it's still a big challenge. And right now the Corps of Engineers of thinking about rebuilding some of the waterfront where we're looking at for the gage, so we may have to work through that. But one gap at a time. We'll get done up there.

The Park Service has come to us. We've been working with the Park Service the last couple of years because they want to establish long-term gages in some of their national parks, because they're stewards of those natural resources and they want to understand the impacts of sea level rise on those. So, we're working with them. They're going to be putting in initially five gauges. One of those gages is going up in Cook Inlet, a place called Snug Harbor. It's kind of on the opposite side. It's on the west side of Cook Inlet opposite from Anchorage and kind of down the coast maybe halfway, more or less, but that one should be going in this next year.

And then TCOON. You know, I talked a little bit about that. This has been a longstanding one, again, going back 25 years and, you know, up until recently we've played kind of a collaborating partner role where we just provided all the technical expertise to the partners here and they funded it and they built it and they've operated it and it's all been interchangeable with our data.

More recently, there was a little bit of change in how things worked and they came to NOAA and they asked us to be the operator. And so now the funding is coming to us to operate and maintain this network, and actually just awarded the contract last week to do that. We met with the Colonel and his team yesterday evening and the other state partners to kind of get everybody on the same page. So, again, this is a very robust partnership down here.

Are we holding questions for the end or do you want to take them now?

CHAIR PERKINS: Yeah, I think we would be better served to hold the questions till the end.

MR. EDWING: Okay.

CHAIR PERKINS: Thank you, Rich.

MR. EDWING: Thank you.

MS. BLACKWELL: Okay. So, while they're getting the presentation loaded up, we'll go ahead and get started and I'm sure it will catch up with us here in a minute. I'm Juliana Blackwell. I'm the Director of the National Geodetic Survey. And for those of you who are less familiar with NGS, I'm going to take a few moments to go through a few slides to just go over the NGS mission, touch on our stakeholder base, talk a little bit about our strategic plan, and then go into more of the FY16 activities and milestones, which is really the meat of the presentation.

So, with that, looks like they've got it all cued up, oh, and they advanced it for me. Thank you. So, here's the NGS mission statement. To define, maintain, and provide access to the National Spatial Reference System to meet our nation's economic, social, and environmental needs. So, if you're not familiar with geodesy or with NGS, what is the NSRS? The NSRS is a consistent coordinate system that defines latitude, longitude, height, scale, gravity, orientation, and shoreline throughout the United States.

So, one thing that maybe we'll dispel right here about gravity: gravity is not a constant. It's not exactly the same everywhere, and we know that, I'm going to be talking a little bit more about why that's important. But the actual strength and the direction of gravity is different, slightly different, depending on where you are. And why this matters is because it influences where water is going to flow. So, we'll get to that in a little bit more detail, but I thought it was important for you to understand that the things that we measure and why they're important and why gravity is in there is going to play a big role in what we talk about here, what I talk about here at HSRP.

So, who uses the NSRS? Well, the NSRS provides the foundation for transportation, all transportation, navigation, land records, all mapping, charting, and a multitude of other scientific and engineering applications. So, one other thing just for this audience to understand is that while a lot of the activities, products, services, and tools that we talk about are focused on coastal and maritime, in particular, the National Geodetic Survey's mission is to provide this coastal intelligence and information for coastal resiliency, but we also provide that same intelligence and support, resiliency, from coast to coast. So, the entire United States inland as well. And so a lot of the things that we do support that intermodal transportation. And so it's a little bit broader mission that supports all the foundation for mapping and charting at the coast and from coast to coast.

So, what's the stakeholder base for the National Geodetic Survey? What constituents? So it's really kind of two pronged in the sense that NGS, again ,focusing on the geodesy side, but also encompassing the coastal mapping or the shoreline mapping component of the NSRS. So I've broken it out here into two separate entities.

On the left-hand side you'll see the geodesy program's traditional users, which are made up primarily of land surveyors. Over 60 percent of our constituents are land surveyors. We have some folks here on the Panel who are familiar with that, but, you know, for the most part, engineers, GIS users, mapping applications, a whole series of -- you know, on the scientific side of geodesy and academics are utilizing our products on the geodesy side.

From a coastal mapping perspective, you know, I would say our primary stakeholder, constituent, user of our data is the Office of Coast Survey. And that's traditionally been, you know, what we did the shoreline work for, was to be able to apply that to the nautical chart. Certainly, over the years, as more and more people have been able to get access to information and new applications that are available, the number of people and applications for the use of coastal and shoreline mapping has expanded tremendously. The imagery, as well as the elevation data that we collect along the coast, is used by emergency response managers, coastal resource managers, a variety of government agencies, GIS users, commercial recreational folks, insurance industry, and, you know, general public at-large. So, a pretty wide stakeholder base.

So, based on our stakeholder needs and what we've heard, you know, over the years, as well as the advancements in science and technology, the National Geodetic Survey has put all this together into what we call our 10-year plan, our strategic plan. I'm just going to mention this briefly, because I know I've briefed the Panel, but we have some new members and I think it's important to just link back what we do to the strategic plan that is in effect right now.

The 10-year plan goes from 2013 to 2023. About middle of that period we'll go through a refresh and see if it needs to be updated. But the key things out of this, the goals of the objective of the strategic plan, are to support the users of the NSRS, that list of constituents that I just showed you. Also to modernize and improve the National Spatial Reference System.

We know with GPS, and in broader sense, GNSS technology, and with the remote sensing capabilities that are out there now, we've got to improve the accuracy of our information on the NSRS as well as the products, services, and tools that we provide, so that more and more users can benefit from the information that we have.

And then the other goals of our strategic plan are to expand the NSRS stakeholder base through partnerships, education and outreach. And then the other two are more internal about enabling a workforce with a supportive environment and improving organizational and administrative functionality. So I won't bore you with those goals, but we'll talk about more of the operational side.

You've also, if you've been on the Panel, you've heard me talk about the datums. The datums are a-changin'. Okay. 2022 we're replacing NAD 83 and NAVD 88. And if you don't know what those are, I'll be happy to give you a one-on-one with datums and why they're important.

So, in 2022, NGS plans to have a new starting point, a new zero, let's say, for mapping and charting. So, that new zero is going to be somewhere, let's say, magnitude-wise, just to hopefully get your attention, keep your attention about why that matters. Some things will change by very little. Some height information will change by up to 2 meters. Pacific Northwest, you know, you guys have been in, in Alaska, have been really mapping things on a basis where things are not -- you know, the original datums weren't as good as we know they could be now with the technology that we have available.

So, anyhow, we're working hard on doing the projects that we need to be able to roll these datums out, and so that folks that use GPS and GNSS -- and GNSS being all the different types of satellite surveying systems that are out there, whether it's U.S. or other countries -- being able to use that technology to accurately position and determine height no matter where you are and in as close to real time as possible.

NGS is working on providing the tools that will make that transformation between the old and the new hopefully as seamless and as painless as possible. So that's where we're concentrating a lot of our efforts.

So, getting into the specifics of the 2016 activities, the first one being GRAV-D, Gravity for the Redefinition of the American Vertical Datum. This is the project that will, one, be the major data collection for allowing a new datum to support better height information for the U.S. and its territories. It's collecting gravity data from an aircraft, at this point. Perhaps someday it'll be from collecting gravity data from an unmanned vehicle, but right now we're still in the experimental mode with that.

You'll see here the map that's up has the areas in green. Those are areas that have already been collected, processed, and data that's available, not that you all are going to go out and use that data as it is, but the fact is we do put the data out there so folks can touch it, feel it, and the academics can look at it and see if they have any questions or concerns with the data that we're collecting.

The areas in the gold or yellow boxes are those areas that are currently underway. Some areas we start but we're not able to finish within a field season, but we'll get back to those and turn them green as soon as possible.

And then there are some areas in white that probably don't show up very well. Those are areas that are planned for surveys in the very near future.

So, our goal for this year is to complete 53 percent of the U.S. and territories by the end of the fiscal year. We're currently at 49-and-a-half percent. And the survey areas that are currently underway are Florida, Texas, Arizona and soon to be Alaska once the weather is a little bit more favorable.

We also have another goal in making Alaska a priority for the GRAV-D collection. And our goal for this year is to complete 60 percent of Alaska. So, it's a short field season and an expensive place to be but we are focusing on trying to get that done. As you can see from the map here, we've got a lot of effort underway in trying to get that collected.

The scoping study we had done a few years ago talked about the benefits to the U.S. of $240 million from improved floodplain mapping alone. So, what this GRAV-D is going to get us is a new vertical or geopotential baseline for mapping. It's going to make all elevation information much more accurate and easier to combine. So, the LIDAR data that's being collected today, the point clouds and everything, are hopefully being saved. Once there is a new datum in place, that datum can be used as the control for those LIDAR point clouds in the future, which will make everything much more up-to-date and accurate, hopefully.

So, what do we do now with the data that's available for GRAV-D? Well, we're putting out experimental geoid models an annual basis, so it's still not as easy to use as our current geoid models, but we are improving the say that we roll out these experimental geoids so that it'll be a little bit easier to apply to data sets so folks in different parts of the area that's been collected can start to see what the magnitude of change is going to be, on an approximate basis, when we do go to the new datums in 2022.

So those data sets are out there and you can enter information, latitude and longitude, et cetera, and you can see before and after with the experimental geoid models in those areas that have been released.

I've talked also about CORS data probably every time that I've briefed this Panel. CORS is basically the foundation of our National Spatial Reference System. We have currently, you know, over 200 partners, governments, academics, private organizations contributing the data from approximately 2000 stations that are currently in the NOAA CORS network. Most of these are just the data comes to us, we quality control it, we data archive it, we make it available to the public and this becomes the most accurate data for the NSRS, for establishing those ground control points, because not only can we measure what things are staying the same, we can use these to see where things are changing, where the crust is moving, where there's subsidence, where there's uplift, what the magnitude is after an earthquake. So these points are extremely valuable to the NSRS to measure not only stability but also instability and to be able to model that over time and see what the magnitude is over a duration of ten years or 20 years, et cetera.

So while this partnering network of 2000 stations is fantastic, there are different levels of quality I would say. They all meet our minimal bar but some of them are not the most geodetically sound stations and a lot of them are not tied to other global geodetic networks, so what NGS has been planning and has started to do is to come up with a foundation on a CORS network. Hopefully this works, and this is a mock-up of what that foundation CORS network would look like and have this be an NGS NOAA owned asset for a small number of stations, probably about eight in the continental United States and then looking at some other foundation CORS in some of the other areas as you see here on the map to bring those into basically be the ultra-stable CORS that we would use as the best of the best for the NSRS in the future.

We know that we can't install these all at once based on our funding and the time that it takes to get the agreements in place but we do have a goal of installing one foundation CORS per year and being able to use those foundation CORS to tie into the International Terrestrial Reference Frame so while we talk about things for the United States, the fact is, you know, geodesy is international science. We're all one world and we're all trying to figure out what's changing and how things are impacting us whether it's local sea level change or global sea level change.

We also want to see how the plates are moving, et cetera, so having a foundational CORS network that ties to other measurements that are done in the geodetic sciences and have that be part of the international frame is important to make sure that we are connected well into what's happening globally.

One of the other objectives that we have this year in NGS is to develop an RTN validation procedure prototype which will enable all the real time networks that are popping up and established in the United States, allowing them to connect to the NSRS and validate that what data that they're putting out there in positions that are coming out of those locally owned real time networks does match up to the National Spatial Reference System.

And then lastly on this slide, our goal of delivering 350,000 Online Positioning User Service solutions so folks that collect GPS data can submit it to NGS and get a position back to them in a matter of minutes often that references their position relative to the CORS network and to the NSRS so that they are tied to the national system.

Switching gears a little bit and talking more about the coastal mapping side, the shoreline component of NGS, you know, on a yearly basis we have goals of updating a percentage of the national shoreline with the collection of new aerial imagery and elevation data to improve navigational safety; that's the primary role, but this year the goal is to collect an update I should say 5.5 percent of the National Shoreline.

Also to update shoreline in 35 priority ports and analyze 35 ports for changes. All of this gets information is to be applied to the nautical chart but obviously the data that's collected in these areas and the feedback is provided back out and used by a number of entities.

Also we're processing and creating special Superstorm Sandy LIDAR deliverables for the Office of Coast Survey for updates to the nautical charts and working through the IOCM Ocean and Coastal Mapping Program to come up with better ways to utilize the data and provide better tools and information through GIS interfaces and et cetera.

And lastly, we do this on a case by case basis, deliver emergency response or damage assessment type imagery to other federal and the private sector when there's a need to do so, whether it be after a hurricane or when there is tremendous flooding, if we enter into an agreement with an entity or if the National Weather Service asks us to validate some information that they need validated, we can apply some imagery because we have that ability to do so and turn that data around within a matter of hours and make that data available also to the public so that they can get a very quick view on what the impacts are to the infrastructure in those areas most hit.

One of the newer technologies that we implemented last year is the oblique imagery component. Rather than looking straight down at the bird's eye view and producing that aerial imagery is being able to take things at more of an angle so that you see more of the information about the structures, started using that last year and collecting pre-event imagery so that you can do a better job of seeing what the impacts are if you have the before as well as the after ones if an event strikes, so for 2016 oblique georeferenced imagery of the entire west coast has been collected.

The data is used to assess impact to several NOS mission areas including navigation and coastal zone management but it also supports a number of other agencies within NOAA as well as USGS, Army Corp and FEMA. That data is available to the public. You can go in and start clicking down to the tiles and get to a very awesome image of the area so there's a beautiful image of the Golden Gate Bridge that was supplied and I didn't have a chance to insert that into here but I think that that, it hasn't been sent out to the HSRP members. We can get that sent out but the imagery, you can find it here on this link that's provided. There's also an opportunity to show the 2015 imagery as well as the 2016. There are different tabs on there so it's important to keep that historical information and to allow users to be able to see what things looked like before and what they look like with the latest collect.

Rich mentioned this already, but I'll just talk about it again since it's a three office partnership with the V-Datum initiative here. Being able to use V-Datum to connect water level, geodetic geospatial information and do it accurately and to be able to use that as a tool for determining national shoreline and et cetera. So the goal for this year is to release a revised San Francisco Bay vicinity V-datum model. Again it supports coastal resilience, intelligence and place based conservation applications such as Coastal Inundation Modeling, shoreline determination, habitat restoration and this particular update will cover approximately 3300 miles or two percent of the US shoreline.

And lastly, just I spent a few minutes to talk about our increased focus on customer engagement. There's a lot that we're doing scientifically but if we don't get that shared and let people know what we're doing and why we're doing what we're doing and hear back what they need from us then we're doing a disservice, so we have a number of initiatives that have been under way for several years now as part of our strategic plan. One of the main things that's going to be completed this year is to complete our transition to a Regional Geodetic Advisory Program.

