U.S. DEPARTMENT OF COMMERCE

+ + + + +

NATIONAL OCEANIC AND
ATMOSPHERIC ADMINISTRATION (NOAA)

+ + + + +

HYDROGRAPHIC SERVICES REVIEW PANEL
PUBLIC MEETING

+ + + + +

WEDNESDAY
NOVEMBER 28, 2012

+ + + + +

The Panel met in Ballrooms 1 and 2 at the Astor Crowne Plaza Hotel, 739 Canal Street, New Orleans, Louisiana, at 8:30 a.m., Matt Wellslager, Chair, presiding.

PRESENT:

MATT WELLSLAGER, Chair

SCOTT PERKINS, Vice Chair
REAR ADMIRAL KEN BARBOR
LAWSON BRIGHAM, Ph.D.
JEFFREY CAROTHERS
CAPT. DEBORAH DEMPSEY
REAR ADMIRAL EVELYN FIELDS
WILLIAM HANSON

DAVID JAY, Ph.D.
GARY JEFFRESS, Ph.D.
FRANK KUDRNA, Ph.D.
CAROL LOCKHART
JOYCE MILLER
SUSAN SHINGLEDECKER

NON-VOTING MEMBERS PRESENT:
ANDY ARMSTRONG, Center for Coastal and Ocean Mapping, University of New Hampshire
JULIANA BLACKWELL, Director, National Geodetic Survey
RICHARD EDWING, Director, Center for Operational Oceanographic Products and Services
DAVID KENNEDY, Assistant Administrator, National Ocean Service
NOAA STAFF PRESENT:

REAR ADMIRAL GERD GLANG, HSRP Designated Federal Official
TIM OSBORN, Navigation Manager, Gulf of Mexico Region
MARGARET SPRING, Principal Deputy Under Secretary
CAPT. JON SWALLOW, Chief, Navigation Services Division, Office of Coast Survey
KATHY WATSON, HSRP Program Coordinator
CRAIG WOOLCOTT, NOAA/NOS/PPAD

NAVIGATION SERVICES STAKEHOLDER PANEL:

CHRIS D. BONURA, Director of Industrial Development, Port of New Orleans
CAPT. PETER W. GAUTIER, Captain of the Port, U.S. Coast Guard Sector New Orleans
KENNETH GRAHAM, NOAA/NWS Meteorologist in Charge, Weather Forecast Office, New Orleans-Baton Rouge
CAPT. DOUGLAS J. GRUBBS, Crescent River Port Pilots Association
CAPT. MICHAEL R. LORINO, JR., President, Associated Branch Pilots (Bar Pilots) for the Port of New Orleans
CAPT. DAVID B. TRENT, President, Port of Lake Charles Pilots

GEOSPATIAL & WATER LEVEL STAKEHOLDER PANEL:
HENRI BOULET, Executive Director,
LA-1 Coalition
STEPHEN V. ESTOPINAL, South Louisiana Flood
Protection Authority - East
JAMES E. MITCHELL, Ph.D., IT GIS Manager,
Louisiana Department of Transportation
and Development
CLIFFORD J. MUGNIER, Center for
GeoInformatics, Louisiana State
University
RANDY L. OSBORNE, Center for GeoInformatics,
Louisiana State University
ROBERT A. TURNER, JR., South Louisiana Flood
Protection Authority - East

ALSO PRESENT:

JON DASLER, David Evans & Associates
RALPH DIAZ, Boh Brothers Construction
SEAN DUFFY, Big River Coalition
RICHARD DURRETT, Waggoner Engineering
WIN ELLINGTON, Office of Senator Thad Cochran
CHERRIE FELDER, LMRWSAC
JOE GONZALES, Manson Construction Co.
P.J. HAHN, Plaquemines Parish

KURT JOHNSON, Louisiana Department of
Transportation and Development
JOSHUA KENT, Louisiana State University (C4G)
TARA LEVY, C&C Associates
MATT LOVE, Ocean Conservancy
JAMES MURPHY, MARAD
MIKE NITSKA, The Hydrographic Society of

America, Louisiana Chapter
GEORGE PETRAS, U.S. Coast Guard
JASON PORET, Hydroterra Technologies
NANCY RABALAIS, National Sea Grant LUMCON
CAROL SHORT, University of New Orleans
BETHANY STICH, University of New Orleans
KIRSTIN SULLIVAN, U.S. Coast Guard

SUZANNE VANCOOTEN, NOAA/NWS, Lower Mississippi
River Forecast Center

TABLE OF CONTENTS

TABLE OF CONTENTS (Con't.)

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

(8:36 a.m.)

CHAIR WELLSLAGER: Good morning. Welcome to day two. We have today some business things that need to be taken care of first and foremost. All speakers and guests, if you could please sign in, that would be greatly appreciated. The court reporter takes that information and logs it in.

There will be stakeholder breakout sessions with HSRP members on Thursday. If you look on the back table you will see one of three sheets. We have, as I said, three breakout sessions. The sessions include hydrographic surveying and charting, geospatial positioning needs, and tides and currents -- well, tides, currents, and water level needs for the Gulf of Mexico. They have a brief synopsis at the top of the page about what each of these will actually be and then below that you will see bullet points. And on these bullet points are going to be places for

you to collect some thoughts and put down talking points that you would like to address during the breakout session tomorrow. We will collect those at the end of the day and these will then be provided to the facilitators of the breakout sessions tomorrow so they can direct the course of conversations and the things that we are going to try to discuss during these breakout sessions.

The sessions will last about two hours and they were started in Alaska as a way to really drive home some of the things that we wanted to find as speaking points and points we wanted to address to NOAA Administration and they were a success, a huge success. So, we wanted to bring the same down here to New Orleans and see what the New Orleans area had to say about the navigation products provided by NOAA.

Other than that, people speaking, if you would please try to speak slowly, clearly and into the mike. Our court reporter

had a difficult time at times yesterday trying to keep track of some people as they walked around, myself included not being very good about that. But the idea is these mikes are here for a purpose and we need to use those.

Other than that -- oh. And panel speakers, if you would please before the end of the day make your PowerPoint presentations available to Kathy Watson, our coordinator, because she will take those and add them to the HSRP website as part of this meeting.

MS. WATSON: Or you can email them to me.

CHAIR WELLSLAGER: Other than that, with the breakout sessions today we will have speakers. They will each have about 20 minutes to talk and make their presentations. We would like to hold questions until after everyone has had the chance to speak and then open the discussion to the entire panel. I will do that this morning and then again this afternoon.

Admiral Glang, is there anything that you can think of that we need to address?

ADMIRAL GLANG: Good morning. Gerd Glang. I would like to welcome the stakeholders this morning for our panel, welcome back the HSRP panel members for day two of our New Orleans meeting.

Just some housekeeping items. You should have noticed by now for those folks here for the second day where the exits are. To my left there is a stairway that goes down and then to my right, there is a fire door that gets you out in the other direction. And then the bathrooms are out this way as well. And that is it for sort of the maintenance and housekeeping.

So I welcome everybody back for day two and look forward to a good discussion. Thank you.

CHAIR WELLSLAGER: Well, I think that about covers everything. Kathy, is there anything that you think that we need to

address?

MS. WATSON: No, I think you got it.

CHAIR WELLSLAGER: Okay, very good. A little bit ahead but Captain Douglas, would you like to start things today?

CAPT. GRUBBS: I'd be happy to.

CHAIR WELLSLAGER: Thank you.

CAPT. GRUBBS: All good pilots go to their ships early. And that is for a good reason. They need to make sure that the coffee is well done.

(Laughter.)

CHAIR WELLSLAGER: I forgot to put the ladder down there at the base of the thing for you. Sorry about that.

CAPT. GRUBBS: Well, I will find it. I will find it. If I want to get off this ship, I will find it.

Good morning, everybody. Welcome to New Orleans. It is really a pleasure to see you people down here. So with that, let

me just give you a quick scope of what you are seeing on your screen.

This is not a simulation. This is the cruise ship Carnival Elation that we went down the river with Monday night. And while everything looks crisp and clear on this eChart, it was rainy and foggy, typical New Orleans weather. So at times it was clear and at times it was blacked out rain, and then at other times maybe a little blacked out fog. But with the type of navigation that we have here on the river, that is normal. That is a normal day.

This is, what you are seeing here is a NOAA S57 database. So all resurveyed. This was started in 2003. It was a collaboration of the Corps of Engineers and NOAA in resurveying the Mississippi River from Baton Rouge to the sea.

And this is what we used: accuracy bank-to-bank. And this is what the pilots wanted because we were heavily involved and

inscribed in this. The bank-to-bank accuracy is about four to eight meters, which is really good. All your aids to navigation are pretty much in the place that they -- you all can hear in the back? Nobody's going to throw popcorn? Okay. I've got orders to talk into the mike. Let me do that.

All your aids to navigation are pretty much in place but pilots do this every day. If there is a light misplaced or a buoy misplaced, they know it. The difference between e-Navigation as we know it today and what will be in the future and pilots is that we can turn all this stuff off and we would still get from point A to point B. But this is the next level of help that we get.

All the targets here, if it is a red dot they are stationery. The anchored ships -- let me turn this down a little bit -- whether they are anchored ships or other vessels. You can see the anchored ships.

Most of the AIS targets -- and

these are all AIS targets. There is a lot of barge fleeting up in here that we are not picking up on this but we will pick up on the ship's radar. All your pipeline crossings, your anchorage management areas, and pretty much anything else you need to know. And it is programmed like we have our charts, our eChart on six different levels. So we have different aspects of the chart on six different levels.

For instance, if we wanted to an absolute clear chart for nighttime navigation where all the other aids to navigation wouldn't get in the way, we would just click on this and it removes everything, the docks, the aids to navigation. All you are seeing is the bank-to-bank and all the vessels in-between.

Get back to some of the attributes. If we wanted surveys, we click on Chart 5 and we have surveys. In areas where the Corps surveys every week or few days, we

will get this company Raven will go to those either the NOAA website or the Corps website. They will get either the surveys or the S57 updates, repackage it, and put it on our website and we can download it quickly. And sometimes with surveys we will get it every couple of days.

Now, navigating up and down the Mississippi River with a whole bunch of surveys and other stuff is just not a good idea because you might hide some of your vessels. So we generally do it on say Chart 3 or even Chart 1, we remove all that stuff.

Now I will give you an idea. There is 500,000 vessel movements from Baton Rouge to sea each year. And over here, for instance I will just give you an example, these are all vessels, whether they underway, or they are moored, or they are working barge fleets. If I wanted to know how many AIS vessels I have, I just click on right here. I have what 161 in my area, 161 vessels in my

area, not counting barges, not counting non-AIS participants. So that is 161.

So I know we are going to have a busy day. All the anchorages now are full. The port is doing great business right now. And so we are pretty much good to go.

There is an initiative coming out of IMO called e-Navigation. And I am just going to read you something really, really quick because it is a mouthful. It is a definition of e-Navigation ala IMO. "e-Navigation is the harmonized collection, integration, exchange, presentation and analysis of marine information onboard and ashore by electronic means to enhance berth to berth navigation and related services, for safety and security at sea and the protection of the marine environment." I'm not sure what lawyer wrote that.

(Laughter.)

CAPT. GRUBBS: It sounds great. It sounds good.

Now, we have to go back into like Tim Osborn said, the real world. And the real world is that someone has got to take whatever is being developed, sometimes in a vacuum, and apply it, hopefully, to his environment.

What we have got here with this NOAA S57 database is right now is as good as it gets. And it is really good. What we have got now with the Corps of Engineers surveys is very good. What we have got now with the Port of New Orleans surveying all the docks is very good. We just need to integrate this into our system where we would get the exact survey information for ships docking. Sometime back about four or five years ago, they had a large container ship going to Napoleon Avenue and there was a lump somewhere between the Dock Board's Authority and the Corps' Authority and it was maybe 100 feet, 150 feet or so. That is the debatable point off the dock. And this foist 446 foot container ship hit that lump in high river and didn't stick. It teetered into

the dock and you had millions of dollars later and a whole bunch of attorneys arguing over who was right and who was wrong. These are the things that we hope all the agencies will get together and work on.

In this e-Nav initiative you have got the Coast Guard, you have got the Corps of Engineers, you have got NOAA, all with proposals of what e-Navigation is going to look like. And for the most part in groups like this, they are getting that word around. You are getting a feeling for what we use here now and what e-Navigation is but we need more outreach from NOAA and the Coast Guard and the smart people who understand e-Navigation of what it is going to look like. Because now you have got -- e-Navigation will get to be a reality in 2014. So from now to 2014 all the details are being worked out in London -- not New Orleans -- in London at IMO. And as we all know, the devil is always in the details.

So when NOAA and the Coast Guard

and the Corps get together, they should come up hopefully with a program that applies to SOLAS vessels but will come into the inland waterway system over here and some part of that will be part of the inland fleet.

It is going to scare the hell out of a lot of people. I promise you that. I mean, if they have to buy new equipment, if they have to retrain people for whatever new equipment that might come out, the bottom line is going to be why do I have to pay for this? We are successful now. And I have a number of answers for that. Is that you want your people to be as good as they can be and you have to negotiate a better price with the training centers for training these people to use this equipment. It went to nighttime display.

So when we talk about e-Navigation here in New Orleans, I mean we are really proud of this, we have been practicing e-Navigation since 19 -- right after the Exxon

Valdez maybe, when they a port needs study and they said they needed a VTS system over here. Now VTS used to be a bad word. It used to be. VTS here in New Orleans since it lit up in about 2001 or so, is the darling of the waterway. The cynics, the naysayers, they have wrapped their arms around this VTS system, this Coast Guard and the Coast Guard just got a special place in their heart. For the local navigator, that is a big deal.

Whenever we have planning on traffic management plans, I mean, this is a city of festivals, a city of Mardi Gras, parades, river parades. It doesn't take much to get a parade in this area. A lot of fireworks, fireworks barges. And Captain Gautier hasn't turned white yet. But all this goes on his desk and then he sends it to his VTS desk and says develop a plan. And when they develop a plan, they develop it with the local partners. They have pilots up there 24/7. It was all part of the vision of VTS

New Orleans and it is working great.

So you develop this plan and you really don't stop traffic. You just maybe control a space. They do a really good job of this, of not saying everybody stop from Baton Rouge to sea. They said just slow down a little bit here, don't get to this point until this time, and this will work out fine. And we can shoot the fireworks and all the people can stand on the levee and have their Hurricane drinks -- and you need to stay away from all that Hurricane stuff. It's not good. It's not good for you. They have their Hurricanes and Cuba Libres or whatever they are going to drink on the levee and have a good time. After it is all over, all the big tankers are in, there is ammonia tankers, passenger ships, tows, then start meeting, like we are doing about right here. They start meeting and passing and safely doing so. This is not chaos at all. There is a rhyme and reason behind everything these ships do.

For instance that passenger ship coming down right here encounters this ship that is at anchor right here that was dragging anchor, and he could immediately measure this and realize he has got not 1500 feet of space, now he has got 680 usable feet of space between not two cushiony banks but between steel and bank. And he calls this other ship that was getting underway down here in the anchorage and tells him, look, not a good idea. We shouldn't be meeting right here. So he just holes up right there until the cruise ship gets down past all that stuff. They rush a pilot out to the ship that is dragging anchor, pick up the anchors, I believe they re-anchored or got underway, whatever they did with it.

But it kind of works that way. There is a rhyme and reason behind all of this. You know, bad things happen but in ports like New Orleans where you have these tools, this VTS, this electronic chart, this

Raven system, this depth data. You can come to some kind of a plan and minds can come together about well this will work. And it always does.

I know there have been collisions here in the past. And when you sit back and analyze the collisions, it is mostly human error. And that is one of the things that we want to deal -- we want to -- what we need from NOAA is what we have got here right now: a very accurate S57 database that can get better and better.

What we need from our AIS is what we have got. We need real-time information. You know when moving, turning, you need two seconds or maybe a little bit more than that, two second updates so that you can make timely decisions. What we need from the Coast Guard is for that VTS to work exactly as it is right now.

Well, no. We need it to get a lot better but they need a lot of money to

upgrade, like NOAA needs for its light, like the Corps needs. And so the big issue -- I'm not supposed to be speaking on money today but really we all get down to money. You know, VTS needs an upgrade. NOAA needs upgrades. Douglas is a very happy person exactly where I am at right now and I am here to help you with the upgrades, if we can but it all gets back to money.

So in this port, things are working pretty good. And we don't want e-Nav -- somebody's vision of e-Navigation in London to screw it up. But when you look and see what happened in this explosion of technology -- and I will just give you a quick -- I think my time is almost up here but I did start early. It's not even nine o'clock yet. Thank you.

In this explosion of technology, and I was in on the ground floor maybe of the development of ECDIS, not personally development but I was a partner with the Coast

Guard in developing VTS New Orleans. But in that development, ECDIS was being developed. Coast Guard R&D and the Canadians had an ECDIS test bed and I was privy to ride on a lot of Canadian lakers that had this big $90,000 monstrosity onboard. And this was the last word in navigation. This was as good as it gets. That's what they said.

Here is the problem. If people aren't trained to use it and if the menu is so busy that you could easily get confused with how do you operate that machine, and then some more people said well I can save you money. I will just take the ECDIS and hopefully you will have this accurate of a chart. Maybe you will, maybe you won't. And I will put a radar layer over that and I will put an AIS layer over that. And oh by the way, I have got a real smart guy in the back room who can develop an algorithm that will make it all line up. And then we will just put an automatic button for all the stupid people

onboard who really don't know too much about how do you line that stuff up and they just hit automatic.

And then you have a Cosco Busan where it is obvious there was something wrong with that pilot. He went to jail. The crew was the Chinese crew first time ever in San Francisco, first time on the bridge of that ship. He didn't understand that equipment at all. You didn't hear too much about the equipment but what happened was the equipment was on automatic. And the Chinese mate didn't quite understand it, so he was trying to realign so he wasn't seeing two targets, two different icons of the same target. And sometimes it would work and then it would go back into the automatic mode, sometimes it wouldn't.

So for a whole bunch of silly reasons, they decided to leave the dock and the end result was a ship hitting the San Francisco Bridge, an oil spill, millions and

millions of dollars, additional legislation, Congress telling the Coast Guard there is a real problem with the physicals. And so we have more regulations on the physicals, more regulations on training.

For the most part, pilots have been training for so many years. They have continuing education. This is kind of a natural part of our life but now you have to force feed regulations into a group of people who thought they were well-trained but really weren't. And some of the people who were well-trained would have to be additionally trained. It is all money. It all gets back down to who is paying for all of this and can you afford that.

Another ECDIS issue wasn't that long ago. A ship turned -- a pilot turned a ship off a northern European dock, headed out to sea. The pilot disembarks. The captain gave the command to the third officer. There is an ECDIS there. Steer so-and-so course.

You might have to deviate once or twice. And the third officer, if you haven't heard a grown man cry, but you probably hear this third officer cry trying to dodge some sailboats. And the ECDIS alarm, the audible alarm, they turned down. They didn't realize it. Now there was a visual alarm. There was some flashing. The ECDIS might have even been shaking up there. He went from 12 knots to zero knots with a 120-foot gash in the hull. He had to get it off of ground. And I can imagine a captain sending out those notices. That is really embarrassing and he will probably lose his job. Turn around, bring it into port, discharge it, put it in dry dock at some millions and millions of dollars in repair. And is that an ECDIS issue or is that a human error? Well it was a human error. Somebody that wasn't trained to use that ECDIS properly. These are the things that encourage e-Navigation development. As all of this -- and even your vertical information. What we

could use in New Orleans now is instead of having the internet -- on this same navigational system I have the NOAA PORTSþ. I have an app for NOAA PORTSþ. That is all internet. It is wonderful. A long time coming. The Port of New Orleans sponsored that. Great -- bridge clearances.

But what we could use would be instead of getting this via internet, maybe get this through AIS. For bridge peers and it could be maybe some virtual buoys, which is going to be very controversial by the way, virtually it is a navigation that is part of e-Nav approach versus visual. You don't take a whole culture anywhere in the world that has been operating for 100 years or so with visual aids to navigation, just take them and move them and put a bunch of dots in cyberspace and call that an aid to navigation. So it is going to be controversial. Some of that you can do but you have got to be real careful. It's not that cheap just to put a virtual

system in place. Somebody has got to be responsible for all the chart updates there.

But you might want to put a couple of virtual buoys leading up to the bridge approach because in New Orleans you are going to get caught in the fog. You are not supposed to be running through the harbor in fog but it happens all the time. You start up at Audubon Park. At Six Mile Point it is clear. By the time you get down to heading down the Greater New Orleans Bridge, it is blackout fog. It happens that quickly. So maybe a better approach toward setting your ship up for that approach to the bridge and then also having that PORTSþ information through AIS where you can get the bridge vertical clearances quickly; not having to switch back and forth between my chart and the internet.

And the internet works in New Orleans but when you get down in the lower end, sometimes internet is not that reliable.

But AIS is reliable.

We learned a lot after Hurricane Katrina. All your radios, I mean everything went dead -- cell phones. What did work was AIS, ship-to-ship. We could easily see the tugboats that were washed on the other side of the levee still had power, had its AIS and we could see where it was at. It was sitting in somebody's house but the AIS was still clicking and we had a position on it.

AIS is the common denominator between SOLAS and shallow water. The tour boat people took AIS and ran with it and they have done some wonderful things. So the key to all these PORTSþ is not one person having enough money to be able to afford something and the poor guy can't, it is this common denominator that we can all pick and choose from. It is a set of tools that is available to me as a ship pilot and that cruise ship with all the money they have got and that tour boat who is really operating on a very, very

slim margin. And AIS is one of those tools.

Now there are going to be many aspects of e-Nav that should be discussed. We don't have time to discuss it all but if anybody has got any questions after this is over with, I would be happy to answer it.

But it is a pleasure speaking to you all. Again, welcome to New Orleans. Have a good time. Pull me off to the side. And I am really happy to meet Captain Dempsey again. I guess I am showing my age. Captain Dempsey was a cadet for Kings Point when I was a pilot on a dock of lights. I don't know how long ago that was.

MEMBER DEMPSEY: Excuse me, Captain. The Maine Maritime Academy.

CAPT. GRUBBS: It may be dementia, I don't know. But we have all come a long ways and I am glad to see you here in New Orleans. Thank you very much.

CHAIR WELLSLAGER: Thank you, Captain Grubbs.

(Applause.)

CHAIR WELLSLAGER: We will address questions to the entire panel at the end of all the presentations.

Our next speaker is Captain Peter Gautier, the Captain of the Port, United States Coast Guard, Section New Orleans. He will be addressing the integration of navigation and waterways vessel traffic data: highlighting storm and flood protection concerns.

MS. WATSON: We need just a minute to log out of computers.

CHAIR WELLSLAGER: Not a problem.

CAPT. GAUTIER: Maybe I'll just take a few moments as this is queuing up. I really appreciate the invitation to come here and speak today and see a couple of old friends, some veterans from the Deepwater Horizon spill.

And it is always nice to hear a compliment from a river pilot in the morning.

So thanks, Captain Grubbs. That doesn't happen very often but in truth --

CAPT. GRUBBS: Few and far between?

CAPT. GAUTIER: -- the VTS is a collaborative effort. Captain Grubbs was a central driver in getting the VTS formalized in its current form. And it is a shared effort between the Coast Guard and we do have -- we are the only VTS in the country that actually has pilot advisors who are actually there together with the Coast Guard employees helping watch over the traffic every day. So thanks very much, Captain.

I guess in terms of the panel, you have heard about AIS and electronic navigation. You are going to hear more about the Port of New Orleans and future growth. We are going to hear about some navigation challenges from Captain Lorino and we have got weather service and others.

The way I view myself in this mix

is basically an integrator. Now we have a great woman on the city council here, Jackie Clarkson, who calls me the Czar of the Mississippi River. And I just think that is great but I think it is a complete misnomer because although the Captain of the Port does have some very awesome authorities to effect safety and security, environmental protection Mississippi River and offshore, really what we do is absolutely a collaborative effort between everyone from the river pilots, from the other federal agencies, as well as state and local agencies. So really what I view myself as is a coordinator and an integrator. And what I want to do is just use the next few minutes to illustrate how we do this, how the Coast Guard does this integration and collaboration with the greater port community when we get bad weather, which we tend to do here in southeast Louisiana. And this is timely because of the recent impact from Hurricane Isaac.

What I would like to do is as I discuss a couple of things is use some photos from the Hurricane Isaac response to illustrate these points. Can everybody hear me okay? Okay.

The importance that NOAA provides to us, the Coast Guard and I think the greater port community, starts with data. It starts with just raw data that then is segued into information which then becomes knowledge. As the Captain of the Port, my staff and I have to make a lot of key decisions in terms of preparing the port and then responding after we get a strike from bad weather. And these decisions are heavily contingent upon knowledge that we gain from the products that NOAA provides to us.

Now forgive me. I know this is a hydrographic group but there are other elements of NOAA that come together during times of and pending heavy weather. And I am going to talk a little bit about those because

the lines blur in times of emergency. And so I am going to talk a little bit about the weather products that were provided and scientific support that we also get from NOAA in terms of pollution response.

But what we have here in New Orleans is something called the Maritime Hurricane Contingency Port Plan that governs how we prepare a waterway when we know that we are going to get tropical activity headed our way. What we do here in terms of the framework is not a lot different than my counterparts, other Captains of the Port around the country do as well. We have these same sorts of port conditions, these same steps that we walk through to prepare ourselves for a hurricane but we are just a heck of a lot more challenged down here. We have got a five-port complex that is linear, unlike any other place in the country. The distance of this continuum of the port complex is longer than the distance between the drive

on I-95 between Washington, D.C. and New York City and yet this is all a single integrated port complex. And the waterway is a limited resource. You only have so much area, so much x- and y- axis available to you to navigate, to have terminals and other activities that go on that waterway.

So that is context. What we do is we start with the Weather Service and their predictions for when we are going to hit, how severely we are going to get hit, and what direction and what kind of storm surge and winds we are going to be getting and we use that to walk through different port conditions that are just outlined here on this slide.

One of the challenges we faced here on the Mississippi River is the mouth of the Mississippi River juts out into the Gulf of Mexico, probably unlike anywhere else in the country. When the port closes, it closes because you get heavy weather in the Gulf of Mexico. It is not because you are getting

heavy weather in New Orleans. And there is a time delay and that delay is shown when the Bar Pilots, Captain Rooney and his staff, stop taking ships in and out of the Mississippi River because it simply becomes unsafe and it becomes too rough to board these vessels. No one can come in or come out and essentially we shut down access to the Mississippi River. And this happens typically well in advance of when we get heavy winds and strong storm surges in these port complexes upriver.

Okay, so some things that we need to orchestrate based on these weather predictions and the storm surges that we think we are going to be getting. We move vessels and we secure vessels. We collect information. It is very important to me to know where things are before the storm and that is so that we can make decisions on what to move, if to move, how to secure in place, and then compare before and after. Do we have everything after that we had before a storm?

Now in the case of Hurricane Isaac, this storm changed trajectory, predicted trajectory, very quickly over a weekend, which gave us very little time to effect port movements in order to lower our risk within the Mississippi River. What we did do was we moved as many deep draft vessels upriver as possible away from the vulnerable areas in the lower Mississippi River that are more prone to the high winds, that have less protection from land than you can get upriver. Unfortunately because of the time crunch we were under we had 110 deep draft vessels in the lower Mississippi River at the time that Hurricane Isaac struck. It is a lot of vessels but you simply don't have enough time, given the short time frame to make decisions that you would like in order to clear as many vessels out of the Mississippi River as possible.

We do move as many upriver as possible and we do a number of things on the

Coast Guard side to prevent ships that are at terminals in safer locations from coming off those terminals and going downriver to more vulnerable anchorages. So we do these through VTS rules, through Captain of the Port orders in order to put ourselves in the best possible situation.

Now another thing that we do, which was an agreement that was made with the towing industry after Hurricane Katrina is we move all barge fleets from below mile marker 71, which is about 20 miles downriver from the City of New Orleans up above mile marker 71. During Katrina we learned the hard way that these barges are very vulnerable and with storm surge and high winds upriver, these fleets break away. They scatter about. Barges sink. They end up in the batcher, up on the levee. That is something that we don't want.

So Isaac, for the first time, the Coast Guard activated this Memorandum of

Understanding that we have with the barge fleeting industry downriver and these barges were moved upriver and you can see some pictures of that one of a line tow. I took that picture from a helicopter as I did my last storm over-flight. And that just shows you a massive amount of activity that was going on to move these barges upriver. We move about 900. The towing industry moves about 900 barges upriver for us prior to that storm. And as a result, we were in a much better position. We had many fewer barges that broke away than we saw in Katrina.

Another peculiarity that we have here is we have a lot of canals and we have a Storm Risk Reduction System at the Army Corps of Engineers and state overseen levee districts risk reduction districts have. And one thing that we learned from Katrina and Gustav is we have some risk within this outer wall, this outer levee protection system where we have canals that cut through. Those canals

also have walls and levees that protect the city from storm surges within the canals. And what you see there, as a result of this, the state asked the Coast Guard after Katrina to clear these canals of all vessel traffic prior to a storm to eliminate any kind of risk that might be present when you see surge in these canals, if we have breakaways of deep drafts, tow boats, smaller vessels, barges. There is a threat that these vessels can float up on this surge, strike a wall, collapse a wall, and then you get flooding into the city, kind of like we saw in Hurricane Katrina. A very high consequence event that the state sought to eliminate and ask the Coast Guard to do what we can to do that.

As a result, we have constructed what we call a regulated navigational area in these canals. And that red on that slide is the footprint of the regulated navigational area that I administer during storm season. So these are areas where the Coast Guard

directs the removal of vessels 24 hours in advance of certain triggers, wind triggers and predicted storm surge triggers.

We also have a provision that vessels can remain in place if they have a waiver for the Coast Guard if they can demonstrate to us that they can implement severe weather moorings, barges that can spud down. They can put extra wires on barges and so on, in order to make sure that they can handle the potential surge in winds that we get within this system.

This was the first storm where the Coast Guard has triggered this regulated navigational area to effect the removal and the moorings of vessels that are in that system. And this is a new ball game because the Army Corps has pretty much completed, they still have a few more things to do, but for all intents and purposes they have completed this risk reduction system, the 14 billion dollar project, post-Hurricane Katrina in

order to further protect the City of New Orleans and surrounding areas from storm surge during tropical weather event. And you can see the examples of those in the photos where we have the wall that is on the east side of the intercoastal waterway as it goes through the risk reduction system and we have the wall, the west closure complex on the west side, as the intercoastal waterway heads from the Algiers and Harvey Canals west towards Morgan City.

So that process went actually very, very smoothly, considering some of the angst that we had to go through in order to get us where we needed to be. But again, here is an example of where data transforms information in order to give us knowledge so we can make the appropriate decisions in order in this case to keep navigation safe but more importantly to keep the citizens of the Greater New Orleans area that are protected by this risk reduction system, safe from the

potential of strikes to the system and then flooding.

The first objective of the Coast Guard and all of us, all emergency response organizations, state, federal, and local, is safety of life. And post-storm that is search and rescue. One thing that would be very helpful to us is to increasingly get better forecasts that integrate together with the heights of levees and walls so we can better understand where we might be getting communities that are going to be deluged, communities that are going to be flooded.

One things that you heard after Hurricane Isaac is we have got flooding where we never had it before. You heard it again and again. The Braithwaite area in South Plaquemines Parish on the east side of the Mississippi River got flooded. We got flooded from Lake Pontchartrain to the west of Lake Pontchartrain when they said that we have never really seen that before. If we could

have information that helps the Coast Guard understand and other emergency management agencies, fire and police, know we need to preposition resources, small boats, so we can rescue individuals that haven't evacuated, that would be very, very helpful. Otherwise, we are kind of shooting in the dark here.

One thing that we advertise or we tell everyone before a storm hits is there is going to be a window where we can't do anything because it is just too dangerous to do that. But as soon as the storm abates enough that we can start operating again, if we can have prepositioned resources where we need to have them to rescue people, then we can be a lot better in doing what we are mandated to do. Safety of life number one.

Number two, restoring the waterway. Captain Lorino, what is the latest estimate on how much it costs to shut down the Mississippi River per day, $280 million?

CAPT. LORINO: $280 million.

CAPT. GAUTIER: About $280 million, I think LSU did a study, for every day -- for lost revenue for every day that the Mississippi River is closed. So it become paramount that we get this thing reopened and we get traffic and commerce restored as quickly as possible at an acceptable safety level. And that is the key thing that the Coast Guard and our partners, the pilots and the ports do, is making sure that we have a reasonably acceptable safety level that we can start bringing traffic in and out of the Mississippi River again.

What we did with Hurricane Isaac was implemented a plan that NOAA, the pilots, Army Corps of Engineers, and the Coast Guard talked about after about a year and a half ago after Tropical Storm Lee hit us. And that is really, the objective of this again data information knowledge is to do what they call in the urban search and rescue lingo is a hasty search. Really a quick survey of the

waterways. Centerline survey to make sure that we don't have sunken vessels, barges that are adrift, vessels that have dragged anchor that might be T-boning across the sail line portion of the river, that we don't have any debris that might be blocking a channel.

So in this case, it was an all-hands event of getting as many vessels on the water as possible and, in most cases, just using your depth sounder and your Mark One eyeballs to see what we were facing post-storm. So the Bar Pilots got their pilot vessels out and in the process of getting them downriver to restore their operations, they did surveys. The same with the Crescent Pilots. The Army Corps of Engineers -- the Army Corps boat is the third one down. The Army Corps of Engineers got their boat out and did some surveys as well.

The bottom boat is the NOAA survey vessel. Now because we have so many ports and the Mississippi River ain't the only river

around here, the NOAA vessel surveyed the channel that went into Port Fourchon, Belle Pass because Port Fourchon is the number one offshore oil and gas exploration and production support port in the country and that is very important to get up and running again. So the NOAA survey vessels were tasked with getting the surveys there and did a fantastic job for us. Port Fourchon was able to reopen very quickly so oil and gas could get their support that they needed to get up and running again.

On the Coast Guard side, we pre-staged all of our vessels upriver as much for safety as being ready to do what we need to do post-storm. They all came downriver and did a centerline survey. And we had the Coast Guard Cutter Cypress that followed in from Houston on the west side of the storm that was able to then come in and give us some indication of what we were facing at Southwest Pass and just as important is to do the post-

storm aids to navigation surveys so we could see what we needed to do to fix ATON just to make the waterway that much safer.

So in this case, it all came together and I think the capping event was we were able to fly some of the presidents and key representatives from the pilots' organizations in the Coast Guard helicopter just to get a last look to make sure that we were okay. And the river was reopened in a controlled fashion to a shallower draft vessels first in order to get commerce going within a 24-hour period. And I think the benchmark is it continued to about five days. Given that was a much worse storm and they really had a mess on their hands with missing barges and things downriver. So I think we are getting better at going through this.

Now that is a picture of the Carnival Elation. That was a Carnival cruise ship that was steaming offshore waiting to come in and she has a shallow draft and she

has probably the best navigational systems of any vessel that you will see coming into the Mississippi River. So she was the first ship in, 24-hours late coming in from her regularly scheduled arrival into New Orleans but I think that is pretty darn good in the scheme of things.

But we did have issues. We had 75 vessels that were grounded. So the NOAA data told us that we got a storm surge of ten feet within a 24-hour period in the Mississippi River and the 24 hours after the storm, the river went down six feet. So you have this situation you are up, you have high winds, you get breakaways. We had a particular issue with deep drafts that would break their stern lines that were in midstream moorings, that would swing around. And then the water would go down and these vessels that stranded themselves then became high and dry and you can see this in the photographs.

Out of those 75 we had about 40

salvage cases, vessels that actually needed to be salvaged that had a hard time getting off bottom. So that kept everybody busy for a few days.

Here is an area that I want to explore more with NOAA. I did not know about this before the storm but learned about it since, the remote sensing aerial capability that you provide. Data, information, knowledge. We have port assessment teams that go up before the storm to find out what is there and what is going to stay. We do this after the storm to see what is not there anymore, what has moved and determine is it going to be a problem.

Now this is something I got off the NOAA's website that shows photographs immediately after the storm that were taken by NOAA aircraft. And I chose this particular one because you see a couple of deep drafts at anchorage. I think that is Magnolia anchorage. And you see one of them there that

is a little bit closer to the batcher than the others. Well that vessel is this one, is one of those there that you see grounded on the stern.

If we can get NOAA to help us, if it can be done quickly enough and if it can be processed and brought to our command post quickly enough, we can get the before and after. And if we can get folks to look at these and compare them to see what vessels have moved and where and if anything is missing, that is very helpful.

And here is another example of both the ability to know where we are going to get flooding and get this aerial survey data to us in a timely manner. This is the Stolthaven Braithwaite terminal. Braithwaite got flooded. This terminal saw 12 feet of water during the height of the storm. Well those tanks should all be in nice neat rows and you notice they aren't. That is because a number of them became buoyant because they

had 12 feet of water and they only had a couple of feet of product in them and they lifted off of their pads, moved, and then they set back down as the water receded. As a result, we had a major lube oil spill. We had 80,000 gallons of octene, a water-soluble flammable chemical that was lost from one of these tanks.

And we had other issues. We had the loss of a scrubber system off of a tank and so we had some toxic gas coming out of that tank until power could be restored there. And we had two styrene tanks, 2.4 million gallons of styrene which was refrigerated liquid, a liquid that has to stay refrigerated and stabilized in order not to explode. So this became a very important thing for us to manage. And there is the photo on the left from the helicopter. We also had 150 rail cars that lifted off of their trucks and then set down alongside them. Seventy of those had hazardous materials onboard.

The ability to process this information and gain knowledge so we know where we need to focus our efforts becomes very important. From what I have seen from these products, I think we have yet better information that NOAA can help us with in order to do what we need to do.

Now this isn't navigation-related but I wanted to show this to you. This is a NOAA product. We had 400 oil and HAZMAT spills incidents after the storm. And this is typical when you get water where water isn't usually.

This is NOAA product ERMA, Emergency Management -- I think it is Emergency Management Response Application that together with our NOAA scientific support coordination staff put together. This gives us the knowledge of what we are facing and what we need to handle at any given time. And I just show you some photos from the typical sorts of oil spills that we got. A lot of

offshore oil production, exploration production areas had been impacted. We had some wells that leaked. We had tanks that were lost and that leaked. And then we just had thousands and thousands of mystery containers, some of which contained hazardous materials that had to be fully assessed. And I am very happy with our NOAA scientific support staff and how they came together with these products to help us understand what we need to face. So this is Hurricane Isaac. I had the pleasure to sit down with one of my predecessors Captain Frank Paskewich who was the Captain of the Port during Katrina and we talked about Katrina. He had the same issues. Now he had them in a much bigger scale but they were the same issues. And I would dare say that they are facing the same issues in Sector New York and Sector Long Island Sound from that storm there in a different sort of scope. But the same sort of things, same areas where NOAA helps us in a tremendous way.

And might I just conclude with saying, you know, we talk about programs and I know that you are here to examine these things, but throughout my career I have worked with many, many agencies, many federal agencies and I have to say that NOAA is tops in terms of customer service, in terms of the attitude that the individuals bring. This is NOAA Corps and civilian staff, everybody, and it is Ocean Service, it is Weather Service. It is all the different elements of NOAA, scientific support staff that I work with. They all bring this attitude of customer service and together with the Coast Guard figure out how can we solve these problems more than just about any other agency that I have worked with. I am very happy with the service that we have gotten. I would say we do need a full-time scientific support coordinator. It has been two years and I need to have somebody from scientific support. We are at risk without that individual. I know

that is in the works. So I just wanted to say that to you all and thanks very much for the opportunity to speak.

(Applause.)

CHAIR WELLSLAGER: Thank you, Captain Gautier.

MR. KENNEDY: I hope the court reporter got that last part. Did you get that all recorded? Not about the scientific support coordinator but the other.

(Laughter.)

COURT REPORTER: Yes, sir.

CHAIR WELLSLAGER: Our next speaker we had the pleasure of meeting yesterday, Chris Bonura, the Director of Industrial Development, Port of New Orleans. He is going to talk about the impacts to the Port of New Orleans from both Panama Canal expansion and industrial growth.

And might I also say thank you very much for that wonderful tour we had yesterday. I thoroughly enjoyed that and

didn't know a bus could go through a warehouse quite the way that it did.

MR. BONURA: Well, since I have been preceded and am going to be followed by some very good navigators, I just want to point out I have no navigation experience other than trying to get a bus through a warehouse. So I will try and keep my comments to what we see as the trends that are coming up that are going to affect our growth here in the Port of New Orleans and how that might, with the idea of thinking about how we can prepare NOAA products, just to start thinking about as we get bigger ships in, larger cruise ships, larger container ships, how that is going to affect safety on the waterway and what kind of continuation of the types of products that we have now that will aid the people who get these ships here safely.

I am not going to dwell on some of this because some of it is redundant from what I told you yesterday but Louisiana has ports

all over the state and a lot of them are here along the Mississippi River, five deep draft ports. And it is a very complex system. And it is probably not organized the way most ports are organized in the sense that we have the five deep draft ports here on the lower Mississippi River and four pilot associations altogether when you also include the U.S.-flagged ships coming in, in addition to the foreign-flagged ships.

So this was somewhat of a challenge with the PORTS system and the Port of New Orleans initially took the lead on it, in the sense of trying to get the funding together and to stand up and say hey, we think this is important. And if there are bills to pay, we will figure it out as we go along but we have the agreement with NOAA.

But if you were in a state port authority, you would be able to pass all those costs on to the shipping lines and we are not in that situation. We handle about one-fifth

of the vessels I would call on the Mississippi River that use the PORTS system. So it is a little bit of a unique situation. And we have come up with a solution in terms of keeping that PORTS system on stable financial footing is that the Bar Pilots are going to put this on the bill. They have been putting it on the bills for the deep draft navigation.

All the ships that come through the lower Mississippi River have to go through the Bar Pilots. Most of them. Ninety-nine percent of them. The U.S.-flagged ones don't have to. But the lion's share of the deep draft navigation that comes on the lower Mississippi River, they get a bill from Captain Lorino. So that is how we are finding this and putting it on a long-term basis. And I really have to applaud Captain Lorino, the Bar Pilots, the Crescent Pilots, the New Orleans, Baton Rouge Pilots. And also the steamship associations and all the different shipping interests for understanding the

importance of keeping this system going and doing it in a way where there is going to be a stable source of funding that will keep it going for the long-term.

All right, again, I am not going to dwell too much on this. You saw it yesterday. Break bulk cargo and containerized cargo is really our bread and butter in terms of cargo ships. And the cruise industry is a growing portion of our business. If you look at our cargo operations are about 75 percent of our revenue. Cruise is growing. It is about ten percent of our revenue. You know, the industrial properties and the other parts of our business is the remainder. So we are continuing to see some growth in those areas and we are going to keep plugging away at that.

Now on the cruise ships, what is really driving the growth is larger ships. You saw The World that was docked at the Julia Street Cruise Terminal yesterday. But really

what we see in terms of the consistency is our home-ported cruise ships. On a weekly basis this time of year, there are four cruise ships that are home-ported in New Orleans. Two of them are here year round, that is two Carnival ships, and Royal Caribbean and Norwegian are here in the winter cruise season. For obvious reasons, they don't want to be here during hurricane season if they have to be here for half the year.

But just over the last few weeks, we have seen another growth spurt in the cruise industry in the sense that the Royal Caribbean ship has been traded out for a larger ship. I'm sorry. The Royal Caribbean has the largest ship right now. It is about 1,020 feet long. The Norwegian ship is going to be traded out for a larger ship that is about 300 passengers larger. So again, we are putting more people in an area where we have some pretty difficult navigation and the pilots have to keep an eye and have the

information available to them to know what they need to do to accurately and safely get these vessels into port.

The other thing that we have seen over the years is that our cruise passenger trend is growing. You know we saw some growth prior to Hurricane Katrina. It was growing at a pretty steady pace. That 2006 that you see there, that is the year of Hurricane Katrina where it dropped off. We didn't have a full year of cruise ships. And really what we saw was in 2005 Katrina hits and it really took -- the cruise ship industry, they plan six months to a year in advance in terms of where they are going to make their port calls and doing their advanced bookings. So it really took a long time to get that business back up and running in the Port of New Orleans.

The cargo industry came back almost immediately. As soon as that river was open and the Coast Guard and the Pilots gave the cargo ships the go-ahead, they were ready

to go and we started seeing cargo moving immediately.

It is a little bit trickier when you live in a city that had been 80 percent covered with water to get people to come back in from a tourism standpoint. That has been the ongoing challenge but what we have seen is over the years a steady ramp-up and we are now exceeding our pre-Katrina levels of passenger embarkations and disembarkations. In fact by the end of this year we are expected to hit more than a million passenger embarkations and disembarkations.

Okay, obviously a very big trend that is on the horizon that I think all the ports in the Gulf Coast and on the lower Eastern Seaboard are keeping a very close eye on is the Panama Canal expansion project. And we have to make the investments that are going to be required in order to stay on top of this trend. Now there has been a lot of speculation about how Panama Canal is going to

affect the shipping industry and I think, to some extent, there has been some irrational exuberance in that case. You have to keep in mind you are making -- in our case, we are considering over a 20-, 30-year period making a half billion dollar investment in our containerized facilities. You know, you don't want to over-create capacity but by the same token you don't want to leave any chips on the table. So that is really the very tricky balancing act that I think all the ports in the Gulf Coast have to make.

You have seen some controversy over that in Gulf Port where the Port Director resigned really because people had a misconception about what was going to happen in terms of the growth there and what could really go to that port in terms of having a 36-foot channel.

We have a 45-foot channel here in New Orleans, 47 when you consider that we have some advanced dredging. And we have 45 feet

at our container terminal. So we think that that is going to take care of the additional business in the short-term. In the long-term there are some efforts underway that would deepen the river. And again, I think that is going to be something that you need to keep an eye on in terms of the products that NOAA is providing because the stakes are bigger when the ships are bigger.

Okay, just sort a rundown here of where the Gulf Ports are. Houston, obviously, is the leader in the Gulf. New Orleans, we rank number two. And we are handling about pretty close to 500,000 containers per year and our capacity is about 600,000 containers per year. But with our footprint we could go a little bit upwards of 1.5 million containers per year. And you saw some of the new gantry cranes out there. We have increased the size of our gantry cranes, the new ones. We reach out 19 across. So those are Post-Panamax gantry cranes. And again, that is an

indication that we see those ships getting wider. Again, we have to keep an eye on the products that are being provided in terms of making sure that we can safely navigate those vessels.

Okay in terms of what we see in the Panama Canal right now, the Gulf Coast accounts for about 12 percent of the Panama Canal traffic. The East Coast is 54 percent. So again, we see a very important opportunity. It is a game-changer but let's keep it all in perspective in terms of how much impact it is going to have to the Gulf Coast. When you really consider the volumes and kind of project them out, what we are talking about in terms of additional Panama Canal trade lane traffic coming through to the Gulf Coast is about an additional one and a half million containers per year spread out over several different ports. You know, our goal really is to reach a million containers per year, say over the next 15 to 20 years. You know, we

think that that is a pretty good goal to have. It is ambitious but not overly ambitious and that is where we are aiming at. Some of that growth is going to come from the Panama Canal expansion. Some of it is going to come from our other trade lanes. So if you look at our volumes over time, we have seen the container volumes growing at a pretty steady pace, about seven to ten to thirteen percent per year. The break bulk cargo that we do over the last four or five years, it has been hit by the recession, but that has been fairly steady over the last several years. And if the economy would finally get going, we would see that increase quite a bit as well. But we see the Panama Canal as a real opportunity and we are going after that trade pretty aggressively.

Now you all saw some of this up close and personal yesterday but just to give you sort of a birds-eye view of it in how it all lays out, the red area and a little bit of

the green area is where we were yesterday. And this is where we have our existing terminal with about a 600,000 container capacity per year. Now depending on how we operate, we could probably stretch that number out a little bit more. But in terms of our second phase, the green phase that you see there, that would involve strengthening some portions of the wharf and moving that little -- let me see if I can get a pointer over here -- this little green area here is the movement of our intermodal rail terminal which is located right here right now, bringing that back along the Clarence Henry Truckway. And that would make room in Phase III for this very big footprint.

Each of these two phases are about 250 million dollars a pop. So what we have been doing over time is we break out Phase II into several stages. So part of that work, one of those stages were the new cranes that you saw. It was five acres of additional

marshaling yard, which is in this area right here, this green, which has been done already and is included in that 600,000 container per year number.

Okay, so our next phase of this, as I mentioned, is the Napoleon Intermodal Terminal. And we are in the process of designing this project right now. We received $16.5 million in TIGER funds in order to complete this project. And I think this project really speaks to what we do as a port. You know, the lion's share of our cargo in New Orleans is not going to stay within the State of Louisiana. There is some very important cargo, as I mentioned yesterday, the poultry and the chemical exports that we deal with in New Orleans that are related to Louisiana economy but we really position ourselves as the port for the Mississippi Valley and we have very close connections with those inland ports. We have a very tight network of barges and rail and trucking that get the cargo to

and from those inland destinations.

And when it comes to moving containers, there is really no more efficient way to move a lot of containers in a short time than intermodal rail. We have -- our expansion footprint is actually a piece of property that we bought from the Illinois Central Railroad and it had a railroad on it already. And what you see here in this picture is operations that we have sort of inherited from the Illinois Central. We have made some repairs and we are already bringing in rail in that area. But the TIGER grant is going to allow us to make this much more efficient and will allow us to really better serve those inland customers.