In the past we've had on a state by state basis agreements with entities and there was a variety whether it was academic or state groups to have an advisor stationed in their office to support that state or that organization and that worked really well for a number of states but what we found is that we really need to be able to have ambassadors geodetically savvy, NOAA savvy individuals communicating with all the other states, too. Not just the ones that were able to enter into agreements with NGS and so we made a decision several years ago that we were going to have a regional based advisor program and we are nearing completion on that and will have completed that by the end of this fiscal year. We currently have an advisor here in Texas. We have Dan Prouty, who is here towards the back of the room. Dan is stationed right now down at Texas A&M Corpus Christi and has been extremely valuable to the group there and others in sharing two-way communication about the NGS products and services as well as providing us feedback about what we at headquarters should be doing differently with our deliverables, but by the end of the year he's going to be transitioned into a regional advisor and overseeing geospatial geodetic and related activities in Texas and in Oklahoma. Likewise the map that you see up here with lots of colors is showing where our region advisor territories will be once this transition is complete.

This is important to be able to roll out information about the datums. Remember, 2022, put that on your calendar. You'll have new datums by 2022. We don't want to, as I saw Dru Smith refer to, we don't want a Catch-2022, a little joke there. So we want to be able to get this information out, prepare people and provide tools and give them, you know, some hands on touches to what this is really going to mean to them when they start looking at their geospatial data and bringing it into the new datums.

So in addition to just saying that we are having regional advisors and they're covering a larger territory we want to make sure that we're providing the appropriate level of training. So we had a goal this year of providing training to 50 percent of the states. Not all of that is in person but through webinars, through our online classes. We know that we're on target to meet that to provide training to entities to at least 50 percent of the states. We hope to have higher numbers in the future years as we continue with this outreach plan.

Part of that is also conducting monthly educational webinars on specific programs, projects, products and services to help better educate our constituents. The webinars are done, they're recorded, the people can go back and play them at different times. We're working very hard on our web presence. We've just hired a web content manager so hopefully within a short amount of time we'll be able to improve the dynamics of our NGS web presence because it's in need of improvement.

And to increase, you know, just those online opportunities including a video library, which very succinctly I would say helps explain a lot of issues related to, you know, why datums are important, why the modernization is important and other aspects related to geodesy and shoreline mapping and related services in the future so if you haven't had a chance to check out our videos they're available through our website or I can send you the link directly but working with a group, COMET out in Colorado, to help us tell our story in plain language and with some great animation so that it makes it a little bit more meaningful to folks.

So again, if you have other ideas about how we can improve any of these activities, projects that I've talked about, customer engagement, what we could do better not just at NGS but for all of our offices, we would love to hear that from the Panel as well, so thank you very much for your time.

CHAIR PERKINS: Thank you, Juliana. Admiral.

RDML GLANG: Thank you, Mr. Chair. I'm Gerd Glang, director for NOAA's Office of Coast Survey. Speak slowly until my slides catch up. So, this Panel concerns itself with the activities and the missions of our three programs. I wanted to point out that one thing we produce is a Regional Activities Report, which was provided as background to the Panel members that tries to summarize the activities in this region of our three programs in the last several years. I would encourage you to take a look at that.

The other thing is we've provided 101s, introductions, PowerPoints to the Panel members and then we tried to have a bit of a phone call to walk folks through that. Not all of the new members were able to join us for that so those PowerPoints are available as well. I think somewhere there was provided as background the NOS Strategic Plan and the three strategic focus areas for NOS.

What we're trying to establish by showing you our strategic focuses for each of our programs is show you that alignment from the things we do and as they sort of nest up into what NOS' priorities are and then all the way up even into commerce. I won't go into all that day but there's a lot of background material and if any, especially the new Panel members, if you have questions do catch our folks, any of the directors or any of our staff at any time during this week.

So for Coast Survey, I'm going to touch on a few key activities. I'm going to slice through our really rich and delicious that makes up our program and describes just a few things for you. In Coast Survey when we build our annual roadmap of activities, we bring in all of our division chiefs and our deputies and our branch chiefs and our staff people and a wide range of our managers and we force them all to sit in a room and we try to give them sort of the corporate framework and then we allow them to sort of say yeah, but this is my problem and then we try to meet in the middle. So our roadmap, my priorities are really on four areas for us to be the experts, for us to focus on transforming charting, for us to innovate hydrography and for us to change navigation. That's really changing how the users use our tools. So I'm going to report out on a few slices of that cake and the first element be the experts.

I'll talk about our geospatial data management effort and then touch on, give you an update on how we're doing with recapitalizing our NRTs. No, you're good there. You're like reading my mind? Appreciate that. So one thing we started several years ago as we transitioned our organization to using modern GIS tools is we discovered that we really need to organize ourselves and all of our information that lives in many places.

So we set about to craft an Enterprise GIS strategy and this year kind of the key activity that's started is we've actually got our GIS steering committee established and this cuts across the organization. It's office-wide and we're also working with remote sensing division as they are a key provider and a key partner with us to make transparent all of those files and all that spatial data and information we need to manage our work and to plan our project in particular, and then eventually a lot of this gets exposed externally as well. It's all about how we can do our business better.

The other thing, not quite yet. Go back one. One other point I was going to mention is we've got an exciting training and education opportunity to help build out our workforce expertise on GIS. We're establishing a partnership with George Mason University to bring their GIS certificate program onsite to our NOAA offices and the aim is to offer the courses needed for their certificate program over a four semester period and I'm really excited about that and I think a lot of our employees are excited about that as well.

Now we can go to the next slide. Thanks. So I've given you updates on our Navigation Response Team vessels. We're building new vessels so this year we're building hulls number 3 and 4 and those boats have been completed and we're waiting for enough clear, they're being built up in, was it Milwaukee, Russ, up in Wisconsin, so they're waiting for an ice-fee patch of water to actually do the acceptance testing for those boats so we're excited about that.

Next slide. Just to reacquaint you, our Navigation Response Teams are located strategically around the country. They would not trailer their boats over the water of course, but what we're trying to show here is where they're located the intent is for them to be responsive to regional emerging and emergency issues to help reopen ports and then the other challenge here is our workforce challenge. We are seriously understaffed on the NRTs. We've got a variety of mitigation plans in place, how we would augment that but the workforce challenge is now a topic of almost daily management attention so we're chipping away at that. Hoping 2016 is a big year for that.

Second strategic corner for me is to transform our charting business and I've got a lot to say here mainly because I haven't shared it necessarily with the Panel in the past but also because we've made good practice, good progress.

Next slide. Yeah, next slide. Okay, so the three areas if you caught that real quickly was loading the NIS database, completing our template build process and fully implementing our weekly update process. So this is the production workflow and the data workflow for the world we're going towards.

What you don't see is that there continues to be a parallel, a second production line for our Raster based product. It's the Raster based product that fuels our print-on-demand products and the paper chart if you will. Where we want to go is a single production system so the Nautical Charting System II, it's a collection of databases. It will enable that single workflow for all of our charting products and for a lot of reasons I could explain that's really what we have to have.

It starts on the left with source data such as hydrographic surveys and shoreline surveys, other source data that's intended for nautical charts. That's loaded into the Nautical Information System and then that's the big cylinder in the middle, the NIS, and then individual charts exist in their own product databases and they are created and maintained from that source database, the NIS.

All of our product forms, raster, vector, are updated weekly and pushed out through our 24/7 -- through NOAA's 24/7 Integrated Dissemination Program, IDP, service. So the IDP service is what's called the big iron. That's the 24/7 high availability, highly reliable data service that the weather service has stood up, and so we've become a partner with them to ensure that our charts, our products are always available to the public and that we can put that high demand on them for updating our products weekly.

From the user's prospective though you still get to our data through the nauticalcharts.noaa.gov website and then, of course, our NOAA certified chart printing agents, they receive special access to download the weekly products from our FTP site.

Next slide. So here's a dashboard that John Nyberg, Marines Chart Division, maintains. I'll walk you around. All the blue squared areas show where we've actually completed and loaded the database, and you can see we're working our way up around the Texas coast and around the Gulf. We're just over halfway completed in a 3-year effort and we're on track and on progress, and I'm always optimistic we might get a little bit ahead of schedule. This is a huge effort because we're basically building a database and at the same time maintaining all the products across both the production systems.

Next slide. So, let me talk about templates. When you push all your data into a vector database and you're no longer maintaining the raster product, what you need to figure out is how do you build a paper chart or a raster chart because there's still a demand for that. So key to that is building these templates of all of our charts and, keep in mind, we've got over 1020 charts, so for each of these charts we have to build a template, and we've spent quite a few years working with Esri to get these tools to where we can build a chart in a reasonable amount of time. Early versions of this required somewhere in the order of six weeks I think to build a chart template, which when you've got over a thousand, that's just unobtainable. So we're now somewhere down in the order of four workdays and we think there'll be some more economies coming on that, so we're now actually focused on starting to build these templates in the coming year to support that single production and for a variety of reasons, it's a good thing I'll just walk through it.

Next slide. So you run this tool, this kind of, it's called the Nautical Chart Wizard, don't you know, and it actually extracts from the database all the pieces inside that geodatabase that it needs to build a chart, but you can see in the background that there's like pieces of furniture if you will -- chart notes and things like that -- that are sort of tucked up in one corner so at this point you still need, next slide, the cartographer to come in and to arrange that and to build the template. Once you've built the template for the chart, it's good and it's enduring as long as that chart continues to be a product. So there's some manual labor that's required by the cartographer to actually build out the template.

The advantages that, should we want to re-scheme charts, we can do that pretty quickly. We really just need to make sure that the database is fueled with the right information, the right source data, so that's kind of exciting progress there and as we, again, building these chart templates is an extra effort if you will so while they are folks driving the bus and maintaining then engine on the bus while it's driving down the road, we're busy rearranging things elsewhere and so there's a margin of effort that we have to take away from those other routine activities to make sure this gets implemented and that's been the real challenge. This is going to be a very labor intensive process to build out these charts.

Some other tools, next slide. If you're familiar with our charts, we show the channel tabulations, the depths in the federal channels, which the Army Corps maintains and we receive their data so we built some smart tools to help automate the population of those channel tabulations.

Next slide. If you're a mariner, you should be familiar with the source diagram on the traditional paper nautical chart, which tells you the vintage of the data that underlies the chart. In the ENC world, in the vector world, you don't have a source diagram anymore. The equivalent in the ENC world is the Zone of Confidence or Category Zone of Confidence -- CATZOC we call it -- so it's a little bit different and so working through the IHO as part of that working group, there's a new specification for CATZOC, which will start appearing on our paper charts. We have to do this and get away from the legacy source diagram. You can't read this very well. I apologize for the scale, but it's actually promising to be more useful. It will actually tell the mariner something about the positional and depth accuracy and the kinds of survey coverage that are represented by the data on the chart.

Next slide. When you implement a single production system that exists purely in the digital world and we're able to now push all of our updates out weekly. What this means is not just critical updates that come to us through notice to mariners but also large pieces of source data like new shoreline or new hydrographic surveys can now be applied to the charts on a weekly basis and get pushed out to the user. What we're doing is we're breaking the new edition paradigm. Many of you who've been to sea are familiar with oh, a new edition comes out, it gets delivered to the ship, and now the Second Mate makes overtime updating the new edition with all the notices. We're breaking that paradigm in the digital world where charts, we believe chart data needs to be delivered over the internet through websites.

The problem becomes is how does the mariner know where those changes are, so to serve that purpose we've developed a weekly updates page, and we're starting to engage with key stakeholders and users on this. Probably the biggest challenge in getting to adopt the concept of weekly updates will be the National Geospatial-Intelligence Agency, NGA, who maintains and produces the charts for DoD so we're working with them to kind of get their input on how these weekly updates should best be portrayed on the website, so we have these web services, these web pages are up.

Go next slide, and users can discover what's new on their chart in the place they're going for this week. Sort of implied here is that full internet connectivity is going to be coming to ships, right? Think about it. So it's not quite perfect yet, but we know there are challenges, but this is so much better for mariners though in the end. You're going to get the latest information out within a week.

Next slide. So third area, my third corner here is how we're innovating hydrography. I'll offer up two slices here. One is our ongoing challenge to redefine our survey requirements. There's a lot of background information here. I'm just going to give you a snapshot of where we're at. And then the second is some more recent examples of how we're expanding the use of external data in two different ways.

Next slide. If you've ever looked in our NOAA hydrographic surveys priorities document, the last version was from 2012, you'll see this graphic so it's a bit dated. Now that we've established our enterprise GIS and we're trying to recreate all these polygons and spatial areas in a state of the art GIS, we're finding that some of these numbers are a bit squishy, so US EEZ most recently we measured it at could be 3.6 million square nautical miles. No matter. It's a big area that we have to cover. So that's kind of our foundational requirement.

Next slide. In 1994, when we first developed our NHSP, we prioritized our survey requirements into six areas ranging from critical and then you'll see just below that priorities one through five. You can dive into the NHSP and understand this a little bit but it was -- we used kind of an early mapping tool to do this analysis. What it did not take into account for were that the world changes. The sea floor changes, that the areas our charts represent are much more dynamic. And it didn't take into account change in use, that the requirements over a 20-year period could change, got deeper draft vessels, you have emerging ports, got recreational boaters that are more active or less active in different places. So the plan we created 20 years ago for our priorities was by definition locked in and because of external scrutiny, we could not change it easily. We did create a new category called emerging crit, but the problem still remained -- we needed something that could be cranked out and be really an adaptive plan, so, next slide.

So our current approach is to build this all out in a GIS. We're focusing on using a risk-based model, which I've talked about at past meetings. We kind of tried this out up in the Arctic but we want to be able to take into account a variety of factors including the degradation of the hydrographic health in an area so the sea floor is changing. How do we take that into account? We wanted to allow for the meaningful use of outside source data in our survey plan, both to communicate to others where we're going to be working and also to allow them to tell us, hey, I've got data here or I'm working here, and we'll do that through publishing to a web service and making available to the public and other agencies what our activities are.

Next slide. Where we're at right now is kind of focusing on the left side taking into account depth, age of surveys, quality of surveys, and then also through AIS data we can start picking apart and getting at the density vessel traffic in certain places and the types of vessel traffic. Some of these other variables if you will we haven't quite yet cranked into our geospatial model.

Next slide. So the key drivers right now that we're working with are the top two, depth and age of survey. Next slide. And then if you turn the crank on our model and look at where the AIS data is -- so this is really the weighted intersection of vessel AIS tracks, depth areas and the age of our surveys -- you come up with a risk likelihood map. There's still a problem here, though, which is that we really need to break down this AIS data into something that's more meaningful. Where are the deep draft vessels going? Where's the big commerce? Where are perhaps the tankers going and kind of separate out the different types of vessel traffic across the different business sectors.

To do that though, it turns out we've created a big data problem. You start pulling in a year's worth of AIS data across a large region, and that is a big data problem. So we've got a couple of ideas on how to approach that in the coming year, and the hope is that we can break this down, but our little desktop computers were not able to do this in a reasonable amount of time. So let's go to the next slide.