Okay, I think another issue that we have to be mindful of in terms of the products that NOAA offers is the issues that we have been having lately with funding. In New Orleans in the Lower Mississippi River, in a sense, we have been blessed for so many

years, where other ports have had these issues and we haven't. However, I think the funding level for the Corps has gotten to such a level that even on the greatest waterway in the United States, the Mississippi River, we are seeing the impact. You know, 30 percent of the vessel calls in the United States are being constrained by inadequate channel dimensions. That is really staggering when you think about it.

I mentioned a little bit yesterday not just that the depth of the river but the width of the channel has been affected in recent years in pretty dramatic ways. And that is obviously something that the pilots have to contend with and that we have to keep a very close eye on.

The real big mystery of this whole thing though is that there is a dedicated source of funding for harbor maintenance but only about half of it is spent for its intended purpose. That is an issue that is

really, Sean Duffy, who I see in the audience here today, he has been fighting pretty hard on. Congressman Boustany has sponsored some legislation that would put a lockbox around that harbor maintenance trust fund. And that is something that we have been advocating pretty heavily for and keeping a close eye on.

Additionally, I mentioned that over time as we see these trends going on with the Panama Canal and the opportunities that are available. We are looking at ways we could actually increase the channel of the Mississippi River. The channel is authorized to 55 years about 40 years -- 55 feet 40 years ago but those funds were never appropriated. Congressman Richmond has sponsored the DREDGE Act and one of the things that it would do is to construct the 50-foot channel and also take some of that material and use it for coastal restoration and beneficial use.

So those are the trends that we see coming down the line and we thank you so

much for coming to New Orleans and taking a look at our port. And if there is any questions later on, I would be happy to address them.

(Applause.)

CHAIR WELLSLAGER: Thank you, Chris.

Our next speaker, Captain Michael Lorino is the President of the Associated Pilots, the Bar Pilots, and he will talk to us about the challenges for safe navigation and operations, current and future, for the Lower Mississippi River.

CAPT. LORINO: First of all, thank you, Mr. Chairman. And Admiral, it is nice to see you again. And Members of the Commission, it is a pleasure for the invite to come speak and listen to everybody.

But before I do that, I wanted to say, Captain Dempsey, it is nice to see you again. I remember a few trips we made in the Gulf Outlet on the Lykes Brothers ship. Maybe

about four or five years ago I think we did that. I don't know.

MEMBER DEMPSEY: Thank you.

CAPT. LORINO: But I've been a pilot on the river for 33 years and I have been lucky to be president for the last 13 years. So Captain and I go back a long way and I have enjoyed it. It is very nice to see you.

But before I get started, I think it is very important, you know Tim asked me to speak about a little bit about navigation but I could not come before this Commission and just talk about navigation without talking about NOAA.

As I mentioned, NOAA, for the past 13 years that I have been dealing with them, has moved weather, in my opinion on the river, into the 21st century by leaps and bounds. What happens, what is so very important as Chris said, we have five ports on the Mississippi River. If you take those five

ports and you decided to put them all into one port, you would have the largest port complex in the world. In the world. That is how much traffic and that is how many ships move in and out of this river system. So when I like to talk about it, I don't talk just about the Port of New Orleans, I talk about the river system because that is the most important thing to the state and also the economy. But what you have there which is so vital that NOAA provides to the industry is when we do have hurricanes, or we do have a collision or we do have something, an oil spill, whatever the case may be, NOAA is the first one, Tim Osborn is the first one on the phone to me. "Mike, what can we do?" Now when someone calls you and says Mike, what can we do, that is very, very important. And like I said, I would be remiss if I did not give credit where credit is due.

Let's look at hurricanes. Captain Gautier said that a few minutes ago. We had

over a hundred and some-odd ships in the river. The Southwest Pass is 125 miles below New Orleans out in the Gulf. Every single one of those ships want to wait to the very last minute to leave this port. And you have to travel ten to twelve hours to get down there. You can't do it. You cannot do it.

What did we do? As I said, Tim would call me. We talk privately. We get people on the phone from the Weather Service and I start looking at projections. During Hurricane Isaac, I called Captain Gautier I think it was on a Friday before the hurricane arrived. And I said, Pete, it looks like maybe Monday we are going to have to shut this place down. But I didn't pull that out of a hat. I pulled it out of working with Tim, working with NOAA, working with the experts on the telephone that would give us the projections of when we were going to have 18-, 20-foot seas out there aboard ships, when I had to get my people out, when I had to get my

boats out. That allowed industry, which is very important, to make plans to get those ships out a few days in advance. So I just wanted to say that and it is very, very important.

Also very important is after the storm passes. Most of the time when the storm passes and they see it is inland, the first people on the phone are the agents saying Mike, can we move our ships. Captain Gautier knows that because I bug him all the time and say Pete, we have got to get the port open, but that's all right. But once again, on the telephone with NOAA, Tim, the information is invaluable. So I just want to say on that part of it, which is great, Tim, thank you. Admiral, you have got a great team. Keep up the good work. And it is absolutely -- I know you need more funding. We will get into that in a few minutes but you deserve a lot more. That's all I am going to say on that for right now.

There is also another very important part that NOAA provides. Coal is a very big commodity that is being exported on the Mississippi River today. Now we all know commodities go up and down. It might be great today. It might be terrible tomorrow. But the bottom line is I needed information on an area off of Southwest Pass where we were looking to do some topping off. Today we load to 47 feet. They wanted to load those ships to 55 feet. So rather than Tim calling me, I actually got a chance to call him and say Tim, can you help me with this project?

Within a week, he had his team out there. They put a plan together for me and that information has already been disseminated to industry and people are looking at setting up an offshore terminal off of Southwest Pass to top off coal. So once again, Tim, thank you. NOAA, thank you.

A lot of people don't realize what goes on and how it works.

Let's talk about the PORTS system for just a minute. As Chris said, the PORTS system works very, very well. They needed money. We could not let that system disappear. As Chris said, what we did was we sat down and we said what we would do. Who uses the PORTS system: 99.6 percent of the ships coming in in the Mississippi River use the PORTS system. The other four percent is the American-flagged, which you have very ships but they still use it. But the bottom line is, we said let's let those people that are coming in here and getting the benefit of the PORTS system, pay for the PORTS system.

So we took that to the Pilot Fee Commission, along with the other pilot groups, industry. It was an unanimous, unanimous support to fund the PORTS system.

So I don't know how it is done in other places, Admiral. I don't know how it is done but that is something you might want to look at and think about.

Funding, I know NOAA does not receive enough funds. I can damn well tell you the Corps of Engineers doesn't receive enough funds because I deal with them every day and they do a great job and they do a wonderful job when they have money and they have equipment. So I am just going to go out on a limb and say I bet you NOAA doesn't get enough goddamn money either. So anything I can do, Admiral or this Commission that you need from the Bar Pilots, and I am going to go out on a limb and say Louisiana River Pilot Association, that you need from us to support any effort that you have, we will do that. You just pick up the phone and call me and we will get it done. That is how important this project is to us.

When Tim asked me to speak, he wanted me to talk about navigation. Well I am going to touch on a little bit about navigation and show you a few slides that are very important. And I am going to leave NOAA

now and I am going to go to the Corps of Engineers.

As I said, the Corps of Engineers does a great job. They need money. They need equipment. And I know Bill Hanson is here and he will fuss at me sometime when I say there is not enough equipment but we will get into that at another time.

But anyway, the bottom line is the Mississippi River system is not like Portland, not like Columbia River. The Mississippi River system is its own unique system. Just last year, the Captain and I were talking about the highest river since 1937. This was last year at this time. Today I am standing up here and I am getting phone calls about no cargo coming down the Mississippi River because it is so low. That is the diversity that you have on this river system.

On top of that, we know every year we are going to have shoaling on the Mississippi River maybe once, maybe twice,

maybe three times. We don't know how bad. But we do know one thing: the Corps is underfunded. So what does that mean? That means that something has to give. We either are going to get money or we are going to lose draft. And unfortunately for the last couple of years, it has been the latter. We have been losing draft because everything is tight and I understand that but I still disagree with it.

So what happens when we lose draft? Everybody in this room probably says the first thing you look at is you can't take as much cargo out. It is not as deep. Well that is absolutely correct. No doubt about it, that is a key factor. But Chris must have been sitting at a few of my meetings, too many meetings that him and I have been together where he even started talking about width. Man, I tell you, if somebody from the Port of New Orleans can start talking about width, I am getting the message across.

So I am going to touch on a little bit about that. Or do you want to come give it, Chris? I'll let you come give this. I can take a break for a little while. I love it! I love it!

I am going to go into Southwest Pass for you. This is the lower end of Southwest Pass. Where you see the 750, that is our maximum width that we have in Southwest Pass, 750 feet by 45 feet in depth. Also, Chris picked this up very well also. The Corps, because the river shoals up so much and so fast, it is not like other ports as I said a few minutes ago, that the Corps, instead of dredging to 45 feet, they will dredge to 51 feet so that they get a little extra time to get equipment and dredges when the channel starts to shoal up.

So basically the channel is 750 feet by 45, 650 on the lower end and on the entrance, 600 feet. So I use those just to show some ships passing and just kind of show

you a little bit different here.

Okay in that 650-foot part of the channel that I showed you a few minutes ago, if everything goes great, and remember, as I said, we are a busy port. Last year we did 10,700 ships. This year we projected to do 10,812 ships if things go the way they are. So you have ships running in and out of here 24 hours a day, 365 days. They can't wait for one-way traffic. They can't wait for this. They can't wait for that. So if we go to that 650-foot channel and everything is great, we have 300 feet in-between to pass.

Now when you talk about a ship that may be 900 or 1,000-foot long, 180-foot wide, 300 feet in-between is not that big -- not that far. Think about it. So that is a beautiful day.

But what happens when you are in that 750-foot part of the channel that I showed you and that is reduced because of shoaling because we don't have those funds,

and not only the draft, the depth, but also the width, what happens when we lose that width? We go from that 300 feet down to 195 feet on those same two ships. That is a gigantic reduction, 600 down to 500. Now you have 100 feet in-between those vessels. That is nothing at all. You can look almost 100 feet in this room. And how you have these two ships passing when, as long as everything goes good, everything is fine.

There is a couple of things, and Captain Dempsey knows what I am getting ready to say, there is a few other things in here that play a very important factor that you don't see. Crew boats, fishing boats, tow boats, they get involved and get in your way. So that cuts that part of it down. What happens when it goes down to 400? Now you have no safe passing distance. These ships are right next to each other. We make it. We get by but it is not your ideal situation and it should not happen to any port in the United

States because there is money being collected to maintain each port to its full project dimensions but it is not being used properly.

Lets draw in a little wind. The Captain knows what I'm talking about wind. Her place was very, very windy where she worked, one of the toughest spots in the world. Put a little wind in there. Now, 50 feet. That's not very good.

Captain you don't need to look at these. I'm sorry. You could have went to the restroom. I forgot to mention that a few minutes ago.

Ten degrees of leeway in a 400 channel, now you do what they call in Houston the little chicken maneuver, head at each other and pull off. All of those things work because pilots are trained to do it. But that is not the way it should be done. There is a reason why the channel was not designed for 750 feet and 45 feet: safety. But for some reason, our government is getting away from

that.

I talked about Southwest Pass a minute ago. This is a very -- and I have had this happen a few times to me in my career. Sometimes things don't go right on a ship. The engine goes out, the steering goes out, somebody goes aground ahead of you, you name it, it can happen. Well now you have to stop this large ship. Somebody asked me -- Captain don't take this personal -- somebody from the Coast Guard asked me many years ago, Mike, how come you didn't just put the brakes on?

(Laughter.)

CAPT. LORINO: Well last time I was on a ship, I haven't seen a damn brake pedal one time. I don't know if you have, Captain Dempsey. But the bottom line is, you can't do that.

In Southwest Pass, it is going to take four miles to stop that ship, unless I want to run it aground. Four miles. It is a long way, ladies and gentlemen. There is a

picture of it right there. That is a lot.

Now, as I said, you can run it aground and stop it. What happens when we run it aground? What happens when we block that channel? The entire heartland of the United States is shut down. The entire heartland. There is no other way to get cargo into the heartland by ships, other than what you see right there. That is why it is so imperative that the Corps gets their money and has the equipment to do their job. And it bewilders me why we can't do that.

But anyway, as I mentioned, the Mississippi River, in my opinion, is the busiest and the greatest water way in the world. I think Captain Gautier will attest to this. He has been around the country. He has been in many ports. But when he came to New Orleans, his eyes really opened. We do things just a little bit different here, Pete. But the bottom line is we have a wonderful relationship with the Coast Guard. We have a

great system. We have a great system with industry here. Industry works with the pilots. The pilots work with the industry. You have the Corps of Engineers and now you have NOAA, another important factor of this equation. And as I said a few minutes ago, Admiral I know there is a lot of people in NOAA that are in your branch that you handle. I deal with Tim a lot, personally. He does a great job and all of your people do a great job. So I just want to say thank you for the invite. Thank you for doing a great job. And it has been my pleasure.

(Applause.)

CHAIR WELLSLAGER: Thank you, Captain.

Kenneth Graham is our next speaker. He is from the NOAA National Weather Service, Meteorologist in Charge, Weather Forecast Office in the New Orleans/Baton Rouge area. He will talk about hurricane response efforts, culmination of NOAA data products for

accurate modeling and prediction methods.

Ken?

MR. GRAHAM: Perfect! Thank you, Mr. Chairman and thank you for the invitation. And Tim, thank you for getting me over here and being able to talk to you today.

You know, I wrestled with what to say today so much because I mean I could have given a talk on what Suzanne Van Cooten does at the Lower Mississippi River Forecast Center because they are the ones that actually do the forecasts on the Mississippi River. High flow, low flow, whatever it is, they are the ones that are coming up with those values. So we could have given some sort of talk like that. I could have given a science talk and talked about storm surge and came up here and gave all sorts of information about hurricanes and so forth but the running theme, I completely changed it because the running theme here is about impact. And it is something our office in Slidell is really

trying to concentrate on. And you heard it from the speakers. I mean I wrote down some notes here about the need for impact services, decision support. It is about -- the Captain, you were saying you need more information about the communities to preposition information. So it is not so much about hey Captain, you are going to get ten-foot of storm surge, good luck to you. No, it is about here is the impact related to that. So I took that down.

We also saw on the last slide the 15-knot wind. You know a 15-knot wind affecting ships on the Mississippi River. And I am telling you we have a lot of that information and there is so much more that we can share.

So we are doing a lot at our office to shift the paradigm. Our office in Slidell with the Weather Service is a part of a NOAA initiative called Weather-Ready Nation. So what is that? Well I mean you got the

terms but here is the real gist of it. We are trying to change the paradigm of how we do business at our office.

For a lot of years -- we have been here a while. We opened our doors in 1870 in the Custom House next door. So if you haven't seen the Custom House right here on Canal Street, that was our first office. I am trying to go through the historical records to figure out where but knowing a meteorologist, they were probably on the roof looking at the weather. So I figure they were on some of the highest floors of the Custom House.

So we started in 1870. Back then it was basically I am going to look at the clouds. We will have humid conditions tomorrow, breezy, maybe a temperature forecast. And it is interesting we have done that for many years. And in the Weather Service even in the last few decades, I have been doing this for about 20 years in the Weather Service approximately, and it has

always been a situation where tomorrow it will be 75 degrees, you have got a chance of rain. I will hit "enter" and my job is done. Does that make sense? I mean, it has been like that for a long time. And the reality is now there is so much more to it. So in trying to change this paradigm, that type of mentality is over.

And I want to give you this example. My whole talk here is just throwing out different ideas to try to get input from the committee and throw out some challenges because I think that is what we are about here today is giving you some things to think about, giving us some ideas of where we are going to go forward. The way we used to do business there is a chance for rain this afternoon. Now, if you are from here, the chance for rain means a whole lot of different things, depending on where you are. So now we are working to say well the chance of rain is between 3:00 and 7:00 along I-12 between

Slidell and Baton Rouge. Why is that different? Well it is a major impact difference because that 3:00 to 7:00 is now your rush hour. And we could work with the State Police to say you need to preposition your assets, different personnel, you need to talk about overtime hours and that sort of thing to make sure to get ready for all the wrecks. Does that make sense? It is a subtle shift but there is a huge paradigm shift between what we were doing before and what we are doing now and where we are going in the future. And we are working very hard on those subtleties to be able to give that type of information out. And that is real and they do appreciate that.

We are actually trying to create an impact catalog, trying to document these impacts and try to write those down so we have that as we are looking at the science and understanding those impacts. I think that is going to be very important to document those

subtleties. You know from the oil spill, there was a big difference between seas of one-foot versus two-feet. Now traditionally, not a whole lot of difference, right? One-foot, two-foot, the casual boater or anything like that we didn't think about that too much. But that made a big difference, depending on what you were doing in the response. It made a big difference whether you all could get a certain type of boat out or visibility of two miles that we wouldn't think of too much of a big deal on possibly an interstate but that meant certain aircraft couldn't fly. So we are really trying to get into those impacts and understand them so we can work with the communities and understand those trigger points to be able to do more with that. It is really critical.

With our pilot project at our office, we are doing other things. We are getting out of the office. I mean if you go back the last hundred years, you pretty much

sat in front of either a system, whether it was a teletype and now of course computers and you put out your product, again, you pressed enter and went on. That is no longer valid. That is only part of the process. The other part is getting out there embedding with those that you are serving. Being with the Coast Guard, doing the briefings, getting out there, being with you, deploying. In Hurricane Isaac, we actually had seven people deployed out of the office with the decision-makers. It is unprecedented for one office to be able to try that and it works. It really works.

We have even taken -- and Tim knows all about this. He has been at a couple of our events and support events. We actually took an old FEMA trailer and built a weather command center. So we actually take it very serious about getting out there. And we have supported DoD at Navy Week and we are going to be right next to the City of New Orleans and DHS to be able to support during Super Bowl.

So we are going to be right there embedded with the decision-makers once again because it is not only about that squall line or that tropical system or the potential flooding. It is also the unknown, a terrorist attack or some unknown that could occur during that event where guess what, weather is still everything. So where is the bad stuff going to go? Where is the plume and we are going to be working very closely during the Super Bowl to be able to do this.

We are communicating differently than we have before. We conducted briefings. We have heard several references to those briefings. Those aren't by accident. We really try to coordinate those. We really try to get the federal state, and local officials the information that they need. And we listen. We listen to the input and we change the briefings based upon that. And every user is completely different because it is about the navigation. That is your information.

Somebody else is using the information to make evacuation, somebody else looking at lifesaving information, property and also commerce. So we try to get that out there. Those PowerPoints are available to all those that we serve. They put them in the EOCs. We get that out there. It is absolutely, completely critical.

We are also working on some other things. You know, the realization, and I always get a little criticism for this because back in the late '90s I talked about how everything should be geared towards the internet and I got a lot of pushback. And there was one person who even said you need to slow down on this because it is just a fad. It is interesting to look back at the '90s.

So now what are we talking about? We are talking -- I make fun of -- I'm not sure we are going to have websites in five or ten years. And now I am getting kind of made fun of for that. It is these apps. It is

this magic cloud that I don't fully understand other than what is up in the sky that I studied in school. It is information that is on the go.

So we are trying to recognize that you all aren't always sitting behind a computer looking at this information. You are mobile. You are on a barge. You are on a ship. You are responding on the beach. The oil spill taught us that people needed information walking down cleaning up oil on the beaches. They need this information, especially heat. That was one of the biggest -- one of the factors for safety during the oil spill response when somebody comes down from Canada and experiences our humidity as they are working on the beach and they are keeling over. That happened. It was a big safety issue for us. So we have developed a portable website that people are now using, our emergency managers and others are using on their cell phones. It is huge. The feedback

we are getting, and Tim I don't know if you are getting any other feedback, but the feedback we are getting is extremely positive. Because they don't have a PC with them, they need it where they are doing the job. So we are working on that and so far it has been successful.

And I mentioned yesterday a little bit the mile marker forecast on the Mississippi River, we have that data in the database. So we are working hard to be able to get that out there. We had that all contained in the office. How do we get it to you? And the first presentation with the navigation, we should have a forecast. Put your mouse right over any parameter in there and a little forecast pops up. These are the type of things that we need to be working together on. That's why I bring so many challenges here because we still have a lot of work to do. And then your forecast pops up.

And fog. I mentioned yesterday we

don't have sensors. And I'm not sure we can afford sensors every single mile or half mile but that ship captain or that barge or whoever it may be can sure tweet us what they see. We can take that information in real-time and turn that into real data that we put up. So that to me is exciting on where we are going. So I could ramble on forever about that stuff.

Pre-storm training. This year before hurricane season, we hit so hard the fact that you might not get a lot of notice on a hurricane. We even gave examples like Camille where there wasn't a lot of notice. We gave a lot of examples of previous large storms where you may not get a lot of notice on these hurricanes and these big impacts.

We also hit very hard in the preseason about large storms, slow storms producing so much storm surge. And little did we know that it came true for us and also came true for the Northeast. Very similar situation -- Hurricane Isaac and Sandy. And

David you were very close working with the Sandy issues. We still have a lot of work to do. The physical science, in my opinion, is getting pretty good. The forecast was pretty good for Isaac. The storm surge forecast was, you know we called for 12-foot. We heard what we got, we got 12-foot. We forecast five to eight in Lake Pontchartrain. We got 8.2 at Mandeville, which was hard for people to believe because that was forecasting a record, basically. And the comment came back so often was how could this be? It is just a category one. Or how could this be, it is just a tropical storm? We have some big challenges. The physical science seems to be, we are on the right track. There is always room for improvement. We can do more things.

You know I wrote down here one of the things, I mean the models can always get better as we get more data. The bathymetry in Lake Pontchartrain, we love to get things like that updated where we can get that into the

models. So the physical science can always get better.

I wanted to bring up this challenge. We have a pretty big social science challenge that we are tackling head-on here. The locals know how many times did I go on the Weather Channel and almost begging people to ignore the category. Ignore the category, right? Because this is a big storm. It is a slow storm. It is going to be a big storm surge. And this is the type of information we have to tackle.

We need help from groups like this to be able to tackle these challenges and the education and the interpretation of these impacts is these small changes. This is tough science to be able to communicate. Very small changes in the meteorology have exponential impact on the ground. A bigger storm or storm surge. Slow it down. More storm surge. Left and right takes you in or out of the storm surge area. Very small, subtle changes. We

are talking five or ten miles, a ten-mile change.

We have gone back with several different scientists and looked back at Hurricane remember Gustav, right, 2008. About a 30-mile difference in Hurricane Gustav. And I think, Captain you and I might have even talked about this. Only about 30-miles difference. If you went east about 30 miles, it could have devastated the City of New Orleans once again.

So subtle differences are something that it is very tough to be able to communicate that. So that is something that we have to look at, be able to teach people because every storm is different. So we are working on that. We are working to further have storm surge warnings. We are working as an agency to be able to do that. We are working to be able to try to get people away from comparing previous storms to current storms in the Saffir-Simpson scale which we

use for wind.

We have another challenge social science-wise that I definitely wanted to bring up with this group. I always use my neighbor who is Brent from Chalmette. I always want to use him because he texted me right in the heat of the battle. I could be briefing anywhere from the Governor to higher ups and Brent will be texting for information. And it was interesting to watch Brent during Hurricane Isaac. And I bring this up because with the world the way it is with technology, there is so much information that we have. I have never seen a storm where national news was breaking into programming because the latest ETA model or what model, any model, European model came out. Okay, the new model came out and takes the storm a different place and they were breaking into national programming with that. So it is fascinating to watch how things have changed with the latest couple storms. And you can't ignore these things.

You have to tackle these head-on.

So Brent from Chalmette would call me and say I see your forecast but the latest European model takes it to Florida. Think about that for a second. So now Brent from Chalmette has to take official information, model information from what he sees on television and how other people interpret where the storm is going to go. That is a lot of data to absorb, right? That is a big challenge. I think it is a big challenge that we have in working with the community to be able to decipher this stuff. So I always use Brent as an example.

Inundation graphics, we have got lots of work to do on inundation graphics. People really want to know how much water they are going to have at their house. They are going to want to know how much water is going to be close to them, how much is going to affect them.

We are doing something different.

I mentioned it yesterday. I want to mention it again. It is how we get information. If you look at the younger generation for those that weren't here yesterday, I talked about the latest hire we had at the office. She was very shocked that we still use email. That is my generation's snail mail. Wow. So that is a huge challenge. Because guess what? Those that we serve now and in the future, that is how they will receive information. It is not going to be the traditional ways of getting information.

My wife's younger sister is 22-years-old. She doesn't watch television. She gets her programming on the computer when she needs it. That is a different ballgame for us. So we have to look at that. So we are traditionally for about six decades, we have brought ham radio operators into our office. It has been effective. We are going to do something effort. We have talked to UNO. We are going to work with Mississippi State and

others to bring students in to help us tweet and Facebook.

(Laughter.)

CAPT. LORINO: It's true. Think about that paradigm shift. Again, back to the Weather-Ready Nation and what our office is trying to do. The goal is shifting our business paradigm from that phenomenon to that actual impact. And if that is how people get information, you might as well get the people that are of the right age to be able to share that because they really know how to tweet and re-tweet. For a year I thought tweet was part of a bird noise so it has taken me some time to gear up to that.

There is other projects we are working on and it is exciting. Definitely catch Suzanne working on the big challenge that we have of it is not just a storm surge, look at the challenges we have here with our rivers. We have Lake Pontchartrain that you shove water into the lake and you keep

southeast winds, you pile that water up higher and higher and higher in the west end of the lake and it spreads out everywhere it wants to go. Think about this. And then the winds go away, change direction. All that water sloshes back to the east end towards the Rigolets, gets caught up, piled. There is people around Lake Pontchartrain that don't even see their storm surge for days after landfall.

That is some of the challenges. We have heard how unique our river system is. It is a very unique place where we don't see that storm surge until days afterwards and that is very challenging.

How about this one? Storm surge up the Mississippi River. We have storm surge go up the river to about Red River Landing past Baton Rouge, we saw levels rise. Think about that for a second. Okay? That is an amazing thing. There were people along the river that I know I have talked to several

other people that actually could watch the water come up. And think about that all the way to Red River Landing is actually staggering. So I wanted to bring up some of these issues. I think there is a lot. And again, I could go on but for time's sake I didn't want to. So I thought that was an appropriate talk to bring some of the challenges up to the Committee and see if we can get some conversation going, whether it is here or later on today and to help us with some of these challenges. But I can't say enough that how close we work together out here through the briefings. We have enough -- we don't have to have a lot of exercises and drills because we have enough of the real thing that it happens all the time. There is always a spill and we get calls from the Coast Guard. Tim coordinates this. I can't say enough about Tim's role down here is absolutely incredible. There is all these people. Tim is everywhere. You really are

and you coordinate these things. So major hats off and kudos to Tim. But we get calls all the time about an oil spill. All we need is a -- think about how products and services have changed. We are doing more and more of this. If there is an oil spill or a barge incident, all we need is a latitude/longitude and we produce a spot forecast for that location. So we are doing that more and more. And that is what we are all about as a 24/7 we have got somebody right there ready to issue that forecast.

So thank you for the time. I look forward to the dialogue and again, I appreciate the invitation.

(Applause.)

CHAIR WELLSLAGER: Thank you. And to close with our morning session, we have Captain David Trent, the President of the Port of Lake Charles Pilots and he will be addressing the coastal observation systems: water levels and PORTS information.

CAPT. TRENT: All right. First off, I would like to say thank you very much and thank you to Tim for inviting me over to address this panel.

After hearing everybody speak here, I realize that I thought Captain Lorino was spot on. What has happened and what has transpired over the last ten or 12 years that I have been in Lake Charles with our interactions with NOAA and our relationships and how we have both grown has led to such success stories in so many phases, the PORTS system, hurricane response, interactions with our National Weather Service office, it just goes on and on. Tim is always he is everywhere. I don't know how many times I have been out on the river at 2:00 in the morning and I get an email on my phone. I'm like does this guy sleep? He's everywhere. We joke about it. He is like the Energizer bunny or something.

But in all honesty, it is that

kind of energy and dynamic in the proactive approach that he has taken for our area is from a federal agency, it is hard to believe. It is almost, you know, think about that, proactive federal agency. It doesn't usually go together. And it does, so much to the effect that I have people come over from Texas and actually directly ask me and say what do you guys have going with NOAA? You know? And I didn't even know what they were talking about. We just can't believe that out of Hurricane Rita and Hurricane Ike, you guys are back up and running at record speed. You know, moving stuff right away. What is your secret? You know, they were almost implying I spent a lot of time taking Tim out to lunch or something. And I said it is just communications. You know?

I was at a meeting a while back with the Coast Guard and I thought that Captain of the Port put it best. You don't respond to an incident by introducing

yourself. That has got to have been done a long time ago and it is that open line of communications that allows things to work, is readily in having the local knowledge of your area and not looking through the Rolodex trying to find somebody at NOAA to get your channel surveyed when he is already emailing, going the stuff is on the way. And it will be there and we will get this cleared out as quick as we can.

We moved ships after Rita which was the second storm a month after Katrina. Talk about a state being strapped, we moved an LNG ship six days after the landfall with four aids to navigation, a Raven laptop with NOAA charts on it and it was amazing. We didn't have aids to navigation.

So anyway, hats off on that. And I just wanted -- I think everybody needs to understand what a great tool it is all the different information you guys offer, not just the PORTS system which I have been asked to

speak about. I think it is all in this age far more important than most people ever gave it credit for.

But on that note, I will go on to the PORTS system, which I -- it's funny. Captain Grubbs was up here talking about AIS interface now because we might lose the internet. And it is a very valid point and I think it is really neat that it has progressed to that.

I was involved with the very first port that PORTS was installed in back in 1991. I was home ported in Tampa. And that was accessed by the phone and some of the vessels we didn't even have a cell phone working at the time so we would call our dispatch. They would call this little computer-generated voice number and have to sit through every station in Tampa Bay, first the tides, then the currents, then the winds, to get hopefully that one little spot of information that you wanted but we thought it was amazing. We

couldn't believe it.

Tampa, I don't know if any of you are familiar, it has got some strict current regulations -- recommendations on certain channel passages and to be able to really get real-time data, we have never had that before as a mariner. And we ran with it. And now we are talking about AIS uploads or Raven laptop interface. I have it on my phone. When I came to Lake Charles as a pilot, I came from that environment to apprenticing on that river saying well where do we get our tide information from. And you call our dispatch office. They would call down to the port and track down a guard. Port police would drive down to the dock. And somebody, hopefully with the right tape measure, would nail the board to a piling and hopefully his flashlight worked good and he would give you a tide reading. That was one spot in the port and that is what we had.

That wasn't that long ago. Okay?

I mean, we got PORTS system in Lake Charles in 2009. And we are the 11th largest port in the nation. We have big tonnage ships. It always has been. We are a small, manmade channel through a waterway. I'm not saying anything because we definitely handled traffic differently. We don't have the numbers but we have the tonnage but our channel is 400-foot, if we are not chronically underfunded on our dredging, as we always are. This year, I am down to 300-foot. We move 1100-foot ships in here, beams of 170 feet. Our standard fare, our daily fare is 900-foot vessels, 150, 160, 165-foot beams. Obviously, we are one way with these ships when they are loaded under these constraints.

The under keel clearance is -- the first question out of every captain's mouth that comes to our port is pilot, pilot how do you ascertain this. We have the same kind of fluff soft bottom. You can get hard soundings. You can only know water levels and

past practices. To say that the PORTS system is not important for us would be a great misnomer because we are so skinny on our under keel clearance. We operate under tide windows, boarding windows we call them. And the PORTS system has allowed us to expand those boarding windows.

When we got to a point not too long ago where the Port of Lake Charles says well we can't keep paying for the maintenance. They approached us. They approached Captain Lorino. We went to the Fee Commission and the users. We need maintenance funding. You guys are the ones that are benefitting from this. They said well what do you mean? Show us. Maybe unlike over here, sometimes we can't get into the same room over in Lake Charles. Some of my customers. But I said well, this is what will happen. We will go back to the old ways where we are going to have to err on the side of caution and we won't have any data to back it up. We get a cold front. I start you

in now. Prior to 2009, you got started in 12 hours after that. You know? Did the delays mean anything to you? And they got the checkbook out. Never looked back. That was the end of it. Boom!

So we funded over the whole state. We are proud of that, proud of the expansions and the mechanisms we put in place to keep it funded.

And the whole dynamic range of where this information has become available and the interface with the laptops and AIS is amazing. It really is. And it is a game-changer for us over there. We really need that information and we are hamstrung if we don't get it. It also, of course, those conditions in the fog under -- in extremis. Anytime you are in extremis, any other additional information is always a bonus. It is tantamount to making the most of what you are dealing with. And given the budget restraints we have with dredging, as I said

before, is very important. We can't get -- we are lucky to get half of our drudging funding. I won't go into dredging again because by the time Captain Lorino and I get through with you, you guys will be the deer in the headlight look. You say that is all I need to know about dredging. It is very important. The work in the evolution in the PORTS system, the evolution in the storm response, as Tim and I were talking last night, every storm -- you can't drill for a storm like you can learn from it. And every storm gets better, both on NOAA's side and on all the other users.

You should listen to our conference calls prior to landfall of these storms. It is amazing the information that gets rolled around and the preparation on all parties that is in place. And that is the kind of growth that has been around since I have known Tim. And I think that it is very important, I hope that nothing ever comes to light that he is going to change that

environment. I hope the funding stays in place. It runs an interesting train of thought when you think that we are using one government agency's growth to help answer for the shortfall of another government agency in our decline in dredging.

So one is answering the other a little bit. Hopefully we get them both operating a little bit more on the same speed. But that has really been my experience. I hope it always stays that way and I think you all have run a good program.

Thank you.

(Applause.)

CHAIR WELLSLAGER: Well thank you very much. Very interesting presentations.

I have had the pleasure of being at other ports and I can say one thing that I have learned from speaking and hearing you all speak, things get done. You don't wait for something to happen. You take it upon yourself to move things and react and get

things fixed. And hopefully with what we are hearing here, we can take what we have been able to learn and make some good recommendations to keep things going in the right direction. You have nerves of steel, being able to work in narrowing channels with ships that size. Pucker factor is huge. I am just like oh, my god, I can't imagine something like that, having worked in smaller ships. Something the size that you have got is a daunting task, to say the very least.

But I would like to take this chance to open up to the HSRP panel, any thoughts or questions they might have to any of the panel members. Mr. Kennedy, Dave, did you have?

MR. KENNEDY: One thing. There seems to be a consistent theme throughout all of these presentations that has to do with everything from -- that has to do with the resources, to have what they need here to do the job the way they want it. Admirable that

they are adept in getting the job done regardless. But there is a tremendous amount of consistency in what has been done, the players, at least the federal players that are at the table and the job they are doing and the fact that I think in all federal cases, Coast Guard included, the resources aren't there. And so I am just struck by the number of quotes that kind of I pulled out from all of this that could be used to try and work with -- and there were offers here of what can we do to send the word. I think there is plenty you can do if you haven't done it. And so I think we ought to try and capture some of the incredible discussion today, the identification of the problems, what some of the feds are doing, and use it in some sort of an approach to talk to Congress. Certainly you have some powerful influential folks right here in the region. I don't know how much discussion. I would be curious to just hear from some of you what kind of discussions you

have had with the likes of Landrieu or Cochran or whoever about these issues and their sympathy and understanding and interest. But as I said in my speech yesterday, we are trying to get to the Hill to highlight some of these issues. I certainly want to take some of what I have heard with me when I talk to the Hill. But as we always say, we can talk to the Hill, they don't pay attention like they would pay attention to almost everybody on this panel.

So the whole theme of what can we do to take the issues that you guys have and some of the praise for the feds that are underfunded and use that to all of our benefit.

CHAIR WELLSLAGER: Thank you. Margaret?

MS. SPRING: I agree. I was pulling up some very interesting and nice quotes and pithy one-liners which we feds don't do as well as maybe you all do. So

thank you for that. And I second what Kevin worked on the Hill. I know that views from the field are quite welcome. And I have taken the point that it is probably worth the feds working together and talking to Congress to explain how we work together so there is no confusion.

One thing that I did want to just throw out there is that eNavigation and integration of the informational infrastructure which is our sort of wonky word for what you are talking about which is getting everything together in one place, there is an eNav initiative through the CMTS where Coast Guard and NOAA are working together on pilots. We have done some pilots. I think any one of the things I would want to bring back from this meeting is getting that moving and maybe some more pilots going. I know that we are funding restricted but stories like bringing some of what we do into a very cogent and easy to understand benefit

is what these kinds of pilots do for us, for us as a group. And data are hard to explain but uses are easier. So I think that is something I am going to bring back from this.

CHAIR WELLSLAGER: Thank you. Frank?

MEMBER KUDRNA: This is for Captain Gautier. I served on a congressionally-mandated independent peer review group for the flood protection system here in New Orleans. And when our group came down, I remember seeing a barge sitting on top of a couple houses. And I know it was debated at the time whether the barge breached the levee or there was a breach in the barge -- the barge moved through the levee.

At the end of our work we expressed concern to the Corps that breakaway vessels and barges could severely damage the system and they said they were going to work that out with the Coast Guard. And what you described to us as the movement of barges out

of the system and tying and anchoring vessels more adequately is the response. And we had discussed either such an option or the option of some more physical protection that would better armor the earthen levees in such a way that a breach wouldn't take place.

After one event that you at least have a data point, do you think your system is going to do the trick or do you think there is a need for more armoring in the future?

CAPT. GAUTIER: Well that is a great question, sir. We also have Bob Turner from the Levee District East here, who has a big stake in this discussion as well.

The system that we have now is contingent upon perfection, I would say. We have to be right. There is really no margin for error. And for the Coast Guard, that puts a lot of risk on our shoulders. There hasn't been any armoring or any redesign or any beefing up of the walls, since the original design or construction that I am aware of. I

have been here a year and a half, which really leads to us having to evacuate the canals in time, based on the best information that we have, hoping for no lock failures, trusting and helping to coordinate that all westbound traffic on the Intracoastal Waterway will clear through the gates and out through into the river before the storm is upon us, and that the waivers that we have in place will be properly executed, if we reach those levels where we get the water at sufficient height and we get the possibility for a breakaway.

So I mean certainly, and I think Bob might agree with me, I think there is room for increasing the robustness of the system to be able to withstand some strikes. And the latest conversations have been what happens if it is not something that is in the water that the Coast Guard has jurisdiction over. What happens if it is a large object, a yacht on land, that then floats up on the storm surge and then has the potential for striking the

wall? The Coast Guard doesn't have jurisdiction over that. So I think there is certainly room for those discussions and improvement, of course, resources being the critical issue in this case.

CHAIR WELLSLAGER: Bill?

MEMBER HANSON: Yes, if I can maybe try to what I see as a little bit of a loose end here. As David mentioned, we have got a wonderful offer from some very outspoken folks who will carry a message. We have had the privilege of working with them on the dredging side. And the key there, though, I found for us was that we had a specific local message that was also a national issue. We had yes, dredging is important in Louisiana but we didn't really make the case for RAMP until we embraced the needs on the Pacific Northwest, the Columbia River, the East Coast, as well as the Great Lakes. And once we embraced on a national level on a specific issue, we could build a fairly powerful

coalition to carry a specific message. Carrying a generic message is that we need more Tim Osborns is probably not going to help us very much, even though that would solve the problem.

But what can we arm these guys with is probably something we will have to talk about a little bit later amongst ourselves is how do we arm your constituents, our constituents to also be ambassadors for what NOAA, the services. Obviously, I think the thing we heard in the last three is the response teams between Norfolk, Anchorage, and here is the response teams what most people know NOAA for, between the National Weather Service and the surveys, after-storm surveys. So what do we do with that? How do we advocate for that? How do we give these guys something specific to help us with?

CHAIR WELLSLAGER: Gary?

MEMBER JEFFRESS: I must say I was impressed with every single one of your

presentations today and really respect your compliments to NOAA. We really appreciate that.

But I have a question for Captain Grubbs. I was very impressed with your VTS system you have. And I was wondering, looking at the areal images of the barges and the large footprints that those barge arrays have on the river, why don't the barge captains have this software? Is it just too expensive for them? Is it too much training and effort for the barge captains to have the same software?

CAPT. GRUBBS: Before I answer that question, because the answer is simple, let me just say something. Everybody keeps -- there is an elephant in the room here and they keep talking around it but maybe you are talking directly on it. That is funding. You have to seize the moment. You have to seize. You can't have lazy people just hoping against hope that you are going to get money for

something.

We were successful. I was successful after the Exxon Valdez because my congressional delegation thought it was really that important to our local people to get involved.

Now, I could go back to Washington, meet Under Secretaries of Transportation who had never met a mariner in their life, and told me so, you are the first one I have ever met, why this is important. Why is electronic charting important to you? Why is surveys? And I asked so do you do lunch? Because in New Orleans -- let's get out of this office a bit and talk about this.

And when a good issue is attached to a safety issue, you saw Mike Lorino's presentation, and Sean Duffy didn't give one, but you listened to Sean Duffy of Big River Coalition in terms of monies that should be used for that type. When you seize the moment, you are a lot more successful. And

there is a bunch of people on this panel, I am sure, know the way into Washington, D.C.

Now the answer to that question is they can't afford it. We can afford it. And we demand of ourselves and the rest of our pilots the highest standards and abilities that we can get. And we intend to give them the very best equipment that we possibly can.

Now but the essence of what we have, NOAA's electronic chart, their database, that is available to everybody. AIS is available to everybody. So there is some form of it that is what I would call that common denominator between people that can afford it and maybe you can't afford the high end of this but you could afford something just as accurate. It's just money. The same thing we are all talking about.

MEMBER BARBOR: Ken Barbor. I had the same question that Gary had and let me try to rephrase it to get a more specific answer. And that is, it is enlightened that a tug or

a tow does not have an AIS. That is something obviously SOLAS class is mandated IMO through Coast Guard but Coast Guard has the ability to mandate commercial ships.

CAPT. GAUTIER: Towing vessels do have AIS. They may not have the sophisticated displays that you saw in Captain Grubbs' presentation but they do. There is a tonnage requirement over that amount which you have to have. The Coast Guard has a Notice of Proposed Rulemaking out that further reduces the tonnage requirement, as I understand it, for having AIS. So I don't know what is going to be in the final rule but I think the effort is to require more vessels to have AIS. And having ridden the number of tows, I can tell you that they love it as well because you can look around corners and you can't cheat. You can't say I am going to be at this point at a certain time and not show up.

MEMBER JAY: David Jay. I guess this is a question for all of you.

We heard from several of you that funding for dredging was inadequate. So this raises another question is what, if any, additions to the PORTS system down here would be useful, or needed, effective? You know, NOAA funding, in other words, for the NOAA side of the operation.

CAPT. GRUBBS: The question was, how would PORTS be useful?

MEMBER JAY: No. What if any additional equipment, improvements to the PORTS system would be useful to you?

CAPT. GRUBBS: Oh. Well again, we would like the PORTS system at some point, all that information, transmitted via AIS. Everybody has got it. I misunderstood the question. I thought he was asking about the high end but everybody's got AIS.

But to get that information, that PORTS information, the bridges, the Greater New Orleans Bridge, especially the Huey Long Bridge is lower, has been hit through the

years and after the Coast Guard investigates this, we all go away scratching our head. How the hell can that happen? Did you know how high the boom of that crane was? Or a ship hit it one time going down under. It scraped the undercarriage many years ago. No names but one of the crew members on the ship was stowing the boom and just picked it up while it was transiting the bridge. And he did scrape the undercarriage of that bridge.

So to get all this information and to get it quickly where it is undeniably that information that is needed and you don't have to rely on a telephone that you might not have and then after a collision, the NTSB and the Coast Guard says well let me just see who was on that phone. And what were you talking about at the time you were transiting that bridge? So you have got problems there. So you want this information coming in on your chart, on your display, via AIS would be a better way to do it. I wouldn't want to mess

up AIS. It is an incredible advancement in navigation to do that.

And I would, I would probably go a lot further to have complete NOAA Weather Stations at certain points. We have the NOAA weather forecast or the weather radar, I should say. One of our really handy pals bundle up a lot of extractions from PORTS, from NOAA, from the Weather Bureau and it is all on his laptop and they are experimenting with it. And they can see a cold front, a weather radar cold front coming through. And generally speaking if it is a cold front, you have got southerly winds, blacked out fog down below. You have got a cold front, northwest winds 20 to 30, which means there is probably not rain but clear weather. And you can see that so you will know where that clear weather really is.

Now that is all internet stuff. But for NOAA to develop a Weather Station and have that information if it is real water

depth like in the Pilottown, Venice area where it changes a lot or if there is weather in that particular area that will tell us if it is blacked out fog or not. Because you can make it all the way coming down the river, Mike Lorino said, in 10-12 hours. That is true. You can be making decisions all along the river. Is this 48, a 47-footer? Is it safe to take out? You get together they are maybe not in blacked out fog. So I have to turn it around six miles above there and wait until it clears. And you know, tug location, water depth, weather information, fog information. Again, that is Douglas' wish list but I know that cost money.

But when all the pilots and the Captain of the Port and NOAA get together and say look, what is essential for safe operation that can be better identified? You get out of my Christmas wish list into what is essential for safe navigation.

CAPT. LORINO: You know, one of

the things that I think are very important for us would be a fog sensor at the jetty end of Southwest Pass. When we get on that ship, we have no anchorages. They have anchorages coming down the river. We have no anchorages. Once you get on that ship, you are on there. You are going to go on out. So if we could have a fog sensor on the jetty end or even at the head of the Pass, that would allow the pilots -- on the station now, they can look down because of AIS, see everything in the Pass, have the weather conditions. Everything is there. But if we could have the one thing you asked me about would be a fog sensor at the head of the Pass and also on the jetty end. Thank you.

CHAIR WELLSLAGER: Rich, did you say --

MR. EDWING: So Rich Edwing with CO-OPS. I just wanted to follow-up on the conversation about integration of PORTS and AIS.

We have actually been working with the Coast Guard for several years now to do that integration. And that integration has actually been developed. It has been tested. It has been demonstrated in two locations, Tampa Bay and Columbia River. But it has yet to be implemented because the funding has not been there to implement it.

In areas where there is VTS, my understanding is that it is some software modifications to the VTS software that would allow that to happen and in areas where there is not VTS, there would have to be transmitters and things established.

We have actually recently been having some conversations with the Coast Guard about being able to offer that capability through the PORTS program. In other words, PORTS partner would be able to -- again funding would be required -- but be able to establish transmitters and so forth to allow that integration to happen. And I think this

is also a topic that is being looked at under Margaret's eNavigation committee. So I just wanted to provide that additional information.

CAPT. GRUBBS: Let me get back to funding just for a moment and we are going to talk about -- I am going to talk about this for a second, of placing a dollar sign on the safe and efficient facilitation of commerce. And I know the port does it and different people do it. But this is -- we did this here. And so I am not going to say it can be done everywhere. We have people and the equipment to do it. But that is the passenger ships. That passenger ship, cruise ship industry is so important to not just the Port of New Orleans but all of the vendors, the people who sell popcorn and cotton candy, Hurricanes, it is important. People come here, they stay in the hotels here.

Generally in bad weather or blacked out fog, the moat stuff, the tows pushing to the bank, the ships, they go to a

safe anchorage. Passenger ships are time sensitive. So we partner with the Port of New Orleans, the Coast Guard, NOAA because we need the accuracy of that S57 database and we move those ships with a Captain of the Port authorized floating safety zone with using our VTS partners.

Now, that might not sound too much to people but how many millions and millions of dollars does that mean to the cruise ship industry, the Port of New Orleans, all these hotels and the cotton candy people? Nobody has put a dollar sign on that. Those ships get to and from. They take on a bar pilot, we change out a pilot down in Venice, they go up the river in blacked out fog, if they think it is safe. Now those are the very high -- I hope I am not making Captain -- but he is learning how not to get nervous lately. Those are the high-end ships with the high-end crews, best navigational equipment, two pilots aboard in consult with one another. How many

millions of dollars does that mean? Now we really haven't put a dollar sign on that because we probably didn't need to. I mean, most people, the cruise ship people, they understand that. The Port of New Orleans understands that, getting that ship to and from. Now getting funding for what is essentially necessary, this database, that PORTS system, that turn velocity sensor, and the ability to change GNAF to where it benefits everybody out here on the move. You know, to put a dollar sign to that, I think everybody would be surprised to say oh, my God. This city, this state, this government is making a lot of money on our backs and it is because of this, NOAA right here. That is part of it. We don't go too far without our Captain of the Port. We don't go far at all. We stay right here with him.

That is all part of putting it down. How do you lobby for money? I hope I am not preaching to a choir. That is not what

I intend to do but nobody's done that yet. We do this safety, loading safety zone. The other pilots and the other groups might say you are crazy. They probably told him he was crazy for authorizing the doggone thing a few years ago. But you know what? It works because you have responsible people out there in the field, in the VTS assessing the situation every moment of the time.

CHAIR WELLSLAGER: Deborah.

MEMBER DEMPSEY: Chair, I would like to assure these stakeholders that we are getting the message. And I back up what Bill said and what David has said. We are hearing the theme about the funding for the dredging. Scott presented yesterday changing the format of our meeting going to the mountain. And why not take some of these stakeholders with us? And if we do it not on a regional basis but on a national basis, the message is going to be pretty big. We are all talking about more public awareness. You know, let's take the

public to them and make them aware.