Here's an example of how we're using data from multiple sources to help inform an ongoing hydrographic survey project in Buzzards Bay. So some data discovery, we found there was some USGS interferometric sonar data, which doesn't necessarily meet our charting requirement but we think with some validation we could say something about it and apply it to the chart, making heavy use of LIDAR data that is available and also satellite-derived bathymetry data and you kind of take all of this into account in planning the surveys and deciding what's really important and hopefully we can leverage that other data and update the chart over a larger area than we might otherwise be able to with just the work that Thomas Jefferson is doing there.

Next slide. So here's an interesting example that I actually learned about last year, which is Barnegat Bay where multiple sources of data were compiled to help build a better chart, and this came out of the Sandy effort where we got a little bit of funding for our Integrated Ocean and Coastal Mapping effort. So here a variety of data were used that were both pre and post Sandy event from both NOAA LIDAR surveys and USGS LIDAR surveys, some of our contract surveys, Army Corps data. We even found New Jersey Department of Transportation data; turns out they survey in there. And we also used satellite-derived bathymetry and you sort of stack this all up into a layer cake and you go through a waiting process that's based on how well you're informed about the quality of the data and it turns out you can make a pretty darn good update, so this is kind of an exciting project and what we need to build out are the processes and the database to help support this kind of cartography.

Next slide. Wanted to mention, this has sort of been a, I call it our skunk works project, but we did have an SBIR, Small Business Innovative Research Program that was looking at how do we operationalize radar derived bathymetry, so this is -- take a little Marine X-band radar, park it on the beach over a known point, monitor for an extended period of time, the surface return and you can -- through a variety of algorithms -- process out of that bathymetry. It's not nearly good enough to meet chart standards, but it certainly starts telling you things about how an area is changing over a period of time.

So this is a partnership we've got ongoing with Arete Associates. They're actually doing some operational tests, this one off of Beaufort, North Carolina; another one that's going to happen up in this coming year off of Newport, Oregon and we've got -- there's a variety of academic efforts going on to look at different algorithms to do better with this derived bathymetry, so university in Oregon. I can't think of the name, and also a big partner here has been Korea, so they've helped fund some of this research as well. So just wanted to throw that project out there.

All right, last cornerstone, how we're changing navigation. I'm not going to give you the full update on our Precision Navigation Project in Long Beach. I do want to mention that we've drafted a one-pager. It's called Next Generation Navigation Services. We've shared it with all the Panel members and there are other copies available, and one of the things we're hoping for is feedback. We want to start telling the story about what's possible and where we think we need to go with Next Generation Navigation Services. So we would be interested in your feedback.

Next slide. And the next slide. So kind of the key development in the Long Beach project, if you'll recall the weather forecast office out of Oxnard had developed their Nearshore Wave Model last year, and it's now going through its at least year-long process of validation. You could click on that somewhere and make that thing wiggle. It might, maybe not. It is an animated gif. So the data from that Nearshore Wave Prediction Model is being run -- that model is being run by the National Centers for Environmental Prediction. That's kind of the modeling powerhouse under the weather service, and then being served up through their website. There's a link there. That's all right.

It was late at night when I tried to make the gif work. The point is that the model is out there. It's being tested. The pilots are in the evaluation phase right now of their decision support tool. If you recall one of the key pieces was having the ship models that are used in their decision support tool for under keel clearance, getting those validated so they have a suite of equipment and inertial motion unit that they're moving from ship to ship and testing opportunistically.

NCEP, as I mentioned, has made the wave model more robust so it's operationally available for that decision support tool. There's still some tuning that needs to be happening on the model and of course, through Julie Thomas and the Southern California Coastal Ocean Observing System, we're looking at another year of funding for those two additional wave buoys that were put out there. So we're happy to talk to you more about this off line. I just didn't have the full amount of time to walk everybody through the Long Beach Project.

Next slide. So here's the roll out of our raster chart tile service. It was a soft roll out. It happened in December of 2015. The launch is really a soft launch. We've been working in developing this for the last 18 months very closely with industry partners, but you can access our tile service. So what we've done is we've taken all of our raster charts -- imagine those big sheets of paper in a digital world -- and we've cut them all up into millions of tiles and then stacked them in a certain order where we manage the precedence, removed some of the clutter and the interferences that might happen because of nodes and are serving those up in a tile service -- also through the weather service's IDP -- and we're making those available in an online version.

The next release of the tile service will enable an offline version, so users can actually download the region of interest -- the tiles in their region of interest -- to their device and use those for navigating on and for situational awareness on our charts. I have an app, a commercial app that's free, and I can show you that later on and how well the tile service works.

So last slide for me. This is screen grab from a commercial app called CIQ. The version I have is $25, runs on my iPad. I had the opportunity to ride the NOAA Ship Thomas Jefferson last week from Norfolk up to Curtis Bay, just by Baltimore, and we were coming out of Hampton Roads, the Thimble Shoals Channel and you can see the island for the Chesapeake Bay Bridge Tunnel, the south island. There' a little "t" with a diamond.

Rich mentioned Coast Guard experimenting with pushing out PORTS data over AIS and I went well, gee, what's that "t," and I pushed my fat finger on that "t" and up popped Bay Bridge Tunnel. There's the time, the water level at the gauge and some met data to go with it, so here's an example of really experiencing AIS data serving up other coastal intelligence. I thought that was cool.

MR. EDWING: That's my folks. We operate --

RDML GLANG: Oh, you guys are doing that?

MR. EDWING: Yes, we're doing that.

RDML GLANG: So that's the nirvana where we want to go, so --

MR. EDWING: That's why you can see it from there.

RDML GLANG: So that's all I had, sort of round robin on the thick and delicious cake at Coast of Survey.

(Applause.)

CHAIR PERKINS: Excellent presentations. Thank you to all three of you. Juliana, I do just want to give a shout out to the geodetic advisor, Dana from California, and Bill from Arizona. Personally had a chance to get them engaged with a customer of mine at the Bureau of Reclamation. They did a wonderful job of helping that customer understand the pro and the con of moving new current data back to a prior datum, so those guys are really providing a good service out there. Lawson, you did pass me a note, so would you like to go first with questions?

MEMBER BRIGHAM: Sure. Lawson Brigham. It relates narrowly to one of Rich's issues and it's hardening the sites, and I'm interested in the sites off where there's a naval base or, you know, like you mentioned New London, so I'm familiar why we want a hardened site there because of the submarine base and it's like Bremerton or Hampton Roads or you name it, San Diego, is the Navy brought into that as a supporter of that effort?

I know that in your efforts you have connections to Corps and the Coast Guard, but I'm really interested regionally and locally your connections to DoD, and this relates to Juliana's presentation and the relationship of the National Spatial -- the whole system and its relationship to DoD. Just as an example, you all know we have missiles in the ground and a ballistic missile system in Alaska, so I would think that the mapping and elevation has something to do with that system there and accurately, so I'm interested in the relationship of the DoD beyond the Corps -- not only in funding but just as user. Thank you.

MR. EDWING: Okay, but I want to make sure I understand your question. Are you talking about DoD in terms of hardening stations, or --

MEMBER BRIGHAM: Well, just the information available and its relationship to successfully navigating our naval combatants in and then out of all of these high valuable places besides the commercial world.

MR. EDWING: Right, right. Well, with respect to the Navy, they're our partners in two PORTS systems. One is the lower Chesapeake Bay, Norfolk/Hampton area. Also up in New London River and that one's there really for the submarine base and actually we've recently been contacted about potentially establishing one for Kings Bay, Georgia, which is another submarine base because they've been having some issues there. So with the Navy that's been the, now there's other Naval bases where we've put our NWLON stations and those sorts of things but, you know, it's been kind of a base-by-base sort of approach, not a national approach.

CHAIR PERKINS: Joyce.

MEMBER MILLER: Yes, question for Gerd and Juliana. How is the 2022 change going to affect the charts? Or is it with the VDatum and so forth?

CHAIR PERKINS: Joyce, can you repeat the question a little louder so the audience can hear as well, please?

MEMBER MILLER: Sorry. I asked how is the 2022 change in the datum going to affect the nautical charts. You know, is it a huge impact or none at all, or --

MR. EDWING: Let me try, yes. So Juliana talked about updating the national, you know, the vertical data, but actually coincident with that we're going to be doing two other datum updates on the water level side. The tidal datums will be moving to a new Tidal Datum Epoch at that time and also the International Great Lakes Datum will be updated at that same time and it's really going to be more, it's going to be the magnitude of that change on the water level side I think that's going to potentially affect the charts but until we kind of do that analysis and see what the scale of that adjustment is we're not going to know. If it's small enough it kind of still fits within the error budget. If it's big enough, it's going to maybe cause satellites to need to be readjusted.

CHAIR PERKINS: Ed.

MEMBER SAADE: So when we do things like you're getting ready to initiate your Great Lakes models, do we coordinate that with the Canadians and is there a model that's going to come out for Lake Erie that's also encompasses the Canadian side of the lake and the same question for when you're down along the border with Mexico?

MR. EDWING: So in the Great Lakes area, there's lots of different committees set up to ensure coordination and responsible bilateral management of the water, you know, the water resources up in the Great Lakes, so there's modeling committees and there's vertical control committees. Now in the hydrodynamic modeling side, our models do cover the entire lake. We don't really necessarily coordinate those models with the Canadians; however, the update of the IGLD is a joint update effort and that's being, you know, closely coordinated and through these coordinating committees that exists under different treaties, and Juliana's shop is very much involved in that as well up in the Great Lakes.

MS. BLACKWELL: Just to add to that, we are all working together with the Canadians on not only the Great Lakes datum but also with the new datums, the 2022. Not only Canada, but also Mexico and other countries further south and so on an international basis what we would really love to have is that when we roll out the new starting point for the geopotential what will become the vertical datum starting points, we would like North and South America and the countries nearby to all agree on what to use. They may or they may not, but right now we have really good progress with working with Canada and also with Mexico so that we don't have a similar situation where we worked with Canada before on NAVD 88. We adopted it here in the U.S. Canada didn't.

We would like to not repeat that. We would like to be able to say, you know, we're all agreeing on the same thing and it's seamless when you cross the border. You don't have to change datums and here's what we're all using. At the scientific level, we've got pretty good headway with working with those countries that are connected to us, and we're trying to make bigger inroads with the South American countries as well.

MEMBER SAADE: Just a quick follow-up. So we're working extensively in places like Columbia and throughout the northern part of South America, and it's a big issue there and if there was a way that we could help, I know the people that I deal with in those countries that are the equivalent of NOAA are looking for people to talk to and questions to ask, so if there's a way we can connect it, I'd be happy to try and make that happen.

MS. BLACKWELL: Okay. We can talk some more offline. We have an NSRS modernization manager, Dru Smith, and he would be the point person that I would say to point everybody to if they have interest and he may be able to follow-up with them or the right person from NGS to connect but I can get that information to you.

CHAIR PERKINS: Okay. Let's do one more, Lindsay, because we are 15 minutes into our scheduled lunch period now.

MEMBER GEE: Yes, Lindsay Gee. I just, I guess it's both Rich and Gerd regarding the PORTS system and then the Next Generation Navigation. It seems you got a great foundation with the PORTS system but where do you see that going and sort of the demand I think Captain Penoyer spoke this morning about that we're sort of the cusp of this revolution with apps and your use of these kind of data. Do you see that you've got enough systems out there to provide that base foundation, or how does then the public private kind of relationship work then? Both at the data level?

I think Joyce asked the question earlier about, I'm not sure though who funds each one of the PORTS systems, but how that's an ongoing sort of momentum for that and it's enough to then provide that sort of infrastructure for the Next Generation Navigation that we're kind of just starting to see, so it's a question for both of you really. How you see the private public relationship in that ongoing with both PORTS and the Next Generation Nav?

MR. EDWING: So I'll start. So with respect to the PORTS system, I'd say at this point we've got -- I'd have to go back and look, but we've got most of the major ports in the -- seaports in the U.S. covered with the PORTS system now, at least partially in some cases because some sea ports maybe just are starting to build their ports. And then kind of related to that there's the models, 100 dynamic models, that are coming right along with that, and we're going to, you know, that, we're still a little ways away from completing that system but between those two things we're going to have a lot of information available in these locations, so and I think it goes back to then how do you better integrate and make that data available to people in ways that they don't have to be going to different places and, you know, because it's got to be easily accessible for it to be most useful.

CHAIR PERKINS: Very good. It's been a good session, good Q & A.

RDML GLANG: Hey, sorry, Mr. Chair. Could I -- I just want to point Lindsay, trying to make eye contact here. So this is a great question, and we don't have time unfortunately, but we do have some things that could be thought-provoking to help inform you. Our Precision Nav briefing talks about how we envision delivering these streams of coastal intelligence.

The other half of that, which Rich was talking to, is kind of the requirements. In different places, ports and regions have different requirements for environmental intelligence for whether it's in one place wind data may be important or current data may be important or fog forecasting might be more important, and so part of that is getting to know your customers and meeting with them and understanding those, your stakeholders and understanding what decisions they need to make so that -- I'll just set that up, and maybe we can have a conversation later. Thank you, Mr. Chair.

CHAIR PERKINS: All right. We're on lunch time, so we have a working luncheon for the Panel members in the Ann Milligan Gray Room. We are 15 minutes off schedule, so we will reconvene back here at 1:15 p.m. Great. Thank you.

(Whereupon, the above-entitled matter went off the record at 12:16 p.m. and resumed at 1:22 p.m.)

CHAIR PERKINS: All right, we're going to reconvene the second half of today's meetings for the Hydrographic Services Review Panel Spring 2016 meeting. One point of order that we will be taking nominations and working through a process for election of, or selection rather, of chair and vice chair positions over the course of the next day and a half, so just want to make sure that's recorded in the record that there will be a process that the Panel undertakes, you know, for the nomination and selection of the positions of chair and vice chair. With that, I will turn it over to Gary Magnuson to introduce the next panel and get us back on track.

MR. MAGNUSON: Thank you, Scott. I sense some good energy in this room. It's not the after lunch droop shall we say, so it's my pleasure to introduce the moderator for our next panel, which his on Navigation Issues and Challenges, Regional Issues and Challenges.

We've got a great group together and Neils Aalund is the moderator and it's my pleasure to introduce him. Neils is senior vice president for Western Gulf, make sure I get this right, Western Gulf Maritime Association and how many get their daily emails from a fellow ride. You know, Neils puts in a lot of energy and effort into that and it's a great document so if you don't get it, maybe he can give you the email address to sign up for it. Is that fair? All right.

Neils is senior vice president for the association which brings together, it's been a nonprofit association since 1968 if I recall, it brings together steamship owners and operators, agents and stevedores and terminal operators as a voice for the region and a national voice, as Neils and I were talking about last night. He also serves on many committees just like your own, including National Association of Maritime Organizations -- right, Ed -- and the Propeller Club International and the Lone Star Harbor Safety Committee, so it's no surprise that when asked to be moderator for this panel, Neils already knew most of the people on the panel so without further ado, Neils.