CHAIR WELLSLAGER: It's a good suggestion.

MEMBER DEMPSEY: We are hearing you.

CHAIR WELLSLAGER: Anybody else? Jeff.

MEMBER CAROTHERS: This is Jeff Carothers.

I have been navigating a long time. I am kind of curious about the Raven system. I don't want to back off the funding but I am just wondering -- I never heard it before. Is it basically used just in this area? I assume a private company put together using all the different resources or was it a government agency?

CAPT. GRUBBS: Raven is a company out of Texas and we don't hold that against them.

(Laughter.)

CAPT. GRUBBS: I think they are

out of Austin, Texas. But there might about 1200 deep draft pilots in this country. And there is a number of thousand around the world. I want to say about three-quarters of those pilots use Raven and there is other two companies. One is ARINC.

But some of the West Coast pilots -- this is meters of accuracy because of the GPS, their GPS. They have Kinematic GPS with those really big container ships that go into LA-Long Beach with centimeters of accuracy.

So you might not hear about this at trade shows. At some trade shows you would, but not generally at trade shows. But it is available to anybody. It costs a few bucks but you know, maybe somebody could -- the software in here is incredible. This software in here is faster and better than that software in that cruise ship.

MEMBER CAROTHERS: Well I like the idea of the private companies being involved in this and taking newer products and

integrating them like that putting them out like that. I like that a lot.

Yes, that is the nuts bolts of it to me, what I saw. The presentations were all excellent. Best probably than any meeting that I have been to, these presentations.

That Raven system out there, when you taking that ship in, that is the nuts and bolts there.

CHAIR WELLSLAGER: Go ahead, Carol.

MEMBER LOCKHART: I guess -- Carol Lockhart. This is just a follow-up to the same discussion and it is more of an operational question.

But you all talked today about electronic navigation and using the electronic nautical chart and I am wondering if any of you still use the Raster Chart or the paper chart in any operations that you do.

CAPT. GRUBBS: No, we don't use the Raster. We use resurveyed. And it took

a long time to get there. That was part of -- I mean I got the money to have this river resurveyed so I know where it comes from. And it wasn't a hard battle, I can promise you that. People in Congress just didn't know much about e-charting.

What I did was I took the NOAAs and the CORS and brought them to Congress. They knew where it was. And we attached that to safety and to VTS New Orleans. If you want that safety, it is not just the people on the shore. It is everybody out there on those ships that need to have that accuracy. So no, we don't use Raster. I know there is going to be, there will probably be in NOAA maybe some argument for what they had but we use only the S57 electronic chart, the resurveyed stuff.

MEMBER LOCKHART: So I guess where I am going with this is right now we are talking about doing more with less and right now we maintain Raster Nautical Charts and the Electronic Nautical Charts. And I am

wondering if NOAA has plans to get rid of paper and Raster Charts and only maintain Electronic Nautical Charts at some time in the future as a way to save money.

ADMIRAL GLANG: The short answer is we are not looking to get rid of the Raster product because it still is very popular. I don't have the numbers in front of me but I think it is somewhere in the order of eight million Raster Nautical Charts are downloaded per year and somewhere in the order of ten million on the Electronic Navigation Charts.

The paper chart paradigm is a little bit different. Those numbers, of course, go down but there is still a demand for those. In our traveling, certainly my traveling and we did this in Anchorage where we went aboard a couple ships and you talked to the mariners, I think you are going to find that the tools that the pilots down here use and these Raven users are highly specialized tools that are not the common tool used by the

majority of commercial mariners. You are going to find many commercial ships. And I have got to be careful with the qualifier here. I was going to think of -- I was going to suggest most but I don't know that for a fact, still rely on paper charts. There is a slow transition going on now, especially through the mandation for Electronic Navigation Charts.

But even on the very high end brand new cruise ships with a fully integrated Electronic Nautical Chart Systems, the fully integrated ECDIS systems, you are still going to find somebody with a paper chart back there. It is very interesting, this transition.

So we are not in a -- we don't have any plans right now to eliminate Raster Nautical Charts. It does present a challenge from a production perspective because the Raster Nautical Chart and the Electronic Nautical Chart essentially are on parallel

production paths. So there is a cost there to do that.

CHAIR WELLSLAGER: Just a second. Susan?

MEMBER SHINGLEDECKER: I just wanted to, from the recreational user perspective, we like those paper charts. Our guys don't have the fancy electronics that you have and I want to keep my guys out of your way. So there is needs for all ends of the spectrum. So I am glad to hear they are not going anywhere.

CHAIR WELLSLAGER: Deborah?

MEMBER DEMPSEY: The good news, Carol, is the cost of that paper chart has really gone up. But it is also a requirement that these ships coming have those onboard. We frequently carry them out to the ships because they don't have them but they have got to have them onboard. Until that requirement goes away, the chart can't go away.

CHAIR WELLSLAGER: Yes, sir?

CAPT. GRUBBS: I didn't mean to screw up your entire Raster production.

(Laughter.)

CAPT. GRUBBS: I thought I was doing so good. I think Pete said I think we just put NOAA in the garbage can over here.

No, everybody, all the ships carry paper charts. They even have scanned Raster Charts. The scanned paper charts and they use that. There is a big, big difference.

When you saw Mike, Mike Lorino had an interesting presentation and you are looking at feet of difference. How accurate can you be? Well you damn sure better be as accurate as you can. You can't shut the port down and say one way traffic because they have a hundred -- in that one little area I was in you saw that 170 vessels. They had to go somewhere. Shut the port down. And I think I learned this probably from VTS part of the charge Petros and those guys, you can't just say everybody stop. That is 170 people say

what do you want me to do with these thing? So you need the most accurate bank-to-bank S57 data base that you can. There is a place for yachts and nobody wants to hit yachts. We love yachts. But they don't need, they don't necessarily need that accuracy to be able to move those two or three hundred thousand-ton tankers past one another. They don't need that.

So for our purposes, this is it. We need it. It is essential for their purposes for the guy coming in from sea. Most of the time he doesn't know where in the heck he is at in the river to begin with. He will know what mile marker but he wouldn't know -- it gets so dark out there he wouldn't know. You can measure it. It is accurate.

So there is a difference between the needs. And I didn't mean to kill the Raster program.

CHAIR WELLSLAGER: Yes, sir?

CAPT. LORINO: Mr. Chairman, I

would like to respond to Mr. Kennedy's question about the legislation and the congressional people. We have -- I have been meeting with them and had their support for about the last six or seven years on the dredging issue, the Harbor Maintenance Trust Fund, the RAMP. In fact, Monday I will be meeting with Congressman Steny Hoyer on this funding issue. But the bottom line is the Big River Coalition was formed back in 2010 here in New Orleans. It was born at the Port of New Orleans on October 1, 2010. And that Big River Coalition has brought 33 states and as of right now, 208, I think, Congressmen in favor of taking care of this Harbor Maintenance Trust Fund and using it the way it should be.

Now we all know that appropriators like to appropriate the way they like to appropriate. But the bottom line is we are making progress. We thought that would be done last year. We are working on that issue

this year. There are some new bills coming up and so if this committee would like me to go up there, I have been up there numerous times before all the senate committees talking about it. I would be happy to do it. But we are, and our congressmen and our senators are working with us left and right and we have a lot of support from around the country. So that may piggyback into something that may help NOAA along the way and that will be up to you ladies and gentlemen to decide what you all want to do but I just wanted to respond to that.

MR. KENNEDY: Thank you very much for that. And I am not part of the committee but the Council. So they certainly can take that offer up and use it however they see fit. But boy I sure hope you guys can crack that nut. I am trying to think how many years I have been talking harbor safety and Harbor Maintenance Trust Fund and it has been, I know, 20 or 25 and we keep running at it and

never get there. So good luck.

CAPT. LORINO: Well you know as well as I do, the government just takes a little time. And unfortunately, my wife is not here so I can say this, you know when I tell my wife go ahead and keep spending this money over here and I say don't spend it over there, she gets a little made at me now and then. But the same way with the government. The government is spending this money and we just need to do it and get it done. So we are making --

CHAIR WELLSLAGER: Not to break this chain of communication, but the transition into the Big River Coalition, having stated this with Captain Lorino, what better time? And with Sean here now, I thought we could take this. And when he is finished with the presentation, we could reopen to questions and work with that.

So, Mr. Duffy?

MR. DUFFY: Thank you and I

appreciate it.

I want to introduce myself and tell you how much I have appreciated being to be involved with this panel. I am Sean Duffy. I am the Executive Director of the Big River Coalition and I do wear a lot of hats but they are all related to that Mississippi River. The water from that river is in my blood and in many people's in this room. And what an excellent. I couldn't help but sit in the back of the room and one day I am going to have Captain Gautier do a Bar Pilot presentation and Captain Lorino do a Coast Guard presentation. Douglas, you can do the Port of New Orleans and Chris, I will let you pick what you want to do but I think we can all do it.

We see each other's presentations. We really understand each other's issues. And I met recently with several of you on the panel and others I know. You know, the biggest issue that I see and we continue, I

have a little bit of banter with someone who -- - of what our biggest issue is. And funding is right up there. But education is the biggest problem. It is so hard to educate people on the importance of ports, the importance of the Mississippi River.

Before the Big River Coalition was formed, I was in a Congressional office and we needed dredging money. We needed supplemental funding. And I was looked at. The Congressman said, Mr. Duffy what you have is another Louisiana problem. Well, if you haven't seen me after a couple of cups of coffee, I can be a little fiery. So when somebody told me we had another Louisiana problem, it wasn't exactly the best news I ever heard and I wanted to be able to respond like he wasn't a congressman, but he was.

So what I said to him was sir, what we have is a national crisis. You will hear a lot of different numbers. One of my jobs as Executive Director is to try to make

sure we get the numbers right. We connect 31 states to international commerce. Thirty-one states depend on the River. It was through the Big River Coalition that we learned the State of Illinois is our largest domestic trading partner. Illinois representatives came to us when we were first forming and said you are so important to us. And with that, I could go on about the importance in some of the comments. It was hard yesterday at times to sit in the back of the room because I wanted to interject but it was also a neat perspective to listen. And I will share a couple of NOAA stories and tell you why we see and why we are pleased to be here today.

Our education, that is how we educate Congress, which you know sometimes you have got to accept the fact that some of them are slow learners, if you will. But we have to explain the message. And we are reactive. We are never proactive and it is all related to funding. When we have a ship aground, the

day before we have been on the phone. We have had members of the delegation. Captain Lorino, a lot of times, has the delegation contacting him directly. And last year we couldn't get -- we had the Corps dredge and we were sitting at the dock. A dredge, sorry to my friend on the panel, he knows who he is, but a dredge that we depend on in emergency situations. And we couldn't get it released from the dock when we needed it in the river. And the honest truth is you saw Captain Lorino's presentation. Well at times last year, they were down to about 120 feet of channel in some locations.

Now the pilots know that area. They look at the surveys every day. I mean, surveys are so important to what they do. But the next morning, a ship went aground. Well guess what? That is what it took to get the wheeler down there. That is the kind of situation that we deal with all the time. We can't fix it before it is a real problem.

And I have had to explain the importance of the river over the years. But last year during the high water and we got to 17 feet because of the spillways being open and some of the measures by the Corps and a heroic job, I mean, there were predictions that the Carrollton gauge was going to go 18 feet, six inches. I got into a little bit of trouble one day when a reporter asked me what would you do if the river went to 18 feet, six inches. I said, if it is at 17.5 and it is going up, I am evacuating. I am going to treat that as a major hurricane event because I have been on the river, as the pilots were, and had seen so many of the problems.

We had people picnicking on levees that had never been down to the river. They had no idea that the pilots on the vessels were talking about what a dangerous place they were picnicking in. Because a wake from a vessel, a little bit of a boil in the levee would really have an impact.

I took my son down to an area over here, the Moon Walk. You could see it from the port yesterday, right there in front of the Saint Louis Cathedral, a shot you have seen many times on national TV when they come to New Orleans. And we almost got run over by about 100 people running. And I know some of you have heard this story but they all had their phones out. They were all recording. Okay, I look. There is a large MSC container ship going to the Port of New Orleans coming around the bend. Well the optical illusion was that that container ship was taller than the Crescent City connection. So what they were filming was impending death. They thought the bridge was going to be taken down and, of course, many of them were carrying different varieties of Hand Grenades or the famous drinks of the French Quarter. So they were shaking a little bit while they filming but they were filming.

So my son looks at me and he

thinks I know a little bit about the river and he says, Dad, is it going to be okay? I said, son, it is going to be fine. There is an air gap sensor on that bridge that after Katrina NOAA came to us and said we want to know we have this funding available. We want to know what types of sensors you need. And that was one of our first sensors, the air gap sensors there and on the Huey P., about ten miles upriver from that bridge. They were as lowest control in air draft on the river.

So because of that, I said that. And so my son kind of had a look. He started, "It's going to be okay." He started telling people it is going to be okay. Of course, everybody was filming. And then when that ship cleared the bridge, they turned around like, damn! And it is so odd but there is a lesson there. Okay? That is the kind of education that we need to be portraying. We need to be able to capitalize on a high river. But unfortunately, when we all do our jobs

right, guess what? Nobody knows. Nobody knows when everything goes right. Nobody knows when Captain Lorino's guys or Captain Grubbs' or any of the pilot groups' or Captain Gautier's restrictions save lives, save oil pollution incidents. Nobody knows that.

So what we have to be able to do is educate. And I will tell you I met with Mr. Kennedy and some other folks not too long ago. And because of the response in Sandy, we figured that NOAA was going to have some funding issues. There was a lot of funds and a lot of efforts and a lot of response there. And we know that is not cheap. And when I came back and I have told my board, you know, we have to look at this because NOAA might not be able to respond as much as they do next year in hurricane season if we don't help with funding. Overwhelmingly, everybody said yes.

And I will tell you, I have never really met Ken before but we have our conference calls and we talk all the time

because we have a lot of incidents. But honestly, there was a call this year and the Weather Service was a little late. Sorry, Ken, I know you were busy. They were a little late. Guess what? You got 100 people or more on the phone. They don't want to start the conference call until the National Weather Service gets on. That is how important that information is to us.

And with that, I would just like to say once again, thank you. This has been a wonderful panel. I asked to be able to speak because I have a board meeting I have to go to this afternoon and will be unavailable. I may be back tomorrow. But I wanted to say thank you. We get it. We know how important you are. We will do everything we can to help you with funding. As Captain Lorino said, we have some trips coming up. Members of our delegation know how much you mean to us and how much funding we need. And we are simply adding that on to our request. Thank you.

(Applause.)

CHAIR WELLSLAGER: Were there any questions for Mr. Duffy, by any chance, fiery speaker that you are?

Okay, well I guess that about sums things up right now. We are a little ahead of schedule but we didn't get a break during the presentations and I am sure several of us would like to get up stretch, get something done, water, coffee, something. I'm not really sure.

But for those that are visiting, if you would, please be sure to sign in. We have again breakout sessions tomorrow and with the breakout sessions, there will be three different sessions. There are sheets that I am going to request that you pick up about these sessions. There are bullet points that I would like you to jot some ideas or thoughts down. And I will collect these at the end of the day because we will give these to the facilitators of the breakout sessions tomorrow

to kind of guide the panel on the discussions that they will be having.

And if there is nothing else, thank you very much again for your time and insightful presentations. I have learned a great bit and it was very, very, very helpful.

I will take this time then -- Kathy, is there anything else?

MS. WATSON: No, just to thank everyone.

(Applause.)

CHAIR WELLSLAGER: We will reconvene at one o'clock.

(Whereupon, at 11:27 a.m., a lunch recess was taken.)

A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

(1:07 p.m.)

CHAIR WELLSLAGER: Welcome back. I hope everybody had a good, fulfilling lunch. It is time for our afternoon stakeholder panel sessions. But before we get into that, for those of you who are new to the afternoon that were not here this morning, if you would please sign in at the back so we have a record of you are being here or not. It would be very helpful.

In addition to that, tomorrow we are going to have breakout sessions and there will be one of three groups: they hydrographic surveying, geospatial, tides, currents, and water levels. So if you are interested in sitting in one of those, there are sheets in the back that have information specific to that and they have bullet points that you could jot some notes or ideas or thoughts on to that we will collect at the end of today that the facilitators will use

tomorrow to help direct the conversations while we are having the breakout sessions. They will start about nine o'clock and last for a couple of hours.

Other than that, this afternoon we have the Geospatial and Water Level Stakeholder Panel. We are very fortunate to have quite a variety of speakers here to address some very interesting topics. We have -- well, I tell you what. I am going to ask you all to -- I mean, please when you come up to the stage, present us with your name and a brief history of what you are going to be doing and where your expertise lie and do yourself some justice.

So without any further do, Mr. Cliff Mugnier, please.

MR. MUGNIER: Good afternoon, folks. I teach surveying, geodesy, and photogrammetry at LSU and I have been doing it for about 12 years. I did it for 20 years prior to that at the University of New Orleans

and I have also been involved in a lot of geodetic projects worldwide, of particular interest is with respect to south Louisiana.

And what we are interested in here, more than anything else, are elevations. And elevations in Louisiana are a moving target. They change. The area of Louisiana is primarily a deltaic region and we are subject to significant subsidence. The National Geodetic Survey characterizes south Louisiana as an area of crustal movement. And with regards to benchmarks, they do what they can but kind of have to throw up their hands because of the enormous expense involved in trying to keep elevations current in Louisiana because they change.

The first leveling surveys through differential levels were performed by the Corps of Engineers during the general survey of the Mississippi River in 1876. And the Coast and Geodetic Survey, the predecessor of the National Geodetic Survey, had been

monitoring tide gauges along the coast of the United States, Atlantic, Pacific, and the Gulf Coast. And the first continental datum for elevations in the entire world was that performed by the Coast and Geodetic Survey and that was the sea level datum of 1929. Since then, practically every other country in the world has used the standards and specifications established by the Coast and Geodetic Survey to design and implement national benchmark programs for the rest of the world. They have followed in the footsteps of the National Geodetic Survey.

When the sea level datum of 29 was established, it was based on 26 tide gauges along the Atlantic, Gulf, and Pacific Coasts and also included tide gauges in Canada and in Mexico. And this was based on full Metonic cycles; that is 18.67 years. There was one tide gauge in Biloxi that had been established by the Mississippi River Commission and that gauge was only had 11 years of observations.

But that was integral in the designation of Mean Low Gulf, which is the primary datum for dredging used on the Mississippi River and those areas near the Louisiana Coast.

Levels in New Orleans pretty much defined what happened in south Louisiana with regards to differential leveling first order. This is three millimeters Route K, which is extraordinarily precise stuff.

Now at the time that some of the initial surveys were being done, subsidence wasn't really recognized widespread throughout the area. Engineers recognized consolidation of soil with the earthen levees but actual crustal motion was not realized and the levels that had been performed prior to 1929 and were published in an adjustment then were subject to crustal subsidence. So the benchmarks were moving down.

Coastal and Geodetic Survey came through in 1935 and established new benchmarks. They started with the published

elevations of benchmarks that had already subsided. So there was some undue constraint placed on the new network that represented the 1935 adjustments. In '51 they came through and did additional observations. And then in '55 they tied to Morgan City and Mobile, Alabama. Well, fortunately, Mobile, Alabama is at the far edges of what we now understand to be the feathering out of subsidence. But Morgan City, which is further south than New Orleans, was subject to significant and is still subject to significant subsidence. So by starting at elevations that had previously been published but had already undergone significant crustal motion gave additional strain to a least squares network adjustment constraining to these elevations.

And then in '63 they tied to a Norco well based on a 1929 value. Norco is just upstream from the New Orleans Airport and it is the site of a large oil refinery along the Mississippi River. And then in '69 they

tied to the '63 lines.

In '73, they changed the name. They changed the name from the Sea Level Datum of 1929 to the National Geodetic Vertical Datum of 1929, NGVD. I tell my students an easy way to remember the letters is No Good Venereal Datum for '29. It kind of sears it into their brains.

Well, in 1976 Congress authorized the funding for the straightening of many of the bends in the Red River to open it up to commercial navigation. And in the process of doing that, the New Orleans District Corps of Engineers knew that they needed current elevations. So they came up with funding of one and a half million dollars to the National Geodetic Survey and NGS started at Index, Arkansas and ran first-order levels down the Red River to Simmesport, Louisiana, which is if you visualize the shape of Louisiana as a boot, then Simmesport is like the instep of the boot. And when they got to Simmesport,

then then branched out into two lines. One went down the Atchafalaya River to Morgan City and then looped up to metropolitan New Orleans and the other one went from Simmesport down the main line of the Mississippi River. When they got to New Orleans, they connected up, went to through the metropolitan area and then went out Highway 90 into the Mississippi Gulf Coast and then up to Baytown, Mississippi.

Well, when they did that, they found that the levels were unable to be closed. The observational tolerances they had were acceptable for first-order leveling but the values of the benchmarks that were already in New Orleans they were unable to close into them because of some significant subsidence. So as a result of that, they had regional adjustment after the '76-'77 levels and it was a theoretical adjustment based on what National Geodetic Survey thought might have occurred in the level lines. This was prior to the observations to establish a new

vertical datum, which is the North American vertical datum of 1988.

All of this is of interest to you folks because the benchmarks on land are what they use for offsets to determine dredging depths. So subsidence with respect to benchmarks is going to affect the accuracy of dredging for navigability of your hydrographic activities.

In '79 and '80 they had catastrophic floods in metropolitan New Orleans due to rainwater. And the local counties, we call them parishes here, of Orleans, Jefferson and Plaquemines Parishes funded NGS to re-observe benchmarks. And the Corps of Engineers was concerned with the NGS free adjustment that essentially was a theoretical paper adjustment. And they found that the new published elevations were in conflict with known differences in elevational benchmarks in the metropolitan area, sometimes in excess of three feet. So there was

something fishy in the corn patch with the adjustment.

Nevertheless, there was not sufficient funds to re-observe differential leveling throughout the metropolitan area. And it has been continuing on in this effect that NGS is constantly being underfunded from what they need to be doing to meet the needs of the south Louisiana community.

Deep casement benchmarks were introduced with the intent of having them more resistant to subsidence. They were originally developed by the waterways experiment station of the Corps of Engineers to prevent movement of benchmarks due to frost heave in the south Louisiana area. We have soils that had been deposited since the last Pleistocene. We call that the Holocene. And subsidence rates are well-correlated with the thickness of the Holocene.

In Memphis, Tennessee, we have found that Memphis is subsiding at a rate of

four millimeters a year. The Holocene is near surface area in Baton Rouge, Louisiana and Baton Rouge is subsiding at a rate of approximately six to eight millimeters a year.

New Orleans is subsiding at a rate of ten millimeters a year and near the coast where the Holocene exceeds several hundred feet, some areas of subsidence have been proven to be in excess of 27 millimeters per year.

So the movement of benchmarks is problematic because first-order differential leveling costs, on the average, $1,500 a mile. And to do reliable first-order leveling for south Louisiana, we need to start at Pensacola, Florida, run -- walk the highways to get into Louisiana and then close out in Austin, Texas, which is a bit pricey. And we are unable to justify that amount of expense currently with Congress.

So with the North American Vertical Datum of '88, they started publishing

data in 1990. But no data was available for south Louisiana because by then it was recognized to be an area of severe crustal motion.

About that time, the USSR started going south. There was no more need for ICBMs and some DoD technology became declassified. And one of the big things was the FG5 absolute gravity meter. This thing is good to non-significant digits. It is about the size of this podium. It comes with a Suburban and a geodesist.

(Laughter.)

MR. MUGNIER: Also at the same time, because of the expense of first-order leveling, Congress asked NGS if they had any bright ideas for getting elevations and re-observing benchmarks in a more economical manner. Because the Russian generals and the U.S. Air Force generals were turning the keys off at the missile silos and the satellites were increasing in density for the GPS

constellation, NGS started some research using GPS to determine that third component, the vertical component. And in a report to Congress, the National Geodetic Survey proposed a Height Modernization Program. That was approved and that is in the process of being implemented.

The problem with using GPS is that GPS does not provide elevations. GPS provides something called ellipsoid heights. And ellipsoid heights have no direct relationship to elevation. With the declassification of the absolute gravity meters, the Department of Defense also declassified the theoretical mathematical model of the earth's gravity field. That mathematical model is called the geoid, G-E-O-I-D. And the geoid is the Rosetta Stone that allows us to get ellipsoid heights from GPS and using this mathematical model we can translate ellipsoid heights into elevations. Elevations is what we all depend on. Elevations are what guides us when we

consider which way does water run downhill. Well that is measured according to elevations and the geoid, the mathematical model of the earth's gravity field. The problem with the geoid is it is still not very well known. Periodically, the National Geodetic Survey gets additional observations and makes newer attempts at finding a better and more reliable model of the earth's gravity field as it fits in the United States of America. They continue trying. They continue coming out with new versions of the geoid and every time a new version comes out, some things are improved and we then discover additional warts. So it is an example of science on the march but we haven't gotten to the final end yet.