Oh, I interject, too, we have a little different process for the Panel to give you an additional opportunity to ask questions of the panel. During the course of the presentations -- because they'll be taken in order as they appear in your program -- each speaker will be introduced and give their presentation. The next speaker will be introduced and presentation, so during the course of these many presentations, you can get my attention and I'll provide you a notepad or a notecard to write down a question. Sometimes by waiting until the end of all the presentations, you forget about what you're going to ask so this gives you an option to write down a question, provide it to me, and I'll give them to Neils so he can read them which will be the first action for the Q & A period, which follows all the presentations. And then, of course, the floor will be open for questions and answers, so hope that's understood. Any questions? Seek me out if you want to write down a question, and Neils, it's all yours.

MR. AALUND: Thank you. Before we start I'd like to make a very brief and personal heartfelt thanks to Gary Magnuson. Last week my mother passed and I'm getting credit as the moderator, but it was Gary that put all the miles together, the PowerPoints and pulled this together during a very difficult time for me, so Gary, my heartfelt thanks and I appreciate you stepping in there for me. We have two hours and 15 minutes there afterwards for Q & A and we had lunch together, our Panel, and we decided to try to move very quickly. The last group had three speakers and ran over. We have five so we want to try to stay on track.

CHAIR PERKINS: Thank you very much for that.

MR. AALUND: You're welcome. There's nothing wrong with finishing a little early, too. As this is broadcast on the web, I just wanted to go over this brief introduction for our group. Our session is entitled Navigation: Industry Demands and Future Developments, and the description goes as follows: The Texas Gulf Coast, including Houston/Galveston port areas and the Gulf inter-coastal waterways, faces four mega-trends that are demanding more capacity from its ports and shipping lanes. Significant rise in population, continued growth of oil and gas production, larger ships with expansion of the Panama Canal and increased international trade. This panel will examine how mariners use NOAA's navigational positioning and coastal data and will explore the Next Generation Navigation Services solutions.

I do a lot of speaking at conferences, guest lecturing, interviews for different publications and I'd like to share that although Houston and Galveston have seen phenomenal growth, impressive growth over the years, I suggest that our best chapter is yet to come. We talked this morning about the explosion and capital improvements in the petrol chemical industry, but we also have LNG is a huge factor as a feed stock for the petrol chemical industry and also for an energy source that will make us more competitive with manufacturing.

Another area that hasn't been mentioned is trade with Cuba. You know, people assume that Florida is going to get the bulk of the business but Texas is such an agriport, a big manufacturing port, that we see us as a gateway for Cuban trade when it comes on. We have five speakers. I know all of these people individually. They're true experts. I'd like to just emphasize a common theme that we have here in this area, and that is the spirit of collaboration, partnership and teamwork. We have committees such as HSC, Harbor Safety Committee; PCT, Port Coordination Team; AMSC, Area Maritime Security Committee; it goes on. All of these groups work closely together in a collaborative manner for safety, navigation and environmental initiatives. Yes, our industry is competitive, but what you find here in this area is a great deal of collaboration. We're a great melting pot. I think of these five speakers and the moderator, I think I'm the only one that's a native to this area.

We all come from different places but yet when you get here, people seem to roll up their sleeves and work together. Our area as reported is a mega-port region, tremendous volume of blue water and brown water traffic but we also have like all ports exposure to hurricanes, some from catastrophic and significant impact to others just a precautionary preparation that interrupts what we're doing. We also have seasonal fog that comes every year and it does disrupt traffic and we have to sometimes activate our port coordination team but the players at this table and others work very closely to get it up to speed quickly.

I'd like to give just a brief before we start our Panel discussion to NOAA for their personnel and assets that play an essential role in getting our ports back up running safely and quickly. Our first panel speaker is Captain Sherri Hickman with the Houston Pilots. Her presentation is entitled Ports AIS and Related Safety on the Houston Ship Channel.

Captain Hickman, a former member of the Hydrographic Services Review Panel, Captain Hickman of the Houston Pilots graduated from the Main Maritime Academy in 1985. She sailed for two years with Marine Transport Lines followed by seven years with Keystone Shipping Company. She sailed on multi-product tankers as well as crude oil tankers, taking her around the world. Captain Hickman obtained her Unlimited Masters License when she was 28 years old and, of note, she was the first female master to sail for Keystone Shipping. Also of note, Captain Hickman is the first female pilot hired by the Houston Pilot's Association. The pilots provide an essential service to our industry. They are true experts of our local waterways. Captain Hickman has a reputation as an outstanding and skilled pilot. Captain Hickman.

CAPT. HICKMAN: Well, good afternoon. I was expecting the after lunch doldrums, but I see that that might not be the situation today. It's good to see faces that I've known in the past and those new on the Panel. We had a slight glitch. I am going to show a video. It is of the Houston Pilots. It is ten minutes long so I might cut it, but I want you to take note of the size of the vessels, the volume of the channel and how tight our quarters are on the Houston Ship Channel, so if I start seeing anybody nod off, we're going to kill the video and I'll talk then.

(Video plays.)

MR. AALUND: Sherri, that was an outstanding and brief presentation. Okay, we're going to go out of order. Captain Peter Simons is the Deputy Director of U.S. Coast Guard Retired, Deputy Director of Port of Galveston. His presentation is Port of Galveston and the Case for Reduced Navigation. Before joining the Port of Galveston as its deputy director in 2012, Peter had a stellar career with US Coast Guard beginning with his graduation from the US Coast Guard Academy and later Georgetown University Law School. During his Coast Guard career, Peter served on a number of Coast Guard cutters and at several shore units and was commanding officer of three of those units.

From 1999 to 2012, he served as commanding officer Vessel Traffic Services, Houston/Galveston. During his tour, the VTS commissioned its first electronic tracking system and the staff worked with maritime stakeholders in the region to complete a waterways risk assessment to establish a strategic plan for improvements to navigation in the Galveston Bay Region. The Port of Galveston has a proven track record regarding safety, security and environmental practices. Please help me welcome Captain Peter Simons.

(Applause.)

CAPT. SIMONS: Thanks very much. As Neils indicated, I want to do two things, hopefully relatively quickly this morning. Give you a little bit of background on the Port of Galveston, and second to talk about what I like to refer to as reduced visibility navigation. But, first I want to emphasize that in my Coast Guard career I had a number of opportunities to work with NOAA professionals and like most Coast Guard officers of my generation, I was involved with the responses of both Hurricanes Katrina and Rita and I will tell you, Admiral, and Senior NOAA staff, without your navigational response team we would not have been able to reopen the Port of New Orleans, the Ports of Port Arthur, Beaumont, and Lake Charles as quickly as we did.

And NOAA was a key player in our Incident Management Team in the Incident Command Post that we established up in Alexandria, Louisiana, and I know the Coast Guard is eternally grateful, but I in my role in that response am eternally grateful to the professionals of NOAA, and I know we have Alan Bundt here in the audience someplace. He and I worked well together while I was at the vessel traffic service and as part of the Incident Response and I want to particularly recognize him for his service all those many years ago, but I think the Coast Guard and NOAA have a great working relationship. I was happy to see that you're recapitalizing the NRTS. That's because those are great resources -- not just for NOAA but obviously moving commerce.

Next slide. Or maybe not. Yes, next slide. This is a -- next slide, please. This is a -- I'm sorry. There we go. This is a shot of the Port of Galveston. Most of you will be taking a tour of the port later on this afternoon. Just for reference, we're in the building that's kind of marked by that red arrow on the left hand side of this screen and this is really kind of the western half. You'll notice we have two cruise ships in that day and we'll talk a little bit later on about cruise, navigation particularly from the standpoint of again low visibility and navigation.

Next slide. This is a breakdown of our 2015 revenues, so you can see we're a relatively small port in terms of revenue but really what I want to emphasize by this is that cruise makes up 59 percent of our revenues and it's kind of the holistic cruise revenue package so it's operating in the cruise terminal and there really are not very high margins in operating the cruise terminal. Cruise lines are good businessmen and but we make a lot of money off of parking and all the ancillary services associated with supporting cruise terminal operations.

Next slide, please. So this next slide talks about cruise. The four kind of major economic drivers for the Port of Galveston and the first, if we could go to the next slide, the first in the upper left hand corner, that's Carnival Magic alongside at cruise terminal number one. The first as I said is cruise lines. We have year round service from Carnival and Royal Caribbean; three Carnival ships, one Royal Caribbean ship and the upper right hand corner is the picture of Archer Daniel Midland's grain facility. The lower left hand corner is a picture of one of the first BMWs coming off roll on roll off carrier at Pier 10. We'll talk very briefly about the new BMW facility we've established at the east end of the port.

In the lower right hand picture is a picture obviously of the Del Monte facility at Pier 16-18. So tonnage, back to kind of the port in general, tonnage over the past ten years for us has averaged about 6 million tons a year. As most of you know, ports are ranked based upon the tonnage throughput so that figure puts the Port of Galveston according to the 2014 report from the Corps of Engineers, ranked 53 out of 151 ports so that puts us just below San Juan and just above that famous seaport of Albany, New York.

That said, cruise is really critical to Galveston. I think the Port of Galveston is really the most logical location to house and operate cruise terminal operations. So because most passengers don't weigh a lot at least when they initially go on board the cruise ship, we rank cruise home ports based upon the number of embarkations and disembarkations. Galveston is the fourth largest cruise home port in the United States. Let me say that again, we are the fourth largest cruise home port in the United States and we are the seventh largest in the world. The top three are all in Florida; generally Miami and Fort Lauderdale will vacillate back and forth or alternate back and forth between one and two and then Port Canaveral is almost always number three. We're well outside the number of passengers that they embark. Last year, we embarked 834,616 passengers.

This year, in 2016, we're estimating because of the newer ships and the larger ships that are coming in, approximately 865,000. You measure embarkations and debarkations so last year about 1.6 million total people on and off. To put that in a daily perspective, let's consider what took place this weekend. We had 35,000 people go through the two cruise terminals on Saturday and Sunday. On Sunday alone, we had 4,605 passengers come off the Carnival Magic; 4,674 boarded for this week's cruise.

Similarly, 4,431 passengers came off Royal Caribbean's Liberty of the Seas and 4,485 boarded. That's on one day alone that's a total of 18,000 plus passengers moving through the cruise terminal and I give you those numbers just because when we talk a little bit later on about reduced visibility navigation and the potential impact on holding the cruise ship out, you can just begin to think about from a logistics standpoint what some of the issues are when you hold a cruise ship out even just a couple of hours.

Let's go ahead and go to the next slide. This is a picture of our project to expand cruise terminal number two. We'll have both Royal Caribbean as you can see there, that's Liberty of the Seas and Carnival will be calling a cruise terminal number two. It's a 60,000 square foot facility. There's a bridge on the right hand side that kind of connects to the existing building which is a 90,000 square foot facility. This facility will be used for embarking passengers and to the extent that we do have incidents when ships are delayed to be able to accommodate about 1500 to 1750 people while they await for the arrival of the ship.

We have a related project to upgrade the moorings at cruise terminal number two. The Liberty of the Seas that you see there at 160,000 gross tons is 22,000 gross tons larger than the next ship that we have calling in Galveston.

Next slide. Just very quickly, it's not obviously from a time sensitive standpoint that critical but for us it is a major project and that is a vehicle processing center. It will officially open on April 20. It is actually already open for business. I took this picture actually yesterday afternoon, so you can see in the distance the roll-on/roll-off carrier.

They actually weren't discharging cars to the facility but the white objects just in front of the roll-on/roll-off carrier are all new BMWs and then on the left hand side of that picture the two white buildings, one's a 35,000 square foot vehicle processing center and immediately behind it, difficult to see in the picture, is a car wash/body shop and a charging station facility for electric cars. So for Galveston we actually embarked upon this project as a partnership with Wallenius Alliance Vehicle Services and we did all of the site civil work and built the foundation for the building.

They then contributed the other 50 percent of the project costs by actually finishing the building and fitting it out and BMW will be here for at least ten years plus we hope an additional ten year period.

This week you will see, there's a ship still there today, you will see tomorrow, the first of two vessels carrying BMWs that will arrive this week. The vessel arriving tomorrow is coming from South Africa. That's the first South African service between Galveston and that part of Africa so we're excited about that.

Okay. Let's go ahead and skip the next two slides. There we go. So I want to talk a little bit in the last few minutes here about what I like to call a case for reduced visibility navigation and this slide is actually taken from some statistics the Vessel Traffic Service provided. The blue bar represents the number of hours of fog related delays in the Galveston Bay region. I do again want to recognize the Galveston files. Very often what you'll find is that there is a reduced visibility upriver but we are still able to navigate in Galveston given our proximity to the sea buoy and as a result while in general there were 680 hours of fog related closures along the ship channel that wasn't true necessarily for the Port of Galveston and obviously there's no statistical relationship, you know, from one year to the next in terms of the amount of fog closures.

Some years ago there was a poll of the top 1000 logistics companies and the managers were asked to list their shipping related criteria when selecting carriers for ocean shipping and the highest ranked criteria by 43 percent of the respondents was schedule reliability and consistency. The next most important criteria at about 36 percent was competitive freight rate and the third most important criteria and I think it's about 15 percent was transit time and speed, so no surprise to any of us, right, involved with the maritime community the ability to move cargo, passengers and cargo on time is really critical.

Next slide, please. That didn't come out too well I guess or at least it didn't come out on the monitor but that's a picture of the PORTS system in the Houston/Galveston area. Looks a little bit better up there. That's good. There are six stations in Houston/Galveston, 11 in LA/LB and 15 in Delaware Bay and having navigated all three on Coast Guard cutters, I can tell you that the risk of an incident in Galveston Bay area is higher than it is in those other ports and I think you began to get a sense for that from the video that Captain Hickman was starting to show you, but admittedly the consequences of an event in those ports and particularly in the Delaware Bay area where you have rock outcroppings that essentially define the margins of the channel, admittedly the consequences of an incident in those other ports is much more severe.

That said, I am a big fan of ports. I have been since my time here at the Vessel Traffic Service. We rely upon the system for port planning. In an incident it is a critical piece in the incident command post. It is a critical piece in terms of the planning scenario. It's a critical piece particularly if you have an oil spill in terms of forecasting where the oil is going to go and planning response resources accordingly.

So in my, you know, humble estimation, in my experience there's no question that the PORTS system here makes the channel more efficient and safer and that the maritime community in general but the people who rely upon the maritime community, all of us as consumers, benefit from having that PORTS system. And I'll come back to that in a second when I kind of talk about a couple of concluding thoughts.

So let's go to the next -- last slide here. So on the right hand side is a picture of the PORTS meter at Pier 21. You will see that later on this afternoon. Here's just a couple of thoughts. Rule six of the steering and sailing rules tells a mariner that there are six criteria that he or she will look at before making a decision about what constitutes safe speed. Three of them are data that you can get from a PORTS meter system similar to what we have at Pier 21. So I suggest pier -- from the standpoint of being able to make a go/no go decision, ports in and of itself but as we heard this morning kind of an integrated PORTS system is really critical as we look to expand the envelope in which we operate safe vessel navigation, particularly in Galveston Bay.

I want to talk very briefly about the channel closure implications you see here. A couple of thoughts on the cost of operation. Delay in vessel transits has a particularly significant burden on cruise operations so I mentioned this past Sunday's cruise numbers. That's not an atypical Sunday at the Port of Galveston although we are starting the spring breaks cruise season but that's the equivalent of 60 fully loaded Boeing 747s arriving at the same airport at the same time and all those passengers trying to get home, the logistics that go with resupplying a vessel that's going to be underway again for another week.

The trucks with provision on Sunday I looked out my window, there were 27 trucks lined up to resupply the Carnival Magic. The customs, security and shore staff, all the busses that go with transferring passengers so there's a huge logistics tail that is associated with cruise terminal operations. So Neils wants me to talk for another 20 minutes, but I'm not going to put you guys through that.

Let me just -- the last bullet talks a little bit about the potential role for NOAA. Let me just conclude two thoughts. One, while the train has left the station I'm going to run quickly after the caboose. I think there really needs to be a dialogue about how PORTS is funded. PORTS benefits not just the maritime community. It benefits our entire nation. I think, and I talked about this in the context of grants, I think that the local beneficiary, the port or whomever, needs to have some sort of stake in that so perhaps there's an element in terms of paying for the installation with maintenance then being kind of a federal organization responsibility.

My background, as Neils indicated, is the federal government. I do think that there are some things that governmental entities do very well and I will tell you from an NRT standpoint and from ports maintaining this system is something that I think NOAA does an outstanding job of and I would argue for more federal funding in that regard.

And second suggestion, pause for applause, second is to -- and you're already I think to some extent doing this, but to analyze the current system to suggest improvements to existing systems and I would say not just analyze it but integrate that analysis with the efforts of other agencies. Port and Waterway Safety Assessment for the Coast Guard, which really focuses on navigation safety; Waterways Analysis and Management System, which is an aids to navigation focus; and the NTSB Accident Reports. There is a lot of good information there, sometimes environmental that I think can kind of inform or influence how it is we move the PORTS system forward. Thank you for your time. Look forward to the questions later on.

MR. AALUND: Very good job, Peter. Thank you very much. We're going to move along now. Our next presenter will be Commander Brian Hill, US Coast Guard Retired. He's the director of MARAD's western gulf gateway. He's going to give an update on the Maritime Administration. As the Maritime Administration's western gulf director, Brian's responsibilities for MARAD include all the ports, waterways, intermodal connections and corridors in Texas, Oklahoma, Colorado and New Mexico.

Brian works with the local Texas and Oklahoma ports and other intermodal industries and responsible agencies to improve and strengthen the US Marine Transportation System. Brian is a retired Coast Guard Commander with a diverse maritime transportation port security regulatory planning and maritime admiralty law background including being chief of the 11th Coast Guard District's Ports Waterways and Coastal Section from 2006 to 2011. In this position he oversaw planning for the port security mission and all ports of California.

Brian is also an experienced maritime attorney having served as a Coast Guard attorney in Miami and as a maritime and admiralty law attorney. Brian has a master's degree in security studies from the Naval Post-Graduate School in Monterey, California. In closing, I go to a lot of meetings, programs, activities, and he's everywhere. Brian is very active for boating and advocating for the Maritime Administration. Thank you, Brian.

MR. HILL: Thanks Neils. It's my pleasure to do that. One thing about the Maritime Administration which you're going to see in my slide presentation is our role in the federal government. We are part of the US Department of Transportation. There are like five fingers of the US Department of Transportation; Federal Rail, Federal Highway, Federal Air, Federal Transit, and then Maritime, so we're one of the five modes of the United States Department of Transportation and our role is just to be an advocate for the maritime industry to try to improve maritime commerce because of how important it is to the United States.

Okay, there's the mission statement of what I just said for the Maritime Administration. We're trying to improve port infrastructure, grow industry and maritime labor. Maritime training is one of the roles and missions of the US Maritime Administration, too. Just nearby here, we give some money to the Texas Maritime Academy. We give money to other maritime academies around the country and we actually run the US Merchant Marine Academy up in New York, so training of future mariners for the maritime industry is an important mission of the Maritime Administration, too.

We're a small agency, only several hundred people with a medium budget. A lot of people you can see are at the Merchant Marine Academy and I want to talk about some of the fleet sites and the Gateway Offices in a minute.

I'm not going to make you memorize this slide, but I'm part of the intermodal systems development branch and we're going to talk, we have a strategic -- I'm going to talk more about that, some of the national security role that the Maritime Administration has and as I previously mentioned, financing for vessels and support of the maritime industry.

All right, the branch that I do work for, one of our major projects is we're trying to reduce congestion in our ports because our ports are already busy. They're scheduled to double the amount of cargos over the next 20 years so how are we going to handle that when most of our ports are already constricted. They can't grow anymore. Most of our ports around the country are surrounded by population so they can't physically grow so they have to find a way to move cargo more efficiently through the ports so we're going to talk about that.

Port development, we have some marine highway grants, TIGER grants, a new fast lane grant I'll talk about in a second, too. One thing that the Maritime Administration does do, so not all of the people are in headquarters, the vast majority are but there are ten of us around the country that can be the local face for the Maritime Administration for the ports in my area. In my area, it's kind of hard to see there, but I have all the ports in Texas and Oklahoma in my territory. And yes, there are ports in Oklahoma. Tulsa has a pretty large port on the Arkansas River but there are 17 or 18 other ports in Texas that fall under my area and my goal is to be a point of contact for all the ports to come to if they need some federal assistance with some problem that they have.

Some of the things that we do do, I mentioned our national security role. We have three military cargo ports in Texas. There are 18 around the country that we as MARAD certify that they are still able and competent to be able and competent to be able to handle military cargo. The Port of Beaumont is the busiest port in the nation for moving military cargo, so part of my role is to go to the Ports of Beaumont, Port Arthur and Corpus Christi to work with the ports there to make sure that they can still handle military equipment so if another war happens they can ramp up within 48 hours and give us property on their port for us to move the cargo. So that's part of my role and other gateway directors around the country.

I'm going to talk about marine highways in a second. I think I have a better slide that will show that picture a little bit better, but StrongPorts is just kind of the code word for finding ways to finance ports because the ports really don't get much money compared to other transportation modes so the only way they can get grant money is to compete for them and it's very difficult. I think in the last round of TIGER grants that people asked for -- I don't know, maybe $5 billion worth of stuff. We were only able to give out $500 million and only ten percent of that went to ports. So the ports have to really struggle to get competitive grants and so we try to help the ports in our territory to try to compete more effectively for grants.

One thing that the Maritime Administration is doing is Congress had told us that we have to create a National Maritime Strategy. That hasn't been done before so the Maritime Administration -- we actually held a couple of forums up there at our headquarters in Washington symposium with over 400 people come to talk about how we are going to create a National Maritime Strategy and the current draft is in federal government review and then as soon as the final draft gets published in the Federal Register there'll be a period for public comment till we create an actual maritime strategy for the United States and one thing that was important about that, when everyone got together we thought some of the concerns might be Jones Act or other issues would be the highest priority for those people, but the number one priority was ports and the importance of ports to our nation's economy.

And you can see an integration of waterways into surface transportation. One thing that I always tell people when I travel around, whenever you see a truck on the highway with a container on the back of it, there's a good chance it's either coming from or going to a port. Most people don't really seem to realize that but that's so -- you see the maritime transportation industry every day when you're on the highway next to a truck.

The port channel, like I mentioned earlier, the growing population. It's going to be 400 million by a little past 2050, so how are we going to handle that increased population with our over constricted ports? Just last year the AAPA conducted a survey. It's a 28 billion in freight network needs for some of our ports. Intermodal connectors, that's containers going onto truck or to rail. Gateway Project, Marine Highway Projects.

You can just see there's so many billions and billions of needs around the country but that bottom line there shows that out of 35 TIGER projects for ports they've only gotten 1.9, so they've gotten five percent basically of what they've needed through the TIGER grant program. Very competitive.

Just recently though there is another

round of discretionary financing for ports coming up, the FAST Act. Now ports -- the new grants are called FAST lane grants. It's the same -- it's like a TIGER grant but ports can now apply for a FAST lane grant with a freight emphasis. The FAST Act was created with a freight emphasis so if the port can show that they are a nationally or regionally significant freight project then they can do a FAST lane application too. One other program up at our DOT Headquarters is called the Build America Transportation Investment Center that is kind of another kind of one stop shop. If you are -- if you need a rail project maybe we can help you get a rail infrastructure -- it's an RRIF loan, the Department of Transportation can help you with that.

If you just need a regular loan program, TIFIA loans are available. I forget what TIFIA stands for but it's a very -- it's a government secured loan with a very low interest rate so if you need some loan financing you can contact the BATIC. You can see if maybe you can get a TIFIA loan or railroad loan or more information on the FAST lane grants and on the TIGER grant. So, that's kind of a one stop shop for financing that we created recently at the Department of Transportation.

Just in my area we've given 48,000,000 TIGER grants over the past five years. Too Corpus Christi is -- was a rail project, Port of Houston of Brownsville was a dock project and Catoosa was a dock rehab project, Catoosa up there in Tulsa that I mentioned earlier. The TIGER grant applications for this year are being received right now. There's 500 million available.

One other way that we can help ports is through the Port Conveyance Program. If there is some federal property or land that's not being effectively used we can get -- and we become aware of it at the Maritime Administration, we can give that property to ports for free. Over here in Orange not too long ago we had a dry dock you know the vessels come in, the sinks and they do repairs on the vessel but we gave a dry dock to Gulf Copper over there and their business is booming because we were able to give them that formally just federal property just sitting there not being productive.

So, we have a Port Conveyance Program, we're always looking to help our ports by finding something they might need and this year there is another project, grant project. I wonder if I have a picture here of that. Sorry for zipping through but that bottom left picture there that's an operator here in the Houston-Baytown area. That is a tug boat pushing a barge filled with containers. He's been booming his business every year. He's now moving about 3,000 containers. So, that's 3,000 less trucks on the road and less air emissions, less congestion. So, the Marine Highway Grant project that I talked about -- so if you want to have, if you want to establish or help establish a route between two port cities instead of like trucks coming in from the Port of Houston and driving over to Corpus Christi to serve the population there because Houston is the main container port, they can be put on barges to go over there. So, this is one thing that we're -- of high priority of the Maritime Administration.

This year Congress did give us $5 million in marine highway grant money. So any, so we're hoping we get more of these projects started around the country. We also in conjunction with the AAPA, American Association of Port Authorities, we created a planning and investment tool kit. It's a book that's kind of like the same thing, kind of a one stop shop for types of financing, planning and investing, planning processes and investment processes for ports.

So, like I said our main goal through all of these projects is to try to help ports find a way to finance their project especially here in Texas, the state government does not give the ports money. Other states like Florida, Georgia, South Carolina they give their ports hundreds of millions of dollars every year out of the state budget but Texas doesn't do that. Texas is kind of your private industry do it yourself. So, we're hoping to help our ports here in Texas and around the country to get financing if they can't get it through the legislative process.

I mentioned the Marine Highway Program. We have -- these are designated routes around the United States, those green lines there. So if you want to -- if you want to operate a service on one of those green lines, like say from Charlotte to Miami, you're on the M-95 so that makes you eligible for Marine Highway Project money.

So, like I said we had to create a little one here in Texas for that, I mentioned that guy that's doing about 3,000 containers a month because it wasn't quite on the Intracoastal Waterway, so we had to get the route designated first as the M-146 and now he's eligible for Marine Highway money. It's just kind of a bureaucratic thing we had to do in order to make them eligible.

Okay, I mentioned there's just a picture of trucks lined up outside a port, you know waiting to come in, you can just see how bad it would be if the container numbers are going to double in 20 years. People think it's bad now, it would be much worse. We still only move less than five percent of our freight by water throughout the country while other counties, Europe and China they do it a lot more. That's just because of our history. We're a truck country, we're a rail country but there are a lot of opportunities to move cargo by water that we feel -- that can be taken care of, can be assisted with our help and other federal grant money.

We do have the -- let me see if I have this, I mentioned another part of our national security role, we maintain ships around the country that are ready at a moment's notice to carry equipment and men if a war occurs. So, you saw in that one sheet where it said there are a couple hundred people that work in the fleet maintenance areas.

These are some of the major fleeting areas around the United States; the one in Houston is no longer here, they moved to Beaumont, but these ships are maintained, some of them are maintained you know like a 48 hour readiness status. They're fully manned, fully fueled, can be out the port in 48 hours. Others are a week or two week status but if a national emergency happened in Korea those ships on the West Coast could get activated and get underway with just a couple of days and these are all MARAD owned ships that we would give to the services if they needed to move their equipment around the country or around the world.

There's just a couple of photos from the ships that we do maintain at the Maritime Administration. They not just used for wars, too when they had the earthquake in Haiti we activated a lot of our ships and they went down to Haiti carrying cargo and goods down there because they were so devastated, you couldn't use the airport and this is a way to get a lot of equipment there soon. And we even use -- in the Port of Beaumont they use one of our ships, if a hurricane is heading for Beaumont, they put some ambulances and fire trucks and other things onboard one of our ships there in the harbor so as soon as the hurricane passes they can put the ramp down and go help the people in the downtown area instead of you if they go outside the area it might be a day or two before they were able to get in and actually drive around the inner part of the city. So, we assist the Port of Beaumont if a hurricane is coming that way.

This is my information, like I said I'm based in Houston and if you need anything I'm at Brian.P.Hill@dot.gov, and if you need any information about BATIC or the federal financing -- one thing I did want to mention real quickly, I forgot. If you do get a grant normally there is a 20 percent or 25 percent matching requirement and this relates to navigation. You can use dredging as your match so, if you get $10 million to build a dock and you have to spend $2 million in matching funds you can spend that two million on dredging dollars. So, that's one way we can assist navigation in the Texas area.

MR. AALUND: Thank you Brian, great job. Our next speaker is Captain Bill Diehl, US Coast Guard retired. He's the president of the Greater Houston Port Bureau. His presentation will be Uniform Standards Database for Port Information. The Greater Houston Port Bureau is a maritime organization that supplies its 200 member companies with detailed vessel traffic information and maritime expertise in safety, security and environmental issues. The Bureau under Captain Diehl's leadership has also been instrumental in representing its members in front of state and federal legislators. Before coming to the Port Bureau, Bill served 31 years in the US Coast Guard in a variety of positions including serving in an assignment at the Panama Canal. Bill has a high profile and an active role on many regional committees and workgroups. Please help me welcome Captain Bill Diehl.

CAPT. DIEHL: Good afternoon. I'm going to talk to you about information. Basically we do -- we're counterpart to Marine Exchange, there's 14 Marine Exchange around the coast and we're tracking ships and using that information to improve the efficiency in our ports. So I'm going to talk to you about some of what we do on that.

I guess it comes up a little clearer on the screen. We're about information, we track all the ships. Our, basically as I said, our franchise is Texas from Beaumont down to Brownsville so we track the ships moving in and out of Texas and then we take that information and push it out to people who can use it to improve efficiency.