The absolute gravity instrument is useful because it gives us an independent check on that third component of vertical. Instead of latitude and longitude, we get an idea of how much things are moving vertically

with reference to the center of mass of the earth. The nine significant digits that we get from FG5 absolute gravity meters gives us a handle on how much, for instance, New Orleans is sinking with respect to the center of the earth. We have observed absolute gravity in New Orleans in '89 and then National Geodetic Survey came back in '91. And as you can see, the numbers increased just an itty-bitty bit. That itty-bitty bit represented nine millimeters a year subsidence rate in metropolitan New Orleans. This is at the University of New Orleans. That is just between '89 and '91. Okay, they came back in '93 and '94 and again people in New Orleans keep getting heavier and heavier. It's not just due to crawfish. It is due to crustal motion.

The point to this is is that it is a consistent movement that has been going on since time immemorial, since we had land here. If we look at benchmarks that were established

from that first Corps of Engineers survey back in 1879, many of you who play golf have heard of the English Turn Golf Course where there is some big golf match there once a year at English Turn. Surveyors have gone out for me and have found benchmarks that were put there in 1879 and the ground has shrunk away from the benchmarks to the point where the brass discs are about three feet out of the ground and that is representing the approximate motion of about a centimeter a year, nine to ten millimeters a year of subsidence. This has been going on and will continue to.

We have subsidence in Louisiana due to a variety of things. We have consolidation. We have high organic content soils that because of dewatering of the near surface water table the soil will shrink. We can walk along some houses in Kenner, Louisiana -- Kenner is the suburb where the New Orleans Airport is -- and you can walk along sidewalks and houses built on slabs are

up a foot to three feet in the air. You can look underneath the slab and see the legs of children playing in the backyard. That is because the soils have subsided and shrunk away from that. But the pilings which are deep-seated and through skin friction are staying up. People who used to have garages or carports now board them in because there is a two- or three-foot step up from the driveway to the carport. This is common in metropolitan New Orleans. We find it in Kenner, near the airport. If you drove in from the east, you came through the freshwater marshes in New Orleans east, and the same type of soils exist throughout the metropolitan area, this is the Holocene, the high organic content soils and mucks that have been deposited since the last ice age.

So absolute gravity observations have been observed in New Orleans and since the Louisiana spatial reference center was established about ten years ago, in

collaboration with the national geodetic survey, we have established a number of continuously operating reference stations throughout the state of Louisiana. And many of these have been observed with absolute gravity. The agencies that have participated in that to provide us with those observations have been the National Geodetic Survey, as well as the National Geospatial Intelligence Agency.

In 2002 on the left-hand column, these primarily universities throughout the state and high schools that we have observed absolute gravity. And then in 2006, many of these were observed a second time, as you can see with the little purple indicators. The elevations, the topography, and the benchmarks in Louisiana continuously and constantly are sinking and subsiding. We can't update elevations based on first-order leveling, because of the enormous expense involved. NGS doesn't even have enough personnel to field

the field crews that they once were able to, back in the '30s, the '40s, the '50s and the '60s. NGS has been cut down to a collection primarily of scientists in Silver Spring, Maryland under Juliana, as well as some state advisors. So NGS needs additional funding to just provide the basic services necessary for flood control and elevation references in the State of Louisiana.

This is what we think may be the answer to improving the geoid. We don't have that great an idea of the mathematical model of the earth's gravity field and this is a portable absolute gravity meter. This is an A10. This thing doesn't require a suburban or a geodesists. It just takes a sedan and --

When Abraham Lincoln wrote the emancipation proclamation there was a footnote where slavery was still allowed as far as graduate students were concerned.

(Laughter.)

MR. MUGNIER: And all this really

needs is a graduate student, a sedan, and an A10. This is an absolute gravity instrument that is intended to be used outdoors. And in one validation run, the National Geodetic Survey has used this type of instrument to run from Corpus Christi, Texas to Austin. And this instrument was used in conjunction with a GPS receiver and this other thing, which is a zenith camera. And a zenith camera is used at night. It looks straight up, based on local gravity, and takes a picture of the stars and it uses a CCD ship to image that. And with the software that is written in Switzerland, it recognizes the stars, computes where they are with respect to the zenith camera, and then determines where they are with respect to where they are supposed to be. And the difference between the two is the angle or deflection of the vertical, due to variations in the lumps and bumps and slopes of the gravity field or the geoid.

So GPS receivers, a zenith camera

and an A10 gravity meter represent the basic instrumentation that is needed in Louisiana to observe a grid approximately according to the geodesists of NGS, observe on a grid of about 40 kilometers. And by doing that, it is hoped that that is the final key that will give south Louisiana and central Louisiana a more reliable geoid from which flood elevations can be certified by local land surveyors based on GPS observations, since differential leveling is realistically impractical -- is not practical.

In one area in New Orleans East, the late Professor Roy Dokka set up a couple of GPS continuously operating reference stations about 15 feet apart. Our local United States Senator is Senator Mary Landrieu. Her father was once a mayor of New Orleans, Moon Landrieu. And the two stations, Moon and Mary 15 feet apart. One is on just a concrete pad, which is a surface mark, and about 15 feet away there is I think a 700 or

800-foot steel well casing that the antenna is attached to. And this is showing the rate of subsidence in millimeters over approximately the past year. And it is showing just a consistent subsidence rate just at one point where daily we can look at that and see how Moon is subsiding with respect to Mary in New Orleans East. So we have got a daily track on subsidence, in addition to the periodic observations that are done with GPS showing differences in ellipsoid height, which is what this is, variations in absolute gravity, and the occasional rare first-order leveling.

What I think all of this implies towards this panel is that when you are looking for elevation control for dredging to maintain navigability, you have to come off of benchmarks. And this is the sort of stuff that you are going to need for your area of interest as well.

Are there any questions?

CHAIR WELLSLAGER: Actually, if we

could hold the questions until after everybody has had a chance to speak, I think that would be beneficial.

MR. MUGNIER: Yes, sir.

CHAIR WELLSLAGER: Thank you, though. That was very informative.

(Applause.)

CHAIR WELLSLAGER: Randy? Randy Osborne, were you going to speak next?

MR. OSBORNE: I'm Randy Osborne. I run the BRS network for the State of Louisiana. It is a network of continually active reference stations that are monitored 24 hours a day and we use this infrastructure to monitor subsidence and crustal motion studies.

(Pause.)

MR. OSBORNE: And I was honored to work for a great man, Roy Dokka, and he basically told me I could do this stuff and I had no idea what he was talking about. And he kind of made it simple for me. He said this

is just waves. We are just taking waves and we are looking at waves. And I had a background in audio so I am like oh, you mean like sound waves? And he was like kind of sort of.

So, I embraced the opportunity to start using this network software to tie all this infrastructure that was already in place to do the science together. And what we ended up coming up with was not unique. It was just a tool that was being used all over the world to provide a network solution for end users to get active positions in real time. And the network that we have has 66 active stations that monitor the GPS positions and then by tying them into a network solution, they can get that information in real time as a rover in the network anywhere with inside the stations that are located throughout the state. In one second, they can get a position that is good to two centimeters horizontal and four centimeters vertical. By standing there

longer periods of time, three to five minutes, they can get observations that are equal to about four or five hours of autonomous positions that have been post-processed. So it saves them a lot of time and money in the long-run.

So in the wake of that, Roy had the vision of coming up with a way of making people be on the same page. And in order to get on the same page, everybody had to be playing by the same rules. And so he started by defining the rules. And one of the rules was coming up with a push from the legislature in Louisiana to develop a state statute for vertical control. And that state statute is currently in existence. It is state statute 50:173.1 and it says that you basically have to use NAVD88 as your vertical control. And NAVD88 is only realizable if you have a good geoid on top of your ellipsoid measurements.

So we are able to measure ellipsoid heights very accurately down to a

centimeter in real-time but what we have a problem with is this geoid that just came out. It has different qualities, depending on where you are at. And one of my colleagues, Josh Kent, he is here, he did a lot of analysis on the last geoid and we found discrepancies between the last geoid and the new geoid to as much as 70 centimeters in certain areas. So it is hit and miss, depending on where you are at. And a lot of the guys that have been doing this a long time are not comfortable using the current geoid because the differences where they are at may be three or four feet from what they are used to seeing on the prior geoid. So the real truth is is the new geoid could be nailing it and giving them an exact actual measurement that is right dead-on or it could be anywhere in-between there and where it used to be.

So that is the uncomfort that they currently have because by law, in Louisiana they are being required to provide their

elevations in NAVD88 and the only way to get there is to use that geoid.

So this is a problem. And NGS has this geoid problem for the entire continent and, in certain parts of the continent, this thing works great. For us, not so much. So we are kind of an outlier and Cliff illustrated why it is a big problem. But what we deal with on a daily basis at Seaport G is listening to the guys out there doing the work complaining about how come they can't get an elevation certificate on a place they went to last year and it is off by a foot and a half this year just because the geoid is different. And so we don't have a good answer for why it is different, other than the fact we don't know what the truth is yet. And so we need more work. We need more funding to get better answers.

And the project that Cliff illustrated for getting the geoid refined would help us get there. Because the

ellipsoid height is pretty tight. It is down to probably a centimeter in real-time but the geoid is where the problem lies right now. We have a lot of uncertainty in that geoid. And what it equates to is this is actually the real-time network in action and I am going to turn off the station and let you see there is actually rovers out in the field doing work right now and each one of these little antennas you are seeing is somebody doing surveying. You can even see a guy offshore. And the reason he is able to do that is because we have CORS station located on platforms in the Gulf that keep them inside the box. So they can work inside the box and then go up to as much as 70 kilometers outside the box and still get good information in real-time. If they are not able to work in real-time, you see a couple of red antennas, those guys could be collecting data for post-processing and they can use this information that is tracked from each one of these

stations after the fact and generate solutions with those processes. The difference is, you have to collect a lot more data to do the post-processing. So that costs you more time and labor.

And the project that Cliff illustrated for getting the geoid refined would help us get there. Because the ellipsoid height is pretty tight. It is down to probably a centimeter in real-time but the geoid is where the problem lies right now. We have a lot of uncertainty in that geoid. And what it equates to is -- this is actually the real-time network in action, and I am going to turn off the stations and let you see there is actually rovers out in the field doing work right now, and each one of these little antennas you are seeing is somebody doing surveying. You can even see a guy offshore. And the reason he is able to do that is because we have a CORS station located on platforms in the Gulf that keep them inside

the box. So they can work inside the box, and then go up to as much as 70 kilometers outside the box and still get good information in real time. If they are not able to work in real time, you see a couple of red antennas, those guys could be collecting data for post-processing and they can use this information that is tracked from each one of these stations after the fact and generate solutions with those processes. The difference is, you have to collect a lot more data to do the post-processing, so that costs you more time and labor.

So what they really want to do is rely on this real-time solution and the key to being able to rely on that real-time solution is having a good geoid model.

So that is what we are really here to talk about is how can we get there from here and how NGS can get the funding to help us realize that goal, because we need it by state law. And the reality of it is: today

the guy that is out there doing the work can't get there from here because he doesn't have the tools necessary to do it even though the law says he has to. So that is a difficult position to be in, if you are a guy out in the field doing this kind of work and the state law says you need to be using NAVD88, but you can't realize it because the tools aren't in your hands.

And that is about all I have. I will be up here to take questions about the network if anybody wants to know more about it. Thank you.

(Applause.)

CHAIR WELLSLAGER: Thank you, Randy.

The next speaker we have would be Robert Turner.

MR. TURNER: All right. Well, thank you very much for allowing me to come here and talk to you all today. As you heard, my name is Robert Turner. I go by Bob. I am

currently the Regional Director for the Southeast Louisiana Flood Protection Authority - East.

And for those of you who are not too familiar with this whole thing with levee districts and levee boards here in Louisiana, shortly after Katrina it became apparent that we needed to change the way that we do business when it came to flood protection, particularly with regard to things like levee protection. And we needed to move away from a very parochial perspective when it came to flood protection, whereby each individual little jurisdiction took care of a section of levee that was contained within their area. But then no one was looking over the big picture to see that all those segments, which are eventually attached, make sure that those things operated as a system. Because if any one of those segments or pieces did not work properly, then obviously the whole system would not work properly and someone was bound

to flood.

And so back in 2007, the Southeast Louisiana Flood Protection Authority came into being. They are the governing board now for the three active levee districts on the East Bank of the Mississippi River in the metropolitan New Orleans area. So that is St. Bernard Parish, Orleans Parish, and Jefferson Parish, and again, all on the East Bank. And we have a sister authority, the Southeast Louisiana Flood Protection Authority - West that is on the West Bank.

My background, I am a professional engineer by trade, registered here in Louisiana. And basically, started out in the consulting business too many years ago to tell you exactly when. And I spent some time as a public work director in one of the parishes and then ultimately wound up as a director of a levee district and then finally here, where I am at today, as a regional director. So I have a little bit if experience when it comes

to some issues that are dealing with levees. And the thing that I am going to talk about today is this whole elevation issue with respect to this new system that we have.

And our responsibility involves the East Bank of the river and particularly about 200 miles of levees that are contained within our jurisdictional area that formed the East Bank side of the Hurricane Storm Damage Risk Reduction System and provide other types of protection, for instance, interior drainage protection with some of those levees as well.

I suspect that most of you all know that the bigger part of this system is being constructed by the U.S. Army Corps of Engineers, the entire system to the tune of about $14 billion or so, of which the State of Louisiana and perhaps even the local levee districts will have to participate to the tune of about 30 percent of the cost of that original construction. But nonetheless, the majority of that is being borne by the U.S.

taxpayers.

However, once the system is complete and as it is being completed in segments, the federal government turns that over to us, to our levee districts and to the Authority East. And we are then charged with operating and maintaining that system. Two very important words there, operating and maintaining. And I am going to talk a little bit about that in a minute as it relates to elevation.

But this morning I was here and I saw the Captain of the Port, Captain Gautier, talking a little bit about some of the risks associated with the system. The gentleman over here asked him a question about the Inner Harbor Navigation Canal Area and his response was very interesting. It is clear to me that he now understands the risks associated with providing flood protection in this area and that it is a coordinated effort amongst various agencies and partners.

And what he said was, you know, we have to achieve operational excellence in order for us to be successful in our flood-fighting activities. Not just flood-fighting excellence. I think what he said was we had to achieve operational perfection. Okay? And that is a pretty lofty goal when it comes right down to it and we really have to strive to do that in order for us to be able to do the best that we can.

Now we know we can't achieve perfection. And there are certain things we are always going to be at risk for. But there are other things that we can do to get a little bit closer to the mark and one of those things has to do with the way that we operate the system and the way that we maintain the system.

The operational part, you know, we use the words `operation and maintenance" together so many times in the levee business that people forget what the difference is.

But the operational part is when we actually start going out and doing things in advance of and during an event. Whereas, with the maintenance side of things, maintenance is just the day-to-day activities that take place, the inspections, the repairs and things like that. But the operational part are the things that we have to go out and do in response to something that Mother Nature is sending our way. And so it is critical for us to be able to react in the right way so that we can put our resources where they need to be and so that we don't require things to happen that is going to create a great deal of inconvenience and expense to the nation or to us locally that we don't necessarily have to do if the event doesn't call for it.

And so in order for us to have a pretty good idea of how we have to react to an event, this whole idea of elevation is extremely important.

The trigger points that we use to

tell the navigation people, "Okay, it is time to leave, you have to get out of the Inner Harbor Navigation Canal Corridor, nothing else can come in." It is based on water surface elevations, primarily. And even more so than that, it is based on forecast water surface elevations. Okay, so you have got a little bit more of uncertainty there. So you have got the uncertainty of what the actual elevation is at any point in time but now you are trying to forecast that out into time. You have got to be able to err on the side of conservatism but at the same time, be reasonable in your approach in how you go about requiring these big changes that occur in the system.

Also you have to, once certain elevations are met from the water surface elevation perspective, you have to take certain actions within the system. The navigation gates have to be closed to close off waterways. Flood gates along the levees

and flood walls have to be closed, starting with the lower elevations and then working your way up. Various parts of the system have to monitored more closely. All of these things are important. And so it is extremely important for us to understand what the relationship is between the elevations of the water surfaces that are occurring as an event approaches and the elevation of the system itself and the various components of that system.

One of the problems that we have had recently and really came to light in Tropical Storm Isaac was this whole idea of being able to know what is happening in the system as a storm approaches, and as a storm is upon us, and as the storm is leaving. When we go through and we take a look at the various things that we did to react to that storm, one thing that we relied on heavily was the actual real-time water surface elevations that were available to us through either NOAA

or the U.S. Army Corps of Engineers and the various websites that were out there that track that and report that out. And we make decisions based upon what is coming out of that.

There is a couple of problems, however, that have come to light and because now our system is much more complex than it has ever been and because we have to place more and more reliance on the availability of this data and the accuracy of this data, we are now finding out that things need to be changed. Certain things need to be changed.

And why is that? Well, we had some gauges that were measuring various water surface elevations in the system that, in some cases, went out completely 12, maybe 24 hours before the storm ever came. So we lost that ability to monitor that water surface elevation remotely. And what that required in some cases was somebody strapping on a raincoat and a life jacket and driving out in

the storm to go take a look at a staff gauge somewhere.

The other thing that we found was that some gauges were reporting information, but it wasn't accurate. And so we started getting, for instance, I think it was on the 17th Street Canal, we started getting elevations in that indicated, wow, the water is getting way too high out there. Maybe they need to stop pumping. And it generated a whole series of calls to the Corps of Engineers and to the Sewerage and Water Board and what is going on. Come to find out, everything was fine but the gauges were telling us that everything wasn't. And, you know, just the opposite could have happened. We could have been looking at the gauges thinking that everything was fine but really it wasn't.

And so it is extremely important that we have a system that can accurately and dependably give us the information we need

during a storm event. And it has to be related so that the gauge information, the gauge datums or the zero points for the various gauges throughout the system are all at the same zero point so that when it is reading two foot here and one foot over here, I know the water is falling in that direction. And it also has to be related to the elevation of the flood protection system itself. And that is why we have taken the step of saying any work that is being done in our system, it has to be done on the NAVD88 datum so that we are consistent in that approach.

In addition to that, however, with regards to these gauges, we have opened up some dialogue with Tim and the National Weather Service and with the State of Louisiana and others to try to figure out a way to harden some of these gauges in very strategic locations. We see this as an extremely important component of us being able to successfully operate this system in the

future. So that is one of the big things that we are looking to do.

I'm not going to talk about too much else here because I have one of our Commissioners here, Mr. Estopinal. He is going to follow up right behind me. So, Steve, do you want to come on up?

(Applause.)

CHAIR WELLSLAGER: You want to use this mic?

MR. ESTOPINAL: Oh, I could probably project to this room fairly easily.

CHAIR WELLSLAGER: Actually, the court reporter needs you to speak into the mic.

MR. ESTOPINAL: The court reporter needs the mic? Okay, I will stay as close to the mic as I can. I have a mobile here. It's show time, folks.

My name is Steve Estopinal. I am originally from St. Bernard Parish. I am a civil engineer land surveyor and I have been

struggling with the non-conformity of vertical datum in south Louisiana for five decades right about. Right about.

You know, one fellow was talking about his friend from Chalmette. Yes, you know they are known as Chalmettiens. I lived in Violet. I was a Violatien. That is exactly right. And I am here for comic relief, because I think we need a lot of comic relief.

We are going to talk about rectifying the CORS network. We have some of the greatest science in the world when it comes to determining ellipsoidal heights: the position of a place in reference to the center of the earth.

But after Katrina, which is why I don't live in St. Bernard anymore, by the way, we have a performance evaluation. It was done by the Corps of Engineers. A very interesting read. I like this because of what is on the picture on the cover there. And I have got to

admit, that is not a real good depiction of what actually happened. What actually happened was a lot worse.

We also have another document that I think if you ever get a chance to read, this is done by Woody Gagliano. I met Woody Gagliano in the '70s when he came to my office to talk to me about the problems we were having with non-conformity of vertical datum.

Here is a geological study of south Louisiana showing all the faults. And you can see there are a lot of fault lines running. There is a lot of places where there is changes in elevation. There are a lot of salt domes, where there is differences in density of the surface of the material. It looks pretty complex. It looks pretty bad. But really the truth is a lot worse than that.

Traditionally, we controlled our elevations -- and I am at the cutting edge of the application of vertical datum, land surveying. And we would rely upon benchmarks

because we didn't know how the world was and the National Geodetic Surveys would give us these marks and we would measure from them. You notice that this brass marker is a little dented right here? When they are really hit real good, they will fold over. And my son had a name for that. He would say it was a taco. So when he called up and he said, "Dad, I have got a mark out here, but it is a taco," he meant it is one that got beaten up so much that the brass had actually folded around the top of the mark.

But this is traditionally what we do. And you can see that there is a difference between the mark and the surface. And you can say, well, that is the result of subsidence. Yes, but the truth is really worse than that because this mark is also going down. So this difference here is just the difference in the subsidence from the surface to the deep rod mark. The actual elevation is going down even more. And we had

hopes that GPS technology would get us away from this non-conformancy of datum. We thought, "This is it. It is satellite. It is rocket science. It is going to cure us of all our problems."

Well, we started discovering some things. We started discovering that, depending upon what ellipsoid was applied or when they change the geoid, we started getting different elevations. There is changes. If we went to mark and we measured it under 99 geoid, it was here, 2003 here, 2009. What we are trying to get to, we are trying to get to that old thing back in 1929 we used to call a sea level. That means equipotential gravitational surface. Right, that is the gold standard. If we had that equipotential gravitational surface, if we know where it is -- and water doesn't have a problem knowing where it is, water figures out gravity real good. If we can figure that out, then maybe we can predict, apply some of these wonderful

predictions to real-time situations.

And this is a little thing showing -- it is hard to present this in a way that doesn't make you kind of glaze over. The ellipsoid is a theoretical surface that the satellites do a real good job of defining where it is. They can tell us where this is. Centimeter level. This is the surface of the earth, the topography. We know where that is. We are standing on it. The big fly in the ointment is this, the geoid. And the geoid is what we call our datum. We would like that geoid to be an equipotential surface. We would like it to be where the water wants to be because that is what we are concerned about. The problem is finding out where that geoid is. And it has been very difficult, because essentially there is a whole lot of problems with figuring out.

Here is the equipotential surface. That is where the water would get. That is where we want our scientists to concentrate

on. That is where we are interested at the levee board. We want to know on the levees where this water is going. And NGS and their geoids have tried to duplicate where that is with geoid `99, geoid 2003, geoid 2009, et cetera, et cetera, ad infinitum, ad nauseum. That is all the Latin I know. We will have to go to something else.

All right. What brought this light to me was at the Southeast Louisiana Flood Protection Authority. We had a construction known as the Great Wall of St. Bernard. How many people have seen the Great Wall of St. Bernard? It is fantastic. It is one of the engineering feats of the world. And a lot of people spent a lot of their money to put that wall down here to protect Southeast Louisiana. That whole wall which is like 23 miles -- when I say something wrong, Bob, you correct me.

It was all based upon one controlled benchmark called TED that the Corps

of Engineers established out there. And I am the last guy to be critical of the Corps of Engineers, but to have 23 miles of levee based upon one benchmark seemed to be unwise. But it doesn't matter. It is what happened.

One of the things we noticed that when the Great Wall of St. Bernard met up with the surge barrier, there was a differential of about four and a half inches vertical. They didn't meet. Okay. What kind of problem that is, I don't know. Initially, there was a lot of screaming and running around in small circles, things like that. But then things settled down and the Corps finally decided oh, no, everything is fine. It's okay.

But we decided that we were going to verify that elevation. You know, we are the Flood Authority. That is part of our responsibility. So we hired our own surveyors to go out there and they did static observations, showing the values that were shown for TED and they were very consistent.

And I'm thinking, well, you know, that is not bad.

So then we used real-time network, C4G, and then this is a commercial vendor. And we got four and a half inches different. All right, well, maybe that is a problem.

So then we looked at the values for TED and we noticed the small print. You know, everybody should read the small print. Believe me, read the small print. The standard deviation for the value associated to that mark was plus or minus one decimeter. That standard deviation for that mark was plus or minus one decimeter. How much is one decimeter? About four inches. All right? And that is the standard deviation. That means 32 percent of the chances are it is outside of that. As a surveyor, what I am responsible for when I do the work, I have to do it with a 95 percent confidence level. That is two standard deviations. And yet here we had I don't know how many billions of

dollars. I don't know. It is like Monopoly money. It really doesn't mean anything anymore. And it was all based upon something where the standard deviation was one decimeter. And we are over here talking about, we are worrying about surge miles and whether it is going to go over and whether we are going to close the gate at 1.0. No, maybe we ought to close it at 1.2.

That is crazy. We are already outside of that with our standard deviation. So then maybe we do some refining and stuff like that but it got worse than that.