We're overseen by a board of 33 industry members. They get together once a month and they give us direction on what to do and then we form some committees to work on those things. One of the sub-committees that has been very active for us in the last year is Traffic Committee which has been looking at how to make the port more efficient. We've taken our information, we sort of drilled down to what is the time to each dock, what is the time to tie up, what is the time -- how many laborers, all that type of information to try to figure out efficiency in the port and how to push that forward into measurable things that we can do to improve the efficiency of the port.

What I'm here to talk to you today about is a global effort that we're involved in. We became part of the Avanti Group Effort. This is a program that was spearheaded by the four companies you see there, CMA, CGM, Vopak, Shell, and Maersk and they got together and they said hey, we're moving around these ports and why can't we sync up what happens in each port because every time we move into a port we're looking at different information and how does that work. So, they approached the ports. You can see the ports that are the four main ones that are involved in it right now, Rotterdam, Houston, Singapore, and Gothenburg, Sweden and so, we are working on this and I wanted to just go over with you what this is.

The first step of it really is to get everyone talking on the same language. Basically, from regulations to description of current conditions in the port, we realize that you leave one port and then you go to the next port and the captain's got to figure out is he going to be able to move his cargo or ship in and out of that port efficiently. So, we're starting to talk among the ports. We -- they give us their definition of what something is and we scrub it through our port to see if we agree.

This is kind of small writing but for example, and I don't know if you can see that well but, let's say draft, so the draft here in Houston's 45 feet, the draft in Savannah is 48 feet are we talking mean low or low water, are we talking mean low water in each case and then okay, are we then for Houston it's 45 feet all you need to be to come in, because we have a soft bottom and the pilots are ready to go at 45 feet but in the Port of Savannah the 45 feet is you have to have a three foot under keel clearance to get in there too or four foot I think it is actually four foot.

So, that type of information is valuable when we're going into a global market so our approach here really is as simple as if we're going to grow locally we've got to look globally to match up efficiency from our port to the other major port. So, when they come in they know exactly with, as Brian had mentioned, predictable what's going to go on there and how it's going to flow and then they'll be able to make a business decision on whether they can make money moving that ship in and out of the port.

This is kind of what it looks like. It's right now a very static program in that you basically click on it and it brings up the port and I can look into the port and I can tell okay, what are the depths, what are the -- even down to what are the holidays there, what are going to be their work hours, what is the MARSEC level there, how does all that work, where are all the phone numbers, how do all this kind of inner relate.

It's really putting our information into these databases so that when you move from port to port you have a system that has been vetted by the port and said this is how we're going to operate information wise and you can see why having the same information is important because when I look in there and I say okay, I want enter time to arrival is that at the sea buoy or at the dock and that we're all using the same terms, so that's the step we're at.

This is what it looks like right now. Go back one. So, basically what you do is you would put your information in and basically the program would tell you okay, you're good to go all the way up until the dock, so I guess you're not going to that dock. But, that might be something at that dock at that moment which we use a lot here in our program that we have through the pilots. The pilots here are very generous with their dispatch information and our Harbor Lights Program and that's up to date all the time.

But, we're doing the same type thing which you can see how when you are scheduling your ship to move you can enter in your information and it can tell you whether, let the computer do a little bit of thinking for you to make sure that you're good to go when you head into the port.

This, as I said, is a static program. The goal is to move into Pronto, which is more of a dynamic program that we're going to develop after we get the vocabulary straight and our basics of here's how it works in this port and here's how it works in your port and we agree that what we're saying is the same then we're going to move into a more dynamic and this is something that we already have here in Houston through Harbor Lights, what I had mentioned earlier with the pilots giving us their dispatch information, we know when the ships are going to move and where they're going. Basically, then can prioritize.

It's kind of like the flat screen TV that you see at the airport, we do that right now through the pilots giving us their dispatch information and that's what they're trying to do here but only on a bigger scale to where not only when the ship moves but how the cargo, all the way through the logistic change, so I'll be able to tell on this thing is not only when the pilots are going to move the ships but are the cranes going to be available when I get to the dock to transfer that cargo and the amount of cargo I'm going to want to transfer, is the trucking and all that going to line up. So, it's a very dynamic program, this one is, and this is a ways out for us but this is the next step where we want to go.

That's really all I wanted to share with you on you know, the effort we're making to go global between ports because we figure our efficiency is key to the efficiency of our partner ports out there and how they move in and out of our ports.

So, one of the things about going global though is also these relationships with the other ports has allowed us to look at things such as LNG bunkering, green initiatives and things like that that say okay, what are you doing, how are you doing this and trying to get ahead with these partner port things and so we found good collateral things that come out of just trying to get this discussion going with terminology of what's in our port, what's in your port and then with the idea of okay, how do we move our cargos globally faster through predictability in ports.

As we said you know what they really want is predictability, they don't really care if it's two to four hours, they make money at two hours, they don't make money at four hours. They want to know is it two or four and then they'll make the decision whether to sail into your port or not, and they're not negative about it, they just want to know upfront. But, if you tell them two hours and you deliver four they're not going to want to come back to your port. So, that's the idea is to be very predictable on how much, how long it's going to take and what are the details of your regulations and how information moves.

MR. AALUND: Thank you Bill.

CAPT. DIEHL: No problem.

MR. AALUND: Great presentation. Our next speaker is Captain George Pontikos. He is Vice-President Port Operations for Odfjell USA. He's going to make a presentation on a very important committee here; it's called Lone Star Harbor Safety Committee. Captain Pontikos is Vice-Chair of the 35 member Lone Star Harbor Safety Committee which provide US Coast Guard supportive forum to address MPS issues regarding navigation, safety related matters in the Houston, Galveston, Texas City and Freeport areas. Captain Pontikos graduated from the Greek Maritime Marine Academy and has sailed on various types of ships from bulk carriers to general cargo containers, lumber timber carriers to crude oil product and chemical tankers. George you've done everything except the cruises right?

CAPT. PONTIKOS: Yes, I have been a passenger on a cruise vessel.

MR. AALUND: His current position is Vice-Chairman for Operations with Odfjell, the leading company in the global market for transportation and storage of bulk liquid chemicals, acids, edible oils and other special products. Captain Pontikos has participated in various industry organizations and working groups including, and you need to update your profile it says here HOGANSAC but its Lone Star HSC, the Greater Houston Port Bureau, Chemical Transportation Advisory Committee, Intertanko and is currently chairman of my group, West Gulf Maritime Association. Please help me welcome Captain George Pontikos.

CAPT. PONTIKOS: Thank you Neils. On a personal note I used to sail as a deck officer and captain during the second half of the 70's and 80's and some part of the 90's and the electronic equipment back then was just a gyrocompass that aid us from the Second World War and radio directional finder. So my dreams and actually thousands of other seafarers dreams of getting electronic charts integrated with Global Positioning Systems and AIS became reality thanks to NOAA and other agencies and the technology.

I have spent an enormous amount of time correcting charts and have additional publications so I will thank you for providing the weekly updates electronically now and I have to admit our vessels have 24/7 internet access so that will be extremely helpful for the item that you mentioned earlier.

It is my honor to address your Panel today. As Neils mentioned I am in charge of the operations in US gov of Odfell, a regional company, focused on transporting and storing chemical cargos, actually anything liquid and some gas except crude oil in bulk.

I'm here representing though the Lone Star Harbor Safety Committee where I represent the chemical tanker owners and I am the Vice-Chair of the committee for the next couple of years. The committee was chartered in 2012 and is the continuation of the work that was done previously in the Houston/Galveston Navigational Safety Advisory Committee or HOGANSAC as many people know, the charter of which unfortunately never renewed after 2008 or so.

The scope obviously of the Lone Star Harbor Safety Committee is the safety and security of our area and I would -- well unfortunately doesn't so well, but I would like to mention a little bit about the members of this committee. In addition to the Maritime Administration the four federal agencies that Captain Penoyer mentioned in the morning, US Coast Guard, CBB, the US Army Corps of Engineers and of course NOAA are participating, thank you Mr. Bunn for your strong participation.

In addition, there are four port authorities; Houston, Texas City, Galveston and Freeport. The three Pilot Associations, Houston, Galveston, Texas City and Freeport are Brazos Pilots and of course the normal maritime industry that anybody can anticipate, tug boats, line handlers et cetera, but I would like also to emphasize Brownwater, GICA is member, Gulf Intracostal Waterways Association are members of the Safety Committee and of course the recreational boaters. Very strong participation by Phillip who is also here today and our area is fourth in the country, the fourth largest recreational boaters area in the whole country.

This is just an example of a resolution that the Safety Committee signed a couple of years ago and sent it to the Army Corps of Engineers in Washington regarding the Bayport flare for those that are from this area know the program. And of course, as you probably know the actual work of the committee is done through the sub-committees and their working groups. So one of the sub-committees is the Waterways Utilization chaired by Captain Plunkett and it's dedicated to safety, security and efficiency of our ports.

As it has been mentioned before, this port complex is one of the most challenging, as a matter of fact in the world, the combined Houston, Texas City, Galveston and Freeport. The working groups, we have a working group that actually NOAA and Mr. Bunn participated very heavily for the expansion of the anchorage in the area that unfortunately we don't have that much area and it's much needed. The Chemical Tankers Scheduling Optimization Working Group that we are looking for the efficiency of the chemical vessels in the area that they have to call 15, 20 different docks.

We have the Refuge and Response Working Group a part of international accidents that have occurred in Europe and Asia and ships requiring refuge. Actually, last year we had a similar event where an accident happened here in Houston and basically the vessel needed some kind of refuge and response.

The next sub-committee that we have is the Navigation Operations Sub-committee or NavOps. Again, the objective is to improve the safety of the operations in the Houston ship channel and the surrounding area and it's also the sub-committee that brings together the brown and blue water vessels and operators with a variety of working groups, facility working groups that again, brings together the facilities operators with the ships and barge operators. The Brownwater University, the blue and brown water interface, barge fleeting and movements, casualty analysis in general whenever we have an incident or an accident we do the analysis of it and lessons learned passed on.

A sub-group is the menhaden that I don't know if you are familiar, menhaden is a very small fish that unfortunately blocks the filters of the pulling water of the ships and the ships lose power in the middle of the channel. During the last few years we hit spikes on this event and we have this working group that brings the whole knowledge to the group and we try to avoid these incidents and hopefully we will have zero for this year.

I would like to talk a little bit about the Vessel Traffic Services. The director of it is present in the audience today, Captain Nerheim, and the accomplishment that the Vessel Traffic Services has done. First of all, I can mention some numbers; there are 280,000 ship movements a year in this area, the VTS area. I repeat the number, 280,000, its 23,000 ships, 140,000 tow, tugs and tow, 109,000 ferries, total again 280,000 a year and we have incident through transit ratio is about five to 10,000. Every 10,000 transits we have five incidents. That doesn't mean big accidents, it's any incident and we are very proud of it and proud of course for the Vessel Traffic Service.

Accomplishments, the re-design of the chart for geographic sectors so that barges will, will be on their own lanes, Category I and Category II Channel Obstruction Closures and others but I would like to emphasize on the Port Coordination Team, the VTS, the Vessel Traffic Services in this area is sponsoring the Port Coordination Team which again, has members from everybody in the industry and convenes either after a sudden closure of the channel, if it is fog or an accident, or even before when it is a hurricane, something that is expected in the near future and I will talk a little bit about Hurricane Ike in the next slide. Brownwater University again very important for our area brings together the blue water and the brown water people together and educate the brown water users on handling the tows and the barges.

The next sub-committee is the Dredging and Marine Construction Sub-committee. I would like to emphasize here for those that are not from this area, in addition to everything else that we know about the water movements, hydrodynamics, temperature, pressure, currents et cetera, we have here movement of the bottom of the sea. It's very soft mud bottom and it moves constantly so the dredging is extremely important in our area. Obviously we work together with the Army Corps of Engineers very heavily there, communicate with VTS and pilots and Port Authorities.

And the last sub-committee is the Training and Outreach and I have this slide specifically because this is Hurricane Ike in 2008, the track and it was a hurricane that hit directly the Galveston and Houston area. Captain Bill Diehl was the captain of the port at that time. We pretty much expected the hurricane so we did a lot of preparation. We evacuated the port. Captain Diehl had to save some 150 lives from Boulevard Peninsula just a couple of days before the hurricane hit the area.

It was a kind of unique hurricane because it wasn't -- well we were expecting to be strong but it wasn't that strong in regards to winds but the surge was pretty strong, it was Category IV on the spread -- on the surge side and Category II on the winds. Anyway, we worked very well together. Well, at the time it wasn't Lone Star Harbor Safety Committee it was HOGANSAC and VTS but we worked very closely together to evacuate the port to make sure that the vessels that couldn't evacuate stayed in the port safely.

We had to monitor the area during the storm and of course as always, something happens, some incidents happened and we had to take care of this incident. Captain Moore is actually here to warn the ship that was ready to hit bridge and then of course to restore the port after the hurricane and that is extremely important for the vessel, I mean for the Port Coordination Team, extremely important how to restore the port and NOAA, both on the weather side and the navigation and hydrographic side was extremely, extremely important, thank you again Mr. Bunn.

MR. AALUND: Thank you George. Well it looks like we're -- great job. We're doing well on our timing now we can go back to Captain Sherri Hickman. I gave her an introduction earlier so I don't think we need to repeat that. She's kicking me not to do that. But, you guys in the back -- can you run that video for us, sir? While they're getting that ready, you guys did a super job so far on our presenters and I think that we're going to have ample time for Q&A. Gary mentioned that we have cards that we can rotate around. I don't know if we have to be too formal but, so either ask the question directly or pass a card to somebody, we can do that. We got a microphone, too. It looks like the video is about to start.

(Video played.)

CAPT. HICKMAN: Well, maybe it was a blessing in disguise that that was last. Now you're awake, and it quantifies really what the other panelists were saying, what they deal with on a daily basis with scheduling and whatnot. But what does this mean to you as panelists? Since the beginning of this Panel, it's always been one of the subjects or topics has been the PORTS Program and that's the Physical Oceanographic Real Time System. I'll never stop talking about it, the Panel probably won't. But, regardless of the congestion, regardless of the size of the ships, we're bringing in 1,200 foot-long ships now. Some of them not that length but some of the widest we're bringing in are 156 feet wide with a 45 foot draft coming through that channel and I carry a computer with -- a Raven Computer. On our computer is NOAA S57 charts that we are able to update all the time.

I can see vessels via the AIS plug on the ship as well as through my own computer and our SEND Client software that Raven provides for us. But every day that I'm on that channel, I don't move that ship without pulling up the PORTS Program and looking at the real time water level, currents and that plays a part on where I'm going to meet somebody because of the way the current might set me. If, I don't know if you really realize that we have one buoy that we monitor at Morgan's Point, and that was in one of the -- was it, Peter in your slide -- we won't move a ship if that buoy reads -- if it reads zero we'll move a 45 foot vessel. If it's minus one because the wind is blowing out of the north, we will not move a 45 foot draft vessel. We will move a 44 foot draft vessel if it's minus one. So we rely on that every single day 24 hours a day for information on the water level at Morgan's Point to move those deeper draft vessels. Sometimes it's minus two, it's rare but then we won't move a ship with more than 43 feet of draft, so it is a critical information and input for us. It is always, I mean I think 22 ports now have the PORTS system. I know there's more that want it. It's always been a discussion of who's going to fund it and it will always be a discussion of who's going to fund, it but that information that we get is extremely critical, and we wouldn't be operating without that information.

For those of you on the Panel that will be joining us on one of two of the pilot boats you'll be able to see the AIS in real time, and I can show you how I look up that information with just a click of a button on my computer and how invaluable the information is to us as pilots, whether it's Houston or Galveston, it's invaluable so -- for those of you that will be joining us, that'll be great for you to see that in real time on hands. For those of you as guests, I'm sorry. But, I think I'll turn it over to Neils now for any questions.

MR. AALUND: Thank you very much. We have two cards come in and I see some more coming up, but Captain Peter Simons had a card followed by Commander Brian Hill so if you guys could queue up and maybe read your question and answer it for us please?

MR. SIMONS: The question is whether I would support using user fees to fund PORTS, and I think to some extent obviously we already do that right, the local sponsor is responsible for the cost of acquisition and installation and then operations and maintenance, so I think we're already there. I think there ought to be a cost share between the federal government and the local sponsor. I think the local sponsor should continue to contribute towards the cost of -- I think it ought to be on the acquisition, the expansion side of the system but should continue to contribute towards the cost of the PORTS System itself.

Perhaps, you know, as I advocated a study for example. Perhaps, as we do with the Corps of Engineers we share the cost of that study with the cost of implementation, based upon some sort of formula in the future. So, I think today we already pay; well, clearly, today we already pay for that. I would be concerned from a tax standpoint that we, we run the risk of developing a harbor maintenance trust fund scenario where you contribute monies and then need to work with Congress to make sure those funds get returned to the individual harbor.

So, I think a system, a hybrid of the system that we've got today with a local sponsor being responsible for, again, I think it's on the acquisition and installation side, and NOAA being responsible obviously with, with proper funding from Congress, and that's on us as mariners on us as port authorities to work with our congressional representatives to try to slow that train down, but NOAA being responsible for operations and maintenance really is the right scenario.

MR. HILL: Thanks. I've got a question that I can't really answer too well. The Department of Transportation created an advisory committee; it's called the MTSNAC, which is Maritime Transportation National Advisory Council to advise the Department of Transportation on maritime issues. So one of the questions was do I attend? No I am not a -- I've been there once just as a guest. Twice a year, they bring us Gateway directors up to headquarters for two weeks, so it just happened during one of my two weeks the committee met, so I was -- just sat in as a guest. There's members from federal, state, local industry, labor, ports they all get together to act on an advisory role to the Department of Transportation.

So, another question was were there any best practices of MTSNAC that this group might be able to implement, so I'll talk with the people at my headquarters to see if they have any suggestions on that and whether -- there are 29 people on that committee so another question was do you think that a 29 person council is that effective, so obviously I'll have to follow up on that one with my headquarters later.

And then I did get a question about the tool kit, about return on investment on surveys. Is there an identified return on investment when somebody does surveys, and I tried to e-mail that to the tool kit creator but I haven't got an answer back on that. So if you want to come up with me later, if you wrote this question, I'll go ahead and get those answers to you once I get something from my headquarters.

MR. AALUND: Thank you Brian. I have a number of questions here, one is for you, Brian. I'll pass it. You think about it and I'll go to Captain Diehl. Bill, the question that we have here does the port info effort you're talking about align with other international efforts, i.e., MONALISA Sea Traffic Management, S100 et cetera?

CAPT. DIEHL: I don't know that, because we were approached by the companies and asked us -- they were going to sponsor it and they wanted to have control of it so I don't know if they've synced it up but I think that, long term, that's what they would want to do. But, I don't have an answer to that.

MR. AALUND: Follow-up question for you Bill. Describe a common operating picture for management transit to port facilities. Is there any interest from other users such as AWO, GICA, et cetera? I think you hit on that a little bit in your presentation but maybe some more elaboration?

CAPT. DIEHL: Say the first part again.

MR. AALUND: Okay, describe a common operating picture for management transit to port facilities.

CAPT. DIEHL: Well, information is key on whether you're going to move, and so I'll talk about our program that we use here locally, the dynamic one which is Harbor Lights, which is -- we take the Houston pilots and the other pilot organizations information; it's fed into a program that then is transmitted on the internet.

So let's say a ship is coming in, and you're going to hire stevedores or whatever and that ship, for some reason, when the pilot boards, it has a main engine issue or something, the pilots will move to the next ship.

Meanwhile, the agent is thinking that that ship is going to show up at 12, and he's hired $20,000.00 of stevedoring work to do that. That can be cancelled immediately, and it's all basically spread out through the port. Or, let's say, weather comes in for some reason, you can imagine the port our size where we have 300,000 people working in it, it shuts down for fog. Use the same flat screen analogy at the airport.

When the weather lifts, what is the order of those ships and where, and basically, so that is transmitted by the program, so you don't have 20,000 people calling the pilot dispatch office saying, when are you going to move my ship. It's displayed on the screen and they all know the order it's going to happen. That also can be displayed if the pilots and the port has to basically react to priority of the ship. Obviously, in a case of weather and stuff like that and we have a container, or I mean a cruise ship waiting outside, we'll probably bump that to the front of the list so that we can get it in there, and there's other priorities that go on.

So, I think having information that is reliable and accurate, and telling you what's going to happen is very valuable. One of the other things we're doing, and I'm kind of hijacking this question I guess but, one of the other things we're doing is we are putting AIS on the International Space Station this year, too, and if you're interested in getting that data we would like to give it to you for a year for free. And our business plan, really, is to have you go out and figure out a way to make money off it, and then we will charge you a percentage of that money as a business model.

But basically, what we want to do is move our information from the window we have now, which is four or five hours when the pilots say they're going to move to even further out. So you can imagine this was an idea we had at the Panama Canal.

The Panama Canal knows what's going to happen that day. They don't know what's going to happen two days from now, and to optimize to the next level, you want to know that. So, if you can see the ship in the middle of the Pacific that says it's going to be there on Thursday that's not going to be there on Thursday, you don't put it in the scheduling queue. You optimize your program, you run that on Wednesday night with the ships that you know that are going to transit the ship the next day, and so by going to -- we were experimenting with six satellites out of Japan for the last couple of years. We didn't get the return that we had wanted, but we think that the International Space Station, because of its lower orbit, will give us a better read on the AIS. So, if you're interested in that, let me know. We'll sign a non-disclosure agreement with you and we'll give you the information, and you see how we can move ships more effectively in the world.

MR. AALUND: Thank you, Bill. Brian, you had a question. Would you read it for us?

MR. HILL: The question is how does the Marine Highway Designation benefit an inland port like Catoosa in Oklahoma? It benefits them in one way -- in order for you to be eligible for a Marine Highway Grant, you have to show that you are operating on a previously designated route. So already, Catoosa is on the M-40, which basically goes from Tulsa over to the Mississippi River. So if any operator wants to start a Marine Highway Service, a container on barge service, on that route, now they can.

So, if the Port of Catoosa found a container on barge operator that wants to operate, they come to us and ask that that route -- now that the route has been designated, they want to -- identify the two cities that they want to operate between, and then that makes them eligible to get Marine Highway Grant dollars.

This year, like I said, in the budget for the first time in three years, there are Marine Highway Grant dollars. So, if you're already on the designated route, you can now submit a request for Marine Highway Grant. So, that's the benefit to ports like Catoosa, why they went through the process of getting that route designated, is that they would be eligible for Marine Highway Grants.

CHAIR PERKINS: Can I do a follow-up on that question please?

MR. HILL: Yes.

CHAIR PERKINS: Could they use those grant dollars then for surveys or for dredging, or is it only for infrastructure improvements?

MR. HILL: I think, I'm 90 percent, I can clarify but generally, it's for equipment, dock work, cranes. That's what it's been used for in the past, to retrofit barges so they can handle containers onboard it. I'm not sure about a survey question, that's a good question. I can find out.

CHAIR PERKINS: If you could find a way to follow up on that I think that would be of interest.

MR. HILL: Okay.

CHAIR PERKINS: To me at least.

MR. AALUND: Thank you very much. I've got a question here for Bill Diehl and George Pontikos. I'll pass them down so you can be formulating your answers and so while that's being done, I'd like to call on Captain Hickman, Sherri. The two questions I have are how important is the recreational boating in this region, and also how important is commercial fishing, i.e., shrimping, et cetera, in this region?

CAPT. HICKMAN: I can do both on the same boat. Well, actually the port, before the dredging went into effect, most recent dredging anyway, I don't mean back in the day when they opened it but, they questioned the users. And the recreational boaters wanted Redfish Island rebuilt with some of the dredge material so that they had a place to go, and actually moor their boats without our wakes knocking them over while they're trying to, you know, sleep onboard at anchor or whatnot. So that was one of the things granted by the board to the boaters -- the recreational boaters.

The environmentalists wanted the beneficial sites which I believe, if I'm not correct, and somebody else in room might know better than I do, about 4,600 acres of beneficial sites for birds. Alan do you know if it was more than that, no?

No, okay. So, the recreational boaters, I'm not so sure -- Susan if, I know they are very -- they're integral to say the ports they're going into. We have very large marinas here, but I wouldn't say to the bay. They use the bay but to get to the bay, they're going through these marinas and whatnot. So the marinas that house them are the ones that, you know, need them there.

And then fishing. Fishing is an extremely large business here, during season anyway. And actually, that's one of our biggest fears when we find ourselves navigating, and it becomes foggy. They do not carry AIS, so we can't find them on our computer. We have to be in the radar looking for a blip here and there to find them, but it's their livelihood and it is big business in this bay.

MR. AALUND: Thank you Sherri. Let's go with reverse order. George, you haven't had a chance to speak and this is an important debate here we're having on national TV, so we have to have equal time.

CAPT. PONTIKOS: Well the question is, in your role with the Lone Star Harbor Safety Committee, what are the primary challenges you deal with regarding recreational boaters -- and actually, the representative of the recreational boaters here in this area is here in the room. In my view, and he will correct me if I'm wrong, there are two types of boaters. The one type is they don't care about anything. They just go onboard their ship, I mean their boat, and they go out to have fun, and they don't monitor what is happening around them, they don't know regulations, they don't follow anything.

The other group is actually the opposite, is the ones that they want to go out, be prepared, having all the information that they need to have in order to go out and either know in advance what is happening -- is there a dredging happening, is there a buoy that is missing or anything abnormal, and being proactive. So this group needs the information easily accessible and now, like you know like the Google Maps or whatever with the traffic on the roads.

For the other one, the challenge is how we will pass on to them if something is happening and we want them to be careful. The people that don't pay any attention, they just go onboard their boat, and they go out in the bay. We -- the challenge for us is how we will alert them that something is going on, and they need to pay attention to that. It is a work in progress. Phillip, do you have any comment? Well, I learned it from you.

MR. AALUND: Okay, I'm counting no less than four questions, so if the panel moderators can kind of be concise with two minute answers or less, we can get through a lot of these important questions. Bill, you had a question somebody passed to you?

CAPT. DIEHL: The question was how do you intend to maintain the data updates and the web service and we will monetize it by users. So basically, the four companies, right now, that are seeing if this is efficient, that were listed on the slide, are paying for it right now. Basically, when it goes to full scale effort, then, if you want to be part of it, you will pay into it, and that will be monetized by users.

MR. AALUND: Thank you, Bill. Sherri, you had a couple of follow up -- three in fact, so --

CAPT. HICKMAN: Yep. How long is a transit from sea buoy to furthest up the channel, deep water drop berth? Transit is 56 miles, however, there are cutoff points for certain draft. We can't take 45 feet all the way to the furthest dock up; we take 36 feet up to the furthest dock. Shell, an oil tank -- and is where we cut off our 45 foot draft, and it goes to 40 feet from there. And then further up we go down to the 36 feet.

What happens when weather conditions change en route? A lot of variables there, depends on how much traffic I have opposing traffic, how good the radar is that I'm using -- because I can't rely only on my computer, because the computer will not tell me about some of the pleasure craft or the fishing vessels. So, if it -- and our only option is to go to anchor, either to finish the job if you, if everything else you feel comfortable with, but otherwise, the only option is to go to anchor and wait out the dissipation of the fog.

Would forecasting be valuable PORTS data? Could be, right now we do use weather stations. We actually subscribe to ImpactWeather, and they monitor the dew point, the air temperature, water temperature and historical data from previous -- like we have areas of the channel that will notoriously fog in before the rest. Why, I don't know, but George probably hates it because Bayport, the mouth of Bayport Channel is one that goes first all the time, and that's where most of the ships are, so -- but weather forecasting, we kind of get from, it's still from NOAA, but we do gather that from news and weather stations. Putting it on the computer, I don't know that that would, I'm not so sure that would be helpful for us, other than what we already have.

MR. AALUND: Thank you Sherri. I've got a question here that maybe anyone on the panel can raise their hand and try to answer. The question was curious about the future growth, what limits might there be and limitations on how these could be overcome, which is a million dollar question for this area, but would any of the panelists like to tackle that one? Looking at the phenomenal growth that we've had and the future growth, so forth?

CAPT. DIEHL: I'll talk about it, because it's one topic that's come up a lot with our chemical ship efficiency movement, and it was a lot of people saying the port is congested. And the port is not really congested for moving to an oil, you know, tanking dock or to a break bulk or bulk dock or anything like that. We do have massive inefficiency in moving our chemical ships through the port, and that has to do with the way the cargo is handled on the ships. So, when the chemical ship shows up, it says to the seven terminals that it's got to deliver 20 chemicals spread out. Here's your notice of readiness. Your cargo is here. Those seven terminals are getting ready for that chemical ship, and then it goes to one of them. The other six have just wasted time stripping lines, emptying a tank, and moving rail cars and then the process repeats again for the six other terminals that that ship has to go to.

So, what we did was we looked at it and we said what happens if we do a dedicated notice of arrival for these ships, and we got all the terminals to tell us their schedule. We already know the ship's movements through the Harbor Lights pilot program but we need to know what's going on shoreside. We ran two ships concurrent, they both had seven terminals they needed to go to, about 20 cargos each. And the one ship we said you do your blanket notice of readiness right now, and go through the port. They came out of the port 21 days later.

The other one, where we were massaging which terminal it went to and dedicated on scheduling it, came out of the port in 15 days. You can imagine that cost, as far as a single terminal told us that they would be able to bring in 100 more ships if we followed that in the port. So as our port grows, we have to grow in our cooperation. That's what we've learned all the way along and it's going to be even exacerbated more.

So, everyone wants to know what is your limitation? At the Panama Canal, I can tell you exactly what the count could go through in one day, because of the amount of water that flows through the locks. That's the limiting thing on how fast you can raise and lower the locks and how much can fit in each lock. In a port like ours, it's not that, and it's a lot larger, but we're going to run into inefficiencies first before we run into capacities of the -- what the channel can hold.

MR. AALUND: Thank you, Bill. Mr. Chair, we are at 1550. Can we have one or more questions or should we cut it off and open it for public comments?