What happened then was we came in with geoid 2012, which was supposed to be a refinement of the geoid and it probably was. It was a refinement of the geoid. And 2012 had a lot of differences from 2009. Well, we are okay. We are used to these changes. In the surveying profession, we are used to changes and vertical changes in benchmark values all the time. They would change from

one geoid to one ellipsoid. It is like being nibbled to death by a duck. I mean, it is just all these little change, change, changes.

And as soon as 2012 came out, LSU went out to a couple of sites that had gravity readings and they found some significant difference. That one speaker talked about, what, 70 centimeters? That is 0.7 meters. All right? Well, that was how much one was above or was below. I forget. There was another one that was 0.3 in the other direction. Let me see, 0.3, 0.7, that is a meter differential. A meter differential in the vertical datum within the same state on the same toe of the same boot. A significant problem. A significant problem. And we are here. We are going to try and protect the City of New Orleans from flooding and we are negotiating on whether we should close it at water elevation of 1.0 or 1.2. It is insane.

We need to have a better grip on this vertical datum. We have to have more

information so that NGS can give us a good geoid, a geoid that is really close to that equipotential gravitational surface that water knows about without having to ask anybody.

There is also a whole bunch of coastal restoration projects going on. I threw this little slide in there simply to show you how everything can be effected by not having a good grip on the geoid, by not having good information on that equipotential gravitational surface that we all need to have in order to plan things.

Let's say we had at year zero all the science -- and we have got some of the best scientists in the world examining our coastal region and planning coastal restoration projects. These guys are really into it. I mean, they know their stuff. So they go out and they measure it. They measure the surface of the water and they get the tide gauge readings. And they say all right, this coastal restoration surface we have to put

that new surface in at 1.2. A couple of square miles of surface. Right? We have got to have it at 1.2 so the grass will grow, so the birds will lay their eggs, so the fish will swim and all is right with the world.

Five years later when they go in to build the project, the benchmark that they related all their information on to collect the data has moved down. So you say, "What is the big deal? We will just go ahead and get another value on the mark." Well, let me see. This was done with geoid '99, this was done with geoid 2009. How do you relate those changes and what are those changes? And are those changes consistent?

We talked about Moon and Mary and how they are settling the differential rates in the University of New Orleans. Is it 19 millimeters a year?

MR. MUGNIER: Nine a year.

MR. ESTOPINAL: Nine a year, okay. That is only at New Orleans.

You saw Woody Gagliano's little chart there. That's not the same everywhere. It might be moving that fast down in the City of New Orleans -- I mean, over at the University of New Orleans but I tell you what, it is moving at a different rate in Venice and I don't mean Venice, Italy. All right? It is really trucking down there.

And so these changes are all convoluted until we have a pollution of data. And these scientists are trying to build a coastal restoration project when the data coming in is already polluted beyond belief. So they go out and they build their project and they build it on the benchmark and they revise the values of the benchmark and still the project comes in too low. And what do you have? You have a failed restoration project and you have got another $12, 13 million just thrown away, washed away, turned into nothingness because we don't have a good vertical datum.

So what am I here asking for? Well, we need to have a Louisiana geoid developed where we can put in marks across the state, add up 40 clicks spread -- 40 kilometers, 40 clicks. We put these marks in. We do positional readings on them so we can get good GPS positions, we can get good ellipsoidal heights on them. We put gravity meters on them so we can get good gravity readings. We put the zenith camera on them so we can get a good idea of where these gravity lines are leaning because we have got salt domes all over the place. And one thing about a salt dome is, it is nowhere near as dense as anything else. And so it distorts your vertical.

So this geoid that we had that was working real good across the rest of the country gets warped here. Of course it is even worse than that because that geoid is also tied into surface marks and so it has been constrained. So it is not even fitting

bad well.

It is hard to explain it, other than to say is what we would like to do is have a program of establishing good control across the state of Louisiana where we can get good absolute gravity meter reading so we can develop that good geoid which really actually follows the equipotential surface, so that when our scientists do scientific studies, when our coastal restorations projects do coastal restoration studies, and when our flood gates are closed at a certain elevation, it is all working off of good, solid science that is repeatable, that is dependable, and is based upon the real world and that is it.

And I think I am the last guy? No, I am next to last. Okay. Thank you very much.

CHAIR WELLSLAGER: I think our next speaker is Henri Boulet.

MR. BOULET: Henri Boulet. Good afternoon. Can you hear me, everyone? Okay.

My name is Henri Boulet. I am from southwest of New Orleans, about 60 miles from a Parish called Lafourche, which is along the Bayou Lafourche distributary that goes all the way up from the Mississippi River at Donaldsonville down to the Gulf of Mexico.

And Tim asked me to talk a little bit about how our community, which is very rural, has utilized some of the resiliency programs that NOAA has offered to determine sea level trends right along the coast and subsidence and how it is impacting our community.

I am Director of the Louisiana Highway One Coalition, which is a road that followed Bayou Lafourche going down to the coast and we are working on securing that highway because it is just at about two feet above sea level. So you can imagine when a hurricane gets into the Gulf all the way down by Cancun, we are already seeing higher tides that impact a very important highway to the

nation.

And that highway leads down to Port Fourchon. And here you can really see the areas of the highway we are trying to raise is from the last levee community where there is a U.S. Corps levee at Golden Meadow coming down 19 miles to Port Fourchon, which is right on the Gulf.

And Port Fourchon supports anywhere from 16 to 18 percent of the nation's daily energy needs. It not only services most of the deepwater activity in the U.S. Gulf of Mexico, both in the east and west and central gulf, it also supports LOOP, which is 18 miles offshore, which is the Louisiana Offshore Oil Port. And it is the only offshore oil port the nation has that is capable of unloading the very large crude carriers, a million barrels of oil a day.

So basically, they dock offshore and a pipeline pumps it in 18 miles to Fourchon. There is a booster station at

Fourchon which builds up that pressure to get the oil further north to salt domes under the ground, and then eventually it goes up to refineries all along the river. And LOOP is connected to 50 percent of the nation's refineries.

So LA-1 is very important to the nation. This is our poster child picture of how it looks from that levee up in Golden Meadow for 19 miles south during a hurricane. And this was during Hurricane Rita. Obviously, the road is anywhere from one to four feet under water. Our concern in the community is that we never know if we are going to have a road still there after the stormwaters recede. It all depends on how quick the water comes up. If the water comes up slow and those waves just eat at the roadbed, we could have the entire road wash out, which would really present some problems for us and it would certainly present some cascading economic impacts for the entire

nation as the energy markets would respond to Fourchon not being available to reactivate all of the energy in the Gulf that gets shut down before the hurricanes make landfall.

This is how it looked this summer, that same view, just with a Category One hurricane, Hurricane Isaac. And what we learned from Hurricane Isaac is even these milder storms are shutting our road down for longer and longer periods of time. That is because our road, like the discussion has been much earlier, is subsiding at a great rate. It is also subsiding at nine millimeters at year.

What we have noticed through storms that have closed down the road is that since Katrina coming down all the way to Isaac, our road closures have been getting longer and longer. Why? Because that road has obviously sank a little bit more. It takes longer for that storm surge to go away that built up against that levee. And the day after the hurricanes, LOOP is wanting to get

back in business. The oil companies are wanting to get back to Fourchon because the refineries are running shard and you are seeing prices go up all over the nation. So everyone is calling and saying, "When is LA-1 going to be open?" It all depends on how the storm came in, how quick the winds die off and the water recedes back into the Gulf of Mexico.

But what we also noticed this summer for the first time is how many areas in our road really got gashed. We have never had this type of destruction. We had 21 washout spots in the road that we have never had before. And I believe that is an indication that there is less wetlands between the Gulf of Mexico and the road itself to be a barrier and slow down that destructive wave action. So we just had waves beating into it. You may recall that Isaac kind of slowed down as it approached Grand Isle and that was the worst-case scenario for us.

So 13,000 tons had to be hauled in to repair the road. They just kind of did a temporary repair. It is going to get some new shoulders on it come February before next hurricane season, because the states realized that maybe with the shoulders being blacktopped that will be additional protection for the roadbed itself, under the two lane which carries the vehicles.

This is just another photo to show that it actually in some places went all the way to the centerline.

Now this is actually south of Port Fourchon where the road continues on to Grand Isle, where the road really took a beating. So for quite a while in Grand Isle, you could only get in and out at very limited times during daylight. The state had to close it. They had to monitor traffic. But now it is all back open.

The reason again LA-1 is so important is because America's busiest

intermodal energy port sits at the bottom of Bayou Lafourche right on the Gulf. That is Port Fourchon.

What you are looking at here is about two billion dollars of dock infrastructure. And at any time, you might have another billion dollars in vessels that are in the port. And you know, you have the Walmarts of the offshore industry with facilities that boats can back up under and can concurrently load groceries, waters, special fuels, drilling muds, pipes, everything you need to sustain life on one of these rigs that may have 250 people on it. And the efficiencies you get with that is that if you are having to lease these boats for $30,000 a day, you certainly want that boat to be able to go into a port that in eight hours can concurrently load everything you need, rather than going to another port where the boat has to go to the public water dock or a pipe-loading dock or a mud-loading dock and

what not. That extra hours you spend at other ports may cost you 20 grand just on that one boat for one day. So when you multiply it times a fleet of 400 vessels servicing the deepwater Gulf, the efficiencies you get by utilizing Fourchon is tremendous and eventually that gets passed on to us as consumers because it is a little bit more of an efficient operation to service that offshore facility.

Fourchon is continuing to expand with new technology in the deepwater. They are building a new 7,000-foot slip here. And basically they dredge in open water and create the slip and they just pump the material in the sides to create the docks. And then they build industrial-type bulkheads that cost about $7,000 per foot to construct.

They already have much of this leased out and they are two years away from bulkheading it. But there is, as I said, the technology is changing in the Gulf and there

have been some tremendous discoveries of domestic energy out there.

As a community, we know we need to protect Port Fourchon, besides securing the road that goes to it. And we are starting to -- Fourchon is right here, actually, and the bayou and Highway 1 comes down. The state and the Corps are going to begin building a headland project. That is a 13-mile dune along the coast. The port has done some interesting things in using old grain barges and providing breakwaters that have worked very effectively to protect the port right on the Gulf. In fact, when you fly over it in a helicopter and you see where the breakwaters are, you can see the beach comes out to that point. And where the breakwaters are not, it is just massive open water beyond that. So they are trying to protect the port in the most efficient way that they can.

The road also, as I mentioned, leads to Grand Isle, which on a weekend can

have anywhere from 20 to 25,000 people on it who go down to Louisiana's only inhabited barrier island. It plays a tremendous role in our offshore fishing industry. It also serves as a base for a few offshore companies. But the only way in and out to Grand Isle is again, LA-1. So LA-1 not only is important for this nation's energy security but it is an evacuation route as well for residents or workers at the port and for up to 10,000 offshore workers.

And you know the challenge, when these storms come in, that the oil companies have to gauge is getting their people flown into Fourchon to get their cars, drive it north on LA-1 before the road is inundated to the point that the saltwater just comes into their cars and they get trapped.

We have had some storms where the evacuation was a little late. People just had to be flown further in and we had several hundred cars that didn't make it out and

unfortunately were ruined by saltwater.

You know when we tell our story in Washington, we felt we needed a federally authored study to have the government understand the criticality of Louisiana Highway 1. So the Homeland Security sent down a crew from their NISAC lab out of New Mexico, and that is the National Infrastructure Simulation Analysis Center, and they have these economists that say, "What if this road got washed out and we couldn't get to Port Fourchon for 90 days?" Because it would take 90 days to build another road capable of handling 600 18-wheelers a day that go to Fourchon to bring commodities for the offshore drilling industry. What would that cost the nation? How would the energy market react?

Oil companies, what would you do if your road got washed out? Well the Shells, the BPs, the Chevrons said, look, you know if that kind of storm came in that did Katrina or Rita damage and additionally washed out LA-1,

we would just shut down all our exploration and repair the rigs that may have been damaged during the storm because we are under BOEMRE's eye to get those structures repaired so there are no leaks, of course, and there are no spills. But what that does is that would put off exploration and royalties to the federal government ten years down the road for quite some time.

Because when you are exploring and you lease these leases in the Gulf, it may take ten years for Shell to get the first drop of oil out of a lease that they have. And the government is counting on these royalties down the road, so it backs up royalties. Basically, they said there would be a $7.8 billion loss of GDP if we had Louisiana Highway 1 shut down for 90 days. And you know, that is from a reduction in 160 million barrels of oil and 320 billion cubic feet of natural gas.

And you know, they looked at all

the other ports and say well, some people say, "Well, move Fourchon. Go further inland." Well, you just can't move $2 billion of infrastructure. You know, no coastal city has that kind of money to invest right now. You know, the environmentalists would scream and say, well, we don't want all those boats at our port or coming further inland. And besides, there is only 25 percent of the crane capacity at Fourchon in all the other ports combined along the coast. You need a certain type of crane capacity to service oil and gas. It is not a container-type crane. You need a certain type of cranes that can load drill pipe, specialized containers and what not.

We also engaged NOAA to do an inundation study of LA-1. And really looking at with subsidence occurring in our area at about 9.24 millimeters a year and looking at the elevation of LA-1, and it has some low spots, but when the low spots get inundated, state police say, "We are closing it." It is

just too dangerous, because you can't tell where the road is and where the marsh is and vehicles would just drive off at an alarming rate.

So they looked at the lowest five percent elevation of the road, and I really want to compliment Tim Osborn and Steven Gill at your CO-OPS division for saying, okay, we have to get this out of the lowest five percent from the state, from the most recent technology that they have, and then we will tell you from our tidal station at Grand Isle how much of that road will be underwater as a percentage of time by the year 2030 and by the year 2050. They also did 2100. But even by 2027, which is not far away, LA-1, just from high tides, will be closed six percent of the time. Now that is no hurricane shutdowns. So that is going to be closures where we are going to have 18-wheelers backed up in the city of Golden Meadow waiting to go down to Fourchon because of high tides. Okay? They

said you really need to get your road built before 2050 because by then the old highway that is at two feet above sea level is going to be closed 55 percent of the time.

So we used this data in Washington to try to educate members of the Commerce Committee, Energy Committee, all the relative House committees, to support building and completing the elevated highway. We have also benefited by the newest GPS surveying equipment that has looked at LA-1 and what they have discovered is that we have lost an entire foot in the last 20 years. So that is pretty substantial and that is probably because Bayou Lafourche, when it was an operating distributary of the Mississippi, before it was cut off from the Mississippi would have sediments deposited every year. When the river flooded, Bayou Lafourche would flood. And now that that has been cut off, we too are drawing out and just compacting and so we are sinking at that same rate of a foot

every 20 years.

And that kind of goes in line with what you all may have discussed, the Entergy $4 million study which looked at Entergy's infrastructure along the coast. And their conclusions basically said, yes, we are going to have a meter of sea level rise by 2100. We are going to see, of course, higher temperatures in the Gulf of Mexico, intense storms and everything is pretty well clarified. Now it is a matter of seeing how we are going to deal with this, how we are going to finance the hardening of our infrastructure.

We have also really benefitted from the National Hurricane Center's work with our community and the National Weather Service. And, you know, Tim asked them just to look at LA-1, look at Port Fourchon and to model out what kind of water elevations we would have for a typical tropical storm coming in now. And after they modeled thousands of

storms, they said, "What you need to know is that on average you are going to have three feet, 2.8, 2.9." And this is that levee area, so this is the area we are concerned with. But when you have 2.9 feet of water and your highway is only at 2.2, that means you had better plan early at getting people out. You know, the people that live in Grand Isle who are residents, people who are flying in from offshore who are coming to Fourchon to pick up thousands of cars, you have got to get them out early, too, before the road is simply impassable.

Kind of good news on our project is that we have half of the 19 miles of needed bridge built. We started building from the coast in Port Fourchon going north and it includes a new Leeville bridge over Bayou Lafourche. We crossed over from the east side to the west side here, but we are still challenged at trying to raise $320 million to build the last eight miles that will go north

and cross over the U.S. Corps levee up in Golden Meadow. We have had to bring in the Corps with the state and negotiate how will this roadway cross over the levee, a Corps levee that the Corps is in agreement with. And knowing if Congress ever approves our levee system, getting funding to protect us from the 100-year storm, it would have to be built up to 26 feet, like New Orleans' levees. Right now we have 50-year protection down there. So we are at a 13-foot high levee. I think 15 now. They have just raised it a little bit.

But anyway, end result, we are going to cross over that levee at 28 feet, so that if we do get congressional money to raise the levee at a future date, it won't be an issue. And we are trying to plan ahead for that.

What we have built, we are making sure that it can withstand those 100-year storm surge forces. FEMA down in this area in Leeville, this is the new Leeville Bridge

going over Bayou Lafourche right here. That is the top of the bridge. They said, look, you know, the new FEMA flood maps for your area said you would get a surge of 14 feet and the state said, well, look, we are going to make sure that the bridge minimally on most of it clears 17 feet. So the bottom of the bridge structure clears 17. Your tires actually ride at 22. And we wanted to do that to make sure that when that storm surge of 14 comes in, you generally have some wave action on top of that, that the structure wouldn't get impacted by that wave action.

And they said look, we also want to make sure that it can withstand collisions from boats that might get loose at Fourchon and float into the bridge structure. Because Federal Highways was conscious that that barge went through the levee by the Industrial Canal in New Orleans and they said, you know, with all the marine activity you have, we want to make sure that's not an issue here.

So some of these pilings go 160-180 feet down to make sure we reach the sand levels that could withstand those forces for the structure itself.

And from Leeville, we just opened last year this section for about $150 million and that goes down to Port Fourchon. Here you can see some of the fishing camps. The port is a little bit more this way. And this is the LOOP booster station. But our community is tolling itself for all of this. We knew that if we wanted to preserve the 2,000 jobs at Port Fourchon and we would be asking our state for money and the federal government for money, that we would have to chip in ourselves.

We always show everyone how the new structure performs in relation to the old structure. And this was when Ike was passing about 160 miles offshore and going for a Texas landfall. It was still pushing a lot of water inland. In fact, we had some of the highest

water for Ike than we had for any storm.

At that time, we had about 400 utility trucks repairing the Gustav damage from three weeks before. Gustav hit Fourchon head-on. And it was moving very, very fast. It didn't do a whole lot of damage. The port is pretty resilient, but a lot of the power poles were down and they were repairing that. And they actually lost one power truck that day when evacuating. There were a lot of out of town drivers and they just weren't real sure about where the road was versus the wetlands.

So we have kind of put in $370 million into the project from different sources. The biggest source has been bonds our community sold, and we took out a federal TIFIA loan, which is Transportation Infrastructure Finance and Innovation Act. And our tolls for 30 years are going to pay back the private bonds we sold, then it is going to pay back the TIFIA loan to the U.S.

Department of Transportation.

You know we wanted to use the newest kind of tolling system. And I know you all are from all over the country, so we are using open road tolling. That way, we don't have to pay attendants and have a staff of 18 people to keep up toll lines and all of that stuff. So it makes it -- by law, every penny of our tolls go to the bonds. Nothing goes to the structure. The state has agreed it is going to maintain the structure for the life as just part of its state maintenance program.

And our challenge in building the rest out, the 320 million starting up at Golden Meadow where the levee is, we are going to have to break it up because there is not even a federal program that we can apply to to get money to build this right now. All of the stimulus monies have been expended. I don't know that the U.S. Department of Transportation will have any more programs with the cutbacks coming out of Washington.

And it is kind of interesting. You know, we will meet with the Interior Department and they say well LA-1 is absolutely vital to servicing the deepwater Gulf of Mexico and we will go to Congress and say it really needs to be built but we have no money. And go to Homeland Security and Homeland will say it is absolutely vital. It is on our critical asset prioritization list but we have no money to help you. Go to the Department of Energy. And the Department of Energy says it is absolutely vital. We monitor it for every hurricane and monitor LOOP and what is going on with the flow of oil but we can't help you. Go to the Department of Transportation. And the Department of Transportation says sorry, you are not part of the interstate system. We really have no obligation.

So you know, our goal needs to be try to get these agencies, including NOAA when the Department of Transportation values future

grant programs to go and say we all have a working stake here, five federal agencies that need a functioning and secure highway for the betterment of the nation's energy security and we would recommend you fund it.

So we are going to try to get 45 million. We are going to build our first leg and that would allow us to back up 18-wheelers and deliver piling for cranes that are going to be mounted on temporary pilings. In our environmental impact study we agreed with all the environmental agencies to build this in the most environmentally friendly manner with end-on construction. In fact, I have a photo of how that is built. That is how we built the southern leg of it. So basically they come in with temporary pilings. They put tracks on it similar to a train track and then cranes continue building down and other cranes build the highway under the actual cranes. And all of that comes up when you are done and you are left with a structure. The benefit is

you don't have to dig a construction canal for miles that would bring in more salt water intrusion into our coast. I mean, we don't want that. So we are happy to build it this way, it is just very expensive. It is $40 million per mile and we have eight miles left to build.

And as a coalition, I kind of look at all the funding opportunities that we possibly can. We are, of course, asking our own state to make this investment. We are even getting the oil companies to contribute. We actually had a six million dollar match on the last federal grant application because the U.S. Department of Transportation said you know the oil companies are making a killing. They ought to help with this road that is eventually going to help them. So the six million dollar match didn't win us any TIGER funds.

We are looking, though, at RESTORE Act monies. And as you know, the RESTORE Act

allows for some investment of infrastructure, if it has been agreed upon by that particular state. We are looking at U.S. Department of Transportation projects of national and regional significant future grant rounds but those will probably only be 500 million for the nation. Well that is ten million per state. That is nothing. We would need three-fifths of the nation's entire allotment just to finish this.

We are looking at future OCS royalty-sharing funds because in 2006 there was federal legislation that says that the federal government will share some of the royalty funds with the Gulf Coast states and we are looking at any future energy and job tack bills, too. I mean, there has been some talk about maybe opening up other areas of the OCS, since we can drill safely. And having those monies maybe go to an infrastructure fund that all 50 states can apply to. So that could win some support, I think, throughout

Congress.

And you know, we try to keep all key people just informed on the vulnerability of LA-1. Lisa Murkowski has been down there quite a bit. She and Senator Landrieu have similar issues, being coastal states, they both have oil production off of them. And she was at a discussion earlier this year talking about climate change. So I am encouraged when even Republicans are talking about climate change. And she has been to Fourchon several times. She knows it needs to be looked at and we appreciate her speaking up for it.

We also know it is all about planning for the future. Planning infrastructure that can withstand climate change, future storm surges. And Nancy Sutley with Federal Adaptation Strategy has talked about that, about making sure that knowing things are going to look very different, we have to plan for that.

Now we realize between our levee

system in Golden Meadow and the 19 miles going down the Fourchon that Port Fourchon may be Fourchon Island in the future because our wetlands in-between are disappearing. So again, we have to plan for a very strong elevated highway that can service this nation for years to come.

And I just wanted to close out. I mentioned to Margaret on the break the conference said they wanted us to identify if there were any outstanding issues with our communities that NOAA can maybe help on. And as we are southwest of the city, Bayou Lafourche is in-between two of the nation's most quickly disappearing basins, the Barataria Basin and the Atchafalaya Basin. And our most efficient tools we think to restore those wetlands will be fresh water diversions. Because fresh water builds these lakes that have died from salt water intrusion and gets them flourishing again. Flotons material grows in them. It becomes decayed

matter in winter and it starts a process of bringing that back to life.

We have been trying to get Davis Pond operated at a greater level than 30 percent of its capacity for years. And we have struggled with that. But now the Corps back in 2007 in the WRDA bill we were able to get them money funded to look at changing how it is operated. And the issues that has come up at the public hearings quite often is that National Marine Fisheries says well you know if we put too much fresh water, then it is going to change the fisheries, the salt water fisheries, in particular, the oysters that have come further up in the basin than they were 75 years ago. Well they have only come further up because our marshes are dying. It is converted to open water and we are getting salt water.

So I think we just need help from NOAA leadership looking at how strong does National Marine Fisheries' comments matter.

If you are talking about well we are just going to keep it the same and let everything die off or are we going to rebuild those wetlands with fresh water? We have to decide if we value the fisheries over the sustainability of communities that need the wetlands rebuilt.

And you know, those fisheries are going to change. Davis Pond has made some changes in the Barataria Basin. Right at the beginning of it, it has turned to a great fresh water fishing area. People are catching incredible bass, crabs, you name it. So certainly we have to trade off some things.

But we would just ask NOAA to look at that very hard as we move forward with Louisiana's coastal plan and whatnot. This just kind of shows how the fresh water diversion comes in and they know that salt water lines were going to be pushed further south of 15 parts per thousand when the structure was opening but it is only run at 30

percent. So we have to move beyond just saying we are just going to keep it the same because of some of the fisheries issues. As a society we need to say we need to value the culture and the communities' long-term sustainability maybe over some select fishermen. And look you know, we could relocate those oyster leases further south right on the coast down by Grand Isle where they were 75 years ago. You never had oysters that far in.