CHAIR PERKINS: Go ahead.

MR. AALUND: Okay, this last question I'm looking at the panel and this is a question that if Captain Wally Hogan with GalTex or Captain Nerheim -- maybe Peter with the Port of Galveston, but the question is would you consider to adopt transit windows for cruise ships in low visibility conditions, thus avoiding small craft, uncontrolled traffic in critical areas, that's a conceptual idea.

MR. SIMONS: I definitely don't want to speak for Captain Hogan. I think, to some extent, we're seeing that today. As I mentioned in the presentation, we often are able to move cruise ships and other traffic into Galveston Harbor, when upriver is shut down because of reduced visibility. The challenge, though, as Sherri alluded to, is that recreational and principally commercial fishermen -- they operate in all types of weather conditions. And the entrance to Galveston Bay and, unfortunately, Galveston Harbor is a very popular commercial fishing location. And so from the standpoint both of the pilots and the cruise ship captains, that is an issue of concern.

We've talked about ways that they might minimize the risk associated with vessels which don't always appear on radar or smaller vessels that may be much more maneuverable obviously than the cruise ship but nevertheless, present a concern from the pilot's standpoint. I'll tell you, I think the pilots do a great job in moving cruise ships and again, reduced visibility conditions, but there is no panacea -- there are definitely risks any time you move a vessel, be it reduced visibility or not, and smaller vessels are one of those risks.

MR. AALUND: Very good. I don't -- Captain Hogan stepped out. Steve, do you care to add any comments on that -- okay fair enough. That concludes our Q&A portion. I'd like to ask for a round of applause for our presenters.

(Applause)

MR. AALUND: Thank you very much. This concludes this session.

CHAIR PERKINS: Excellent job moderating, by the way. We do now have the public comment period for today's meeting. So for those of you in attendance, a requirement is that you do utilize a microphone and state your full name so that it can be accurately captured in the record of the meeting. So, we'll now open the meeting to public comment.

MR. KROPF: First of all, I was very glad to see the representative on the Panel from BoatUS, Susan. I'm a 29 year member of BoatUS with unlimited towing on Galveston Bay, which you don't want to be without, for reasons I'll get to in a second. George Pontikos mentioned -- various of the local members or local people that have been here today know, I am the Recreational Boater Representative to our Area Maritime Security Committee. I've been that for about 10 years to our Lone Star Harbor Safety Committee to our area committee, which is environmental side of things and I am on the Port Coordination Team, even though I don't have too much to do there.

I'm a -- I sail a 27 foot sailboat on Galveston Bay, have been doing that for about 25 years. I'm a member of an organization called Texas Mariners Cruising Association. We've been around for about 35 years. We're the largest and definitely most active, and by most active, I mean, we actually go places in Galveston Bay almost on a weekly basis. We organize cruises and are out there on that bay trying to stay out of the way of the traffic, the ships and the fishermen and so on and so forth.

Galveston Bay is -- the complex is roughly 600 square miles, there's a little pamphlet that we have that we designed a few years ago called Sharing our Bay for boaters. We do have to share. In that, it mentions that less than two percent, probably closer to one percent is the amount of space that's taken up by the Houston Ship Channel on the other commercial channels, and we have 98 percent of it, which you would think we could stay out of the way, and we try to, or least some boaters try to. George talked about the people that are out there that sort of don't care or don't -- maybe they do care but don't know any better.

Galveston Bay also -- most of those 600 square miles, except for the Houston Ship Channel at 45 feet, is on a good day eight to ten feet deep. When I say on a good day, because as Sherri Hickman mentioned, when a Blue Norther goes through, here we can lose a foot of water, a foot and a half of water; the average tidal swing on Galveston Bay is maybe a foot and a half. Three times this winter, I know we've been at like plus two feet and within less than 24 hours, we were at minus two feet. Sherri talked about Morgan's Point and -- you know, when the PORTS meter there says a certain depth, they don't go there. I use PORTS all the time, and I'm glad to hear that I think each panel member mentioned that in their own way. I use the wind, I use the water depth, your most valuable instrument on Galveston Bay is probably your depth meter. My boat draft is four feet, but I have friends with six foot draft.

By the way, our TMCA Group is -- we're everything from dinghies to 60 foot yachts, both sail and power -- and probably -- I go places that other people won't go, because I am only a four foot draft, but we have people with six foot drafts and things like under-keel clearances were mentioned out there -- well if you're a six foot draft on a ten foot bay, that's not a lot when the water is down two feet. You're just skimming the bottom all the time.

I work closely with Alan Bunn, who has been mentioned several times and the Harbor Safety Committee about information on the charts, how information gets put on the charts. By the way, we have a monthly speaker at our meetings. I'm trying to get Alan lined up to come talk to us. We've also had Captain Diehl come talk to us on three occasions I think in the past. Captain Nerheim who was just here, all in the quest to educate recreational boaters. And we've had Sherri Hickman, I don't know if she remembers, you came and talked to us twice years ago -- Bob Webbon, who is in the video, came to us. Bob Webbon was a pilot is also a sailor, so he had a unique perspective and a couple of weeks from now, we have Sherri Taylor, I believe, who is a fairly new pilot coming to talk to us.

Anyhow, the issues for recreational boaters and at 98 percent of the bay that we go in, you look on a chart and here's all the depths and has markings and wrecks and so on and so forth. Some of which we know are not there, because they're artifacts. There is spoil areas shown on the charts that the -- ever since the deepening and the widening of a dozen years ago of the Houston Ship Channel, the spoil areas where the spoils use to be put are no longer put there, they are put in either beneficial use areas or in placement areas, and yet those spoil areas are still on the charts.

So those are various things that maybe could come off the chart. There is also things that sometimes don't get put on the charts. Sherri mentioned the rebuilding of Redfish Island and the creation of the Mid Bay Placement area. About eight years went by before those two items were charted, and I brought that up to Alan Bunn one day. He gave me the name of Steve Soherr in NOAA Charting, I guess. He said, send me a Google Earth image of these and within a month or so, a month and a half, they were put on the charts.

So we have big issues all the time as boaters are out there using the bay -- what's real, what's not real. We -- a couple years ago, three years ago we were able, through the efforts of some recreational boaters in the Texas GLO, to get some abandoned structures, and when I say structures these are old oil platforms, some of which have been destroyed by Ike, but they were still sitting out there, removed from the bay. And when I say removed, down ten feet below the mudline. I got with Alan afterwards; we got those structures removed within a short period of time really, relatively speaking. I said, Alan, how do we get these off the charts and he said that's a difficult -- that's a more difficult problem getting the structures removed. So that's an issue that I'd be happy to talk to anybody about.

We try to keep people out of the ship channel. Some boaters are going to go there anyhow. I have a couple of routes that I've sort of glazed on either side of the ship channel to get down here to Galveston, for example, but there's some areas that boaters are never going to take those routes because again, they see stuff on the charts that they're just not going to go there. I'm a little bit more daring or maybe foolhardy than some of them -- and again with a four foot draft I can get away with some things.

Those are some of the issues that recreational boaters in this area deal with and there are many of us. I think it was alluded to, we're the fourth biggest area on Clear Lake, which is half way between here and Houston. Roughly speaking, there's about 7,000 boats moored in the water. This doesn't count boats on trailers, probably half of them never leave their slips but the other -- some percentage of them on any given Saturday or Sunday, there's literally hundreds of boats out on the bay, mostly going around in circles because they don't go anywhere. They just daysail, but groups like ours, which go places. We're concerned about what the charts say and how we get accurate information. So, that's basically my spiel and I'd be happy to talk to anybody here over the next few days about any of these issues and how we improve charting for recreational boaters.

CHAIR PERKINS: Thank you. Do we have any other public comments that would like to go into the record?

RDML GLANG: Can we respond?

CHAIR PERKINS: Certainly.

RDML GLANG: Thank you Mr. Chair. Gerd Glang, Coast Survey. So, removing things from our nautical charts is really, really easy. It's not that hard. We only put things on when they come to us from an authoritative source and therefore, to remove them, we try to go back to the original authoritative source. So, it's really quite simple. I'm half joking, because things like removing spoil areas as an identification on the chart, we work closely with the Army Corps. They would have been the original authority on that, so some of the other examples, I'm drawing a blank right now on what you mentioned. Oh, getting the rigs removed. So when there's an obstruction like that, which is removed from the chart, the best thing, the most useful piece of information we need is documentation of the salvage operation. So pictures with GPS information and those kinds of things, that's proof to us that operation is complete.

A lot of times, there's still debris left on the sea floor, and then our cartographers out of abundance of caution, not having information that a survey was done of the sea floor and that all of the obstruction was truly removed will leave something there. So, that's what takes a while, then, is getting the opportunity to go back and maybe do a full area survey. So, it's really quite easy. It's the level of proof we need to take it off the chart.

I've been in this business a long time. There's lots of things on the chart I would love to take off and we just don't have the information to do it.

MR. KROPF: Just to respond to that, it's -- ten structures that we got removed in what we call -- structures project, TGLO, Texas General Land Office submitted the information and I know these were removed down, I think to ten feet below the mudline. I have noticed on the most recent chart that in the ten areas or nine areas where these were, the little black box which said platform or whatever is now a little open rectangle and it says -- I think it says ruins or something like that.

So I'm not quite sure that does exactly what we want it to do. If they're down ten feet below the mudline, they shouldn't be on there at all, I don't think. One of the other concerns I have regarding spoil areas and hazards, I believe Alan told us in a meeting a while back when I brought something up, we had somebody hit something in an area in the Clear Lake Channel that was a marked object. I don't know if it was a wreck symbol or whatever but in a spoil area and I believe the -- what I was told, correct me if I'm wrong Alan that spoil areas like that, which are no longer, used are coming off the chart.

If there's a hazard symbol within that spoil area, that hazard is also coming off the chart. Now that I think is something that we shouldn't be doing, because the hazard is still going to be there, whether it shows it as a spoil area or not. Again, I could be incorrect in what I interpreted, but if that's happening, then we don't want that to happen.

RDML GLANG: Yes, that shouldn't be happening by our nautical charting manual. Did you want to respond, John? I'm going to put the chief on the spot.

MR. KROPF: We can talk about it later. I think the important thing is that you found the right person and that you need to keep pushing Alan to follow up with us when something that you all had expected to happen didn't happen on the chart. So, I thank you for your attention to our charts. That's kind of the level of detail that we need at the local -- especially here in the local region. That's a challenge for us, thank you.

CHAIR PERKINS: Yes, go ahead Lindsay.

MEMBER GEE: Yes, Lindsay Gee. I just want to ask with the local, in the local area then, if people are using and sharing that information on chart blotters and the applications around, like Active Captain and those kind of things, are they using that -- so people, your recreational boaters or maybe the commercial fishermen sort of already have that in some area that they share that's not getting --

MR. KROPF: More and more boaters are using AIS. I have receive only AIS but a lot of, Sherri mentioned not being able to see recreational waters -- more and more boaters have transponders. Active Captain -- I'm a big proponent of. I have almost 700 points, every time you post something on a chart you get a point and I just posted something a week ago. Another issue that we have is -- you know, we got these ten structures removed. Just in the last three weeks I've had reports from other boaters of three incidents where pipes, flow line pipe -- the Galveston Bay is laced with these things, it went from platform to platform and they get drug up by oyster nets and -- shrimpers and oystermen when they're dragging the bottom, again the bottom is only ten feet down, and these things just appear like magic. We know those can't all be charted and getting them removed is a whole separate things, aside from, you know, what we're talking about here charting.

We do make use of Active Captain. I promote that a whole lot and I know NOAA is using the information on shoaling, I guess nationwide now, from Active Captain users, and I just think that's personally great. But the sophistication of some boaters, the ones that George was talking about that do care, they have lots of technology. My boat has two instruments that talk to each other for purposes of VSC; the technology is migrated down to all of it. So, my boat is too small and I'm too poor to afford some of it, but we are making use of technology and electronic charts and all the kinds of things that the commercial users are using.

CHAIR PERKINS: Very good. Are there any other public comments?

MR. DASLER: I just want to follow up on that. Jon Dasler. Just, I guess, to address the non-mariners that are boaters, I think it was in the HSRP meeting, maybe it was in Charleston where they talked about when the bridge opening is going to happen, there would be tweets or text messages that would go out. So imagine if rather than having these non-mariner boaters out there, rather than them getting the equipment they need, you use what they have like an iPhone or something like Waze. So instead of pothole ahead, car on the side of the road, police car ahead, it's oil tanker headed your way, tug in tow and some kind of more social outreach where a lot of people have that already. I mean having something like that might be a way to reach those people that aren't as nautical.

Maybe while I have the mic, couple of thoughts. I appreciate Dr. Callender's discussion on partnerships and costal resilience, so I mean, I guess to Rich Edwing, I noticed a lot of the tide stations now, you're seeing less and less, where they don't list NAVD 88 in the title datums on them.

I think maybe because there's been some issues and maybe that's some of the stuff we see in the Northwest, but it's really important. So, a lot of times when we're kind of validating VDatum, knowing what that is -- I know CO-OPS does GPS observations and so moving forward looking at OPUS IDB to where those observations could get put into OPUS IDB would be really helpful for the engineering and surveying community to kind of see those relationships. It's pretty critical, I think, to our operations to do that and to help VDatum and what was used. So some more transparency on that end, but I do appreciate the outreach to USGS. I think that could be a big benefit.

I know the Columbia River Pilots could really benefit from the USGS gauge at Beaver Army Terminal, getting into their Columbia River ports system, that's a key gauge for them, so that continued outreach, I think, is pretty good. I think in regard to NRTs, don't forget about partnerships. There are a lot of launches out there with survey equipment on board and surveyors with local knowledge, not only from private industry but Corps of Engineers and other things that can respond readily. That should be part of the national plan, I think it is already but I think just don't forget about that. It was good to see the update of the Gulf Coast plan moving forward. I think that should be key to costal resilience moving forward.

One thing I noted is when you look at what has happened over the last five years, which was 2,600 square nautical miles, and then seeing there's, what, 7,200 square nautical miles to go. If you do the math, it's about 13 years to cover crit areas in the Gulf, and with current funding levels, that isn't there. If you look at everything prioritized you're looking at 120 years for the 62,000-some square nautical miles so I guess my question would be is that acceptable.

So there's continued efforts to try to increase funding. At one point, a lot of that work is being done through contractors in the Gulf. At one point, contracting was up to 32,000. In FY 16, that budget went up to 27,000,000 through efforts through Congress. But I see in the FY 17 budget, it's back at 25 so we -- it seems to be continuing to push that rope and what can we do to help that because I think, just looking at the numbers on the Gulf plan that more needs to be done.

CHAIR PERKINS: Thank you, Jon. Your contributions are always appreciated and your service on the Panel previously was appreciated as well. We do have a follow-on activity for the Panel so we need to conclude the formal portion of today's meetings. So we shall officially say, as of 3:37 p.m., we are concluded for today's public meeting.

(Whereupon, the above-entitled matter went off the record at 3:37 p.m.)