So to me, it is common sense but I know it is tough to move things. We are having the same type of issue with National Marine Fisheries on the west side of Bayou Lafourche and I have a picture of that project, I think. Well, I don't.

But anyway, it is just something we would like you all to consider. And I am happy to answer any questions but I want to thank NOAA for partnering with our community. We are very rural. We are not incorporated.

We would never have been able to get the resources to do the inundation study that CO-OPS did, that CO-OPS partnered with Homeland Security to do on LA-1.

And I also, on behalf of Fort Fourchon, the Executive Director wants me to thank NOAA for their post-storm activities of coming in and surveying the channels so that commerce could get back up and running. I mean, they were down there I think a day after Isaac. Tim drove the road and couldn't see where the road was but he knows it by heart. Thank you all for all you do for our community.

(Applause.)

CHAIR WELLSLAGER: And finally, Dr. Mitchell.

DR. MITCHELL: My name is Jim Mitchell. I am the IT GIS Manager at the Louisiana Department of Transportation and Development. Oh, you've got my first slide up already. I was going to go to my title

screen. Oh well, we will forget that part.

Anyways, our Department is responsible, according to Louisiana Revised Statute 48:36 for the Louisiana Topographic Mapping Program as well as the Geodatabase of Louisiana and Geographic Names Authority. So my approach here, my discussion today is going to be primarily about how I use GIS data. And Tim gave me the title, so I had to figure out some lessons learned.

I have been working -- well, let's go back to the background a little bit more. My Ph.D. is from Duke University in hydrologic modeling. I went from there to the Kansas Geological Survey in Lawrence, Kansas at the University. I did a lot of groundwater modeling and hydrologic modeling there. From there I went to the Department of Natural Resources in Louisiana, where I worked in the GIS Lab. And then after that I was at the Department of -- well it was the Institute for Environmental Studies at LSU in the

Environmental Planning and Management Program as a professor. Most of this work that I have done in the past has really been hydrology. So a lot of this stuff is kind of second nature to me, although my primary responsibilities now are geographic information systems and the use of geographic information systems we are going to talk about today relate to emergency operations and response kind of stuff with the Department.

My background in that regard goes back to I guess 2002 was my first hurricane season in the Department. Hurricane Isidore, Hurricane Lili, that is what I cut my teeth on. Every year we had hurricane drills and destroyed New Orleans. So when it came time for Katrina, we executed the largest evacuation of a major metropolitan area in history with our contra flow operation, moving almost four million people out of New Orleans before the storm. So we are going to talk a little bit about roads and elevations and some

of those experiences.

All right, so where is zero and where did it come from is really the essence of the problem here when we are talking about roads and elevations and how we assess risk and make decisions for emergency operations.

Oh yes, another thing by the way, it was my team that worked on all of the maps and the development of the emergency evacuation plan for Louisiana. So the various phases for moving people, there is a half a million people -- well, when we did the plan it was maybe a little bit more. Excuse me, 50,000 people south of the Intracoastal Waterway living in -- 50,000 households, excuse me. There is a million between the Intracoastal Waterway and I-10 and there is another million in the Lake Pontchartrain Basin itself. So we used a lot of geographic information, systems information to do those analyses and put together that evacuation plan. Again, we were really very successful.

But the issue with zero has always intrigued me. There is all kinds of zeros floating around in datasets. I am using data. So you know in an emergency, you don't have a whole lot of time to read through all the information about the data. I am trying to get data where I can find it. Hopefully, it is good data. We have to do some kind assessment on the quality of the data. But I have got datums. We have talked about NGVD29, NAVD88. We have got ellipsoids and geoids and spheroids and all that kind of stuff. And we have got a whole bunch of engineers and surveyors that grow up and learned about benchmarks and all they think about are benchmarks.

So how do we reconcile all that stuff when I am looking at data and I have decision-makers that are asking me about when a road is going to flood or some other operationally-significant situation.

Until we understand that, we are

in the dark. We really don't know whether a road is going to flood. I get questions like find out for me how much of the road is going to be three-inches deep, six-inches deep, nine-inches deep, three-inch increments up to two feet and then every foot after that. And if we don't know where zero is, we really can't answer those kinds of questions.

So the issue of getting road elevations is -- did we get to the right place here. I'm sorry. I'm switching all over the place on this thing. All right.

So road elevations and topics related to that are really important issues for us because we talked about it in some of the earlier presentations. We need to make a decision on when this road can be opened for an evacuation, when do we shut it down for an evacuation. We have thousands of people down on Grand Isle for the Tarpon Rodeo and we got a tropical storm somewhere in the Gulf, maybe headed this way, maybe not. How do we make

those kind of decisions? When do we alert the local officials? When do we work with the state police? Of course when we have got the big storms and stuff, we have got the whole issues of contra flow.

This is the LA-1 corridor we talked about. So we have surveyed information along the highway that we have collected. We know the road elevations on a series of points that are maybe ten, fifteen, twenty feet apart. If we know the elevation of the water that is expected to be on that piece of highway, we can make a decision. And it is not, again, just the elevation but when that elevation is going to be reached.

So this is the bridge is down here. We run across it to Grand Isle over here. And all these people that are on this island are going to have to go out through here. All the Port Fourchon folks, which have a little bit higher elevation here, are going to have to get across. And everybody goes up

through Golden Meadow and hopefully gets to high ground in time not to have to deal with cars being inundated or loss of life or other issues that are really very important.

And we are in the process of doing these things, working with the guys at NOAA, on the phone with Tim getting emails and messages from Tim. I have spent a number of long nights talking with people like Will Schaffer and Stephen Baig who are now retired. But I worked with storm surge modeling and storm tracks and that kind of stuff, trying to figure out where we make our next move. We are doing all that stuff well ahead of the storm and we are working with forecasts.

Well, we will get to the next slide here, I think. All right. So, how do we determine whether a road is going to be flooded? What is the risk on this road? We got the road elevations. We have tide gauges and we have stream gauges in some of the different water bodies. Remember, think about

that map. You have got these stretches of elevated areas going down through the marsh. Surrounding them are bodies of water. So there are a number of devices that monitor these things out there. USGS stream gauges, NOAA tide gauges, Corps type things.

We also have as a storm starts to focus on what it is going to be, we have the MOMs, the mother of all MEOWs. That is sort of the worst-case scenarios you might get. So we know what we think the storm speed might be, fast or slow. We may have an idea of what the timing is. So whether it is a high tide or low tide kind of thing, we have an idea of the category of the storm they expect when it is coming and we can start planning on what kind of inundation we might experience.

The MEOWs, the maximum extent of water, those are, again, pre-calculated data. Those are a little bit more focused on a particular type of storm and storm condition. So as we get a little bit more idea as we are

coming in, we are not getting real-time forecasts of what is going to happen but we have an idea of what kind of storm we are going to get so we can get an idea of what kind of flooding we are going to get from these.

And by the way, as I went back and looked at some of these things for the Isaac storm, the big category one storm that nobody thought was going to flood a whole heck of a lot, and in fact the MOMs showed that a lot of the areas that got flooded that nobody thought it would ever flood in a category one storm, were floodable areas. So these are very useful tools that we have before we have any real information about a storm.

And of course, then when we get the operational forecasts that come in as the storm is actually reaching the window of time when we are working on this stuff and then we have got wave action. So how high is that storm? Army talked about it. We have got a

tide sitting on top of that. We have got a storm surge sitting on top of that. We have got some wave action. And that is going to give us an idea of what is happening in terms of the risk to the road.

But all these things to make this work have to be in the same reference frame. And the problems that we run into all the time in trying to use data in real time, making real-time decisions during an emergency operation is that tide gauges and stream gauges might be sitting in NGVD29.

Some of the MOMs and MEOWs, I think they are moving. Everything now will be NAVD88 by next hurricane season. I think we had one left in 29 this year. So we have got issues of things aren't quite matched up in terms of datums.

During Isaac we had an issue where the Pearl River was crossing I-10. The Pearl River is the border between Mississippi and Louisiana. There were some issues north of

that, where there was a potential lock and dam breach. We had water approaching the I-10 abutments. They wanted to build a berm high enough to make sure that we had enough protection on that so that I-10 would not get flooded by the Pearl River and they are asking me for elevations. You know, I get a call on a Saturday night, "Hey, how high is that road?"

So we have some of that survey data and we go out and get that and we find out that the survey data is an ellipsoid height, so they are minus 20. I know that road ain't minus 20. That road has got to be at least above sea level because it is not flooded all the time. So we had to go in and do some manipulations and calculations and try to address that.

The gauge that they were looking at upstream from the USGS was in NGVD29 and we actually found some sort of a CO-OPS gauge that NOAA and the local parish had actually on

the bridge structure that we were concerned about and started talking to the engineers from the parish and I am getting elevations from that in real-time over the internet. Really cool stuff -- important stuff. But the numbers were just a little off in terms of the numbers that I expected to have in that area. And when I asked the people from Saint Tammany Parish well what is the datum, all they could tell me is well, it is geoid `09. Well, that is actually really not a datum and all of my stuff is in NAVD88.

So one of the things here is that all of our elevations -- I think we get lesson number one here. Where are we? Lesson number one is it is all about elevation. Okay? I borrowed that phrase from the presidential campaign of 20 years ago. It is elevation. I need to know an elevation. I need everything in elevations. I need them in the same datums. I don't need to spend a lot of time trying to figure these things out when I

get a call on Saturday evening and the guy is saying I need to build a berm in the next hour or two before the river rises high enough to flood the interstate. I need to know this stuff now. So I need to get elevation information for storm surges. I need to get elevation information from real-time sensors. I need to get elevation information from all the federal agencies and state agencies that are collecting data all in the same datum, so I don't have to play this mix and match game that goes on.

Information on flood depth is useless to me. We ran into this during the Atchafalaya flood in 2011. The Corps of Engineers provided everybody with a nice GIS data set of flood depth. I can't take flood depth and compare it against my road elevations and find out what the actual depth is going to be on that road because the flood depth sits on top of my road. It has no datum. So the information that comes out to

me, operationally, I need to have elevation data. The flood depth and above-ground level type information is useless to me.

It might be useful to tell the public that well, this area is going to be five feet deep in water. Well if that guy is sitting on a ten-foot high local high, he is going to be out of the water. If he is in a local low spot, he is going to be ten-feet deep. So above-ground is not a very useful thing for operational purposes at all and I really think it is marginally useful for the general public. And then of course the whole issue of processing the data. The data needs to be ready to use. It needs to be actionable data.

So I want to talk now about some of the geospatial data that we have to deal with because it is not just the forecast coming in but I have got to have something to throw the forecast on top of in my GIS to do the analysis. And this is an example of some

of the discrepancies in the data that exists. This is southwest of the mouth of Mississippi River, Shell Island. Some of you may recognize that location. The stuff in blue here is water. Right, blue is always water on a map so that is easy.

The stuff in orange are what the NOAA T-sheets show as land. It is really now water. So the NOAA T-sheets are showing us land here that really doesn't exist.

And you see some of the red stuff up in here, that is the National Hydrography dataset, which is the official hydrography data that is collected and maintained by the U.S. Geological Survey. Actually we are the ones, the state are the ones that are collecting and updating that and the database is maintained by the U.S. Geological Survey. That is the red stuff up there.

So there is a major discrepancy in the data that we see on our maps and what is really out there on the ground.

Here is another example of the same thing. The yellow polygons that you see here would be mapped as land in I think that is the USGS -- there is a line graph, a 100,000k product. The imagery behind it is probably about ten years old now and you can see those features just really don't match now. It is probably worse. But those are the kind of data that get put into our geographic information systems and that analysts are using to try to analyze whether coastal restoration projects are working or what needs to happen in a particular area in terms of restoration, what is going on in terms of flooding, what is going on in terms of planning, channels, all kinds of things.

All that stuff, if it is built on old data -- the average map in Louisiana -- the average quad map in Louisiana is something like 22 or 23 years old and they are just getting older because the USGS isn't replacing them but people continue to use those.

All right, so the key here is that I am going to use this information to do a geospatial analysis and it is just not good enough to support the kind of applications that I have to answer some decision-maker's question.

All right so, lesson number two. Maps and pictures, imagery are static things. The world changes. As soon as you take that picture or as soon as you make that map, something happens. Highways are terrible. Roads are terrible. People are building roads all the time. People are changing roads all the time. But the natural environment is dynamic also. So we get a storm that comes through. We have so many features. I have been working with Tim and Meredith Washington at NOAA on trying to look at features on navigation charts that are no longer there. Things have changed in the coastline but they haven't changed on the maps. So if we are using old maps, we are not seeing what is out

there. So we are going to execute search and rescue activities. We are going to execute recovery activities. I got a question, when the Deepwater Horizon came out, from our operations folks. Well, how many miles of coastline do we have? You know, we need to calculate something about how much damage or whatever. I had numbers that ranged from 396 miles, that was the one I think the governor was using, to 23,000 miles, depending on how you defined what the coastline was. And that just changes all the time.

So GIS data is a little better, if it is kept up-to-date. But a lot of that GIS data came off of a lot of the old maps. That is just an issue that we have to deal with. You get a lot of aerial photography and imagery during storm events and emergencies. But you know what? It is just a picture. All I can do with my GIS in that picture is tell you how much red, green, and blue there is on any dot. I can't tell you that that dot is a

road, a high spot, a low spot, a tree, water, anything else, until some kind of analysis is done. And there is an awful lot of analysis to be done to turn picture information, imagery information into actual data.

The next lesson: practice makes perfect. So we do drills. Again, we did drills. We destroyed New Orleans for four years in a row before Katrina ever hit and that helped us develop all of our data flow skills. I put together websites. We had the whole storm approaching. We had the tracks. We had the wind rings. We had all of that information so it was just like a real-live storm event.

And I should give NOAA some kudos. During hurricane season starting, actually it was a little bit earlier this year, but the first of June all the way through the end of this week, every morning I checked the tropical weather outlook. I look at what is happening. If there are things that are going

on with something that is going to affect Louisiana or the Gulf, I will send a message out to, I don't know, about 300 people are on my list now to tell them hey, just be aware that there is stuff going on. If an event actually happens, if a storm comes up, a tropical depression, I am looking at HURREVAC. I'm pulling in the HURREVAC information and I am following the storm tracks. I am providing that information as graphical links to people that include folks all over state government, the private sector, people even outside of Louisiana that are interested in this stuff. And all of that situational awareness stuff contributes to responding and being aware that stuff is going on.

The drills are really important, again, for developing all of those workflows and understanding what works and what doesn't. You need to involve everybody in these drills so that you have the whole process worked out. The decision-makers need to know where their

data is going to come from. The people that are handling the data need to know where the data is going to go. They need to find the data. They need to be able to work on these things together.

And another really important part of it, when we used to do our drills -- we actually haven't done a drill, by the way, since Katrina. But all of our drills before Katrina we had the Coast Guard in there, the state police, GOHSEP, all the people that had a role to play were all invited to participate in this thing, Port Fourchon including, by the way. And we would do this thing all over the web. So it would be like a live fire kind of situation and we would script the whole thing out. And we brought Jay Grimes in, the local weather guy, right? And he was our master of ceremonies. He was sort of here is the next step in this process and we sort of take a whole day and run through the thing.

So it is really important to

involve all the different agencies that are doing work that contribute to your emergency response so that you can work out all those little things about how you trade data back and forth. We have so many better ways to do this today than we did ten years ago when I first started this stuff.

We are talking about emergencies. Really, they are fascinating things. I was never involved in this stuff as a missionless academic when I was at LSU. You know, we just got to watch it and talk about how we could make it better or how we could get a grant to fix something. But in an emergency operation, you have all this stuff that has to go on. You find these gaps in data. We need this stuff. We need that stuff. We don't have it. How do we get it? You know, it could be anything from road elevations to where do I find sand and gravel pits because I am going to have to start mixing cement to fix things.

On the other side, you get just a

load of information that you can't even handle. There is so much imagery coming down. There are so many -- Katrina -- we finally called the place that we were putting all the Katrina data just the trash heap because it was just a place on the internet that was just full of stuff so you couldn't find anything. So there is a whole bunch of issues on both ends of that continuum. It is fascinating actually.

But there is a huge gap between the data sources that you have and the decision-makers that you need to get something done to solve a problem that they are addressing at some high level, whether it is do we call contra flow? Do we evacuate this place? Do we close this road? Do we close this bridge? All those kind of things.

The decision-makers, they want answers. They don't want to analyze data. That is just a real key. So again, the drills help some of this stuff to work out some of

those questions.

What's so funny? I am interested in your opinion of the accuracy.

MR. ESTOPINAL: My favorite quote is Will Rogers, the great philosopher, who said that the trouble ain't the things that we don't know, it is the things that we do know that just ain't so.

DR. MITCHELL: That's real good because GIS rule number one, I taught my students this when I was a professor, day one: everything you know is wrong. Because you know, you take this data. You think it is correct. You think the elevation is one thing. It is something else. You think it is accurate. Well, it was collected ten years ago, so it is a foot off. Whatever.

So you need to be aware that there is inaccuracies, whether it is inherent inaccuracy or just inherent variability in the data that you are using to feed to the decision-makers. So just be aware of that.

You can't just give a number sometimes. You have got to say well, the guy that asked me for three-inch increments of flood depth on a road, come on, give me a break. I can't give you that. We were talking earlier, you can get four inches of accuracy on a GPS. So you have got the accuracy of the road. You have got the accuracy of the forecast. It is just crazy to try to expect that kind of precision.

GIS rule number two, just there is a thousand ways to process data in a GIS. You don't know how this data has been handled. You don't know whether they used the right transformation to go from one datum to another. It is like chain of possession. All of this kind of stuff is important to just be aware of and just understand what is going on with the data so that you can make a determination whether this really solves the problem or not. You are being asked by the decision-makers, who don't understand any of this stuff.

And then number three, I kind of stole that from someplace else but the bottom line is there is just data everywhere. But it isn't necessarily the data that you want to have. It is in the wrong format. It doesn't have enough spatial accuracy. It is ten years old or 15 years old, whatever. All that kind of stuff happens all the time. Data is just messy stuff.

So I come now from years of experience with what I call my 5A data standard. Okay? And this is what we need to be thinking about as we are producing data and also as we are consuming data. The data needs to be accurate. It needs to be accurate in space. It needs to be accurate in time. It needs to be accurate in terms of the measurements. Is one foot enough for what you are doing or do you need six inches or three inches or whatever? All of those kind of things figure into the concept of accuracy.

You know I mean one of the most

important ones is is this thing coming from somebody that knows what they are talking about. Is it authoritative? I have no problem with getting stuff from NOAA and feeling that it is authoritative. I have trouble when the guys at LSU do a storm surge forecast and they send the people that I have to support some storm surge forecast information and I don't have any idea how they put it together, what their basic assumptions are, what their underlying data are, anything else. Okay, so I want to have an authoritative source for the data that my people are using. If nothing else, I can always blame it on NOAA, right?

It has to be actionable. Okay? I don't need to be doing a whole bunch of data manipulations. I don't have to be changing units and I don't have to be projecting and re-projecting and messing with the data all the time just to be able to use this data to answer a question from a decision-maker that

wants a decision an hour ago. So it has to be actionable data. It has to be accessible. It has to be discoverable. You have to be able to find this stuff.

So when you are putting together, when you are doing your drills, that kind of stuff, you need to make sure that you sort of looked at everything, have everything at hand that you can use that you think you might use. And if you don't have it at hand, you need to be able to know where to get it from.

And then the simplest way to deal with affordable is it's all free. And I have no problem with NOAA on that one either. I have no opportunity in the middle of an emergency to go through the state purchasing process to buy data. It just ain't there.

So that is my 5A data standard and I think it is just really important to be thinking about those kind of things.

I think that having an idea of how good your data are is so, so important. We

are often confronted with the idea that well, hey, we got the data; it is good, let's use it. And that gets us into more trouble than it is worth. So the idea that the best available data is doing to solve my problem, sometimes you have to go to the decision-makers and say you know, we really don't have any data that will do that. And when I hammered away at the Atchafalaya flood data and realized after a while that there is no way I am going to get flood elevations on the roads from this stuff, I had to tell the guy, our Assistant Secretary, it is just not there. And sometimes that just has to happen. We have to all be responsible for making sure that that information is -- the reliability and usability of that information is all accounted for. Thank you.

(Applause.)

CHAIR WELLSLAGER: Thank you very much. Elevation is everything. You are right. Louisiana is flat. I can see how

issues, especially with the geoid model when it is applied to the ellipsoid can cause problems when one geoid model might not work with the other and you have got variations in elevations.

I guess my first question is to Cliff and that is, with all the gravity data that you are capturing, is there any processing of that? And how is it actually placed into a data set that is useable? And then is it sent to NGS so that they will be able to refine that and add that to your area here in Louisiana so the geoid model can be refined?

MR. MUGNIER: We're not currently capturing any gravity data. The last time we were was when I was with the University of New Orleans and this was back in the middle '80s, --

CHAIR WELLSLAGER: Okay.

MR. MUGNIER: -- and all of the data then was done to NGS second-order

standards. It was blue-booked and it was submitted to NGS and it was adjusted then in their database. But that was essentially relative gravity at benchmarks in metropolitan New Orleans.

Juliana has a point.

CHAIR WELLSLAGER: Juliana.

MS. BLACKWELL: Just related to the gravity, I am sure you have heard of the GRAV-D mission, Gravity for the Redefinition of the American Vertical Datum. And just so the panel knows and the other stakeholders here, NGS does recognize that there are problems not only in Louisiana but in a variety of areas across the country with NAVD88. That is the current vertical datum for the United States. And in some areas, particularly in Alaska, it is off by up to two meters.

So approximately four years ago, NGS began with a pilot project to collect airborne gravity to use that as the basis for

a new vertical datum and that project is called GRAV-D and that is to help better define zero uniformly across the country, as well as our territories, and be able to use that to establish the vertical datum of the future. We expect that that will be completed in the year 2022 with the current funding that we have available to us for this project.

Now I don't know if you are aware or not that there are areas that have been flown with this GRAV-D mission and coastal Louisiana is one of those areas. Because this is an effort across the country, it is not something that is going to be released as a final product until the vertical datum is complete. But there are data sets available now that meet, I think, your 5A criteria that are available on our internet website that are free, that can be looked at. But again, this is airborne gravity. What we are going to do next is make some beta geoid models for users to be able to then take and apply and see how

they fit with the current situation in their area.

So it is going to be an iterative process and it is something that we are currently, I believe we have got about 24 percent of the country that has the airborne gravity already collected because we recognize that doing it the old way of leveling benchmarks isn't going to cut it. We can't afford it. We don't have time for it. Airborne gravity is a better way to accomplish a more seamless way of collecting information for gravity to create a better vertical datum.

Now that said, you are also going to need terrestrial ground-truthing of that data. So there are datasets that are being collected now and will be collected in the future on the ground to make sure that the gravity that we are collecting from an airborne platform does sync up with the measurements that you would collect if you were on the ground doing it.

So I think there are great opportunities to do things like the spacing that you were talking about here with A-10s and different types of gravity collection to make sure that Louisiana is well-covered with terrestrial as well as airborne gravity.

So that is a lot of technical stuff but please take away from that that we are trying to make much a better vertical datum not only here, but everywhere, and we do think that this going to -- it is accomplishable to get to a two-centimeter improvement, two-centimeter accuracy for the vertical in the coastal areas. So that is probably realistically what we can do with the technology that we have today and hope that we can continue to refine that perhaps even before we are completed with the next vertical datum. But at this point in time, we think a two-centimeter accuracy is very achievable and that will be certainly much better than what NAVD88 has given us for the last several

years.

So I would like you to keep that in mind when you talk about doing the gravity collection and how -- that we are making an effort and we do think that this is a more efficient way to improve the vertical for coastal areas. Thank you.

MR. MUGNIER: The problem is is that is ten years' away and we have got people who need flood elevations today.

I understand that there are some open dates for the gravity program that possibly could be moved to Louisiana, if the priorities were set.

MS. BLACKWELL: Again this is Juliana.

Granted what I said is it is ten years' out with the current funding. It could be longer if the funding is no longer there. So again, there is always caveats to it. If there were more funding we could get it done probably sooner.

And so we are looking for opportunities for partnerships. We are looking for opportunities to release interim products that will help people in a nearer term than ten years from now. But we are not going to release something for people to test until we are confident of the accuracy of what we are accomplishing with the mission itself.

So the data sets are out there. If there are folks in universities or other places that want to take a look at airborne gravity and do some work with that, we can certainly have those conversations with our experts at NGS and be able to share that. The data is available to be able to discuss the data and have people look at it and see what they can do with it now, rather than waiting years down the road.

In the meantime, there are again geoid models that are out there that we feel are improvements to what has been done in the past. Because the data has been used in

previous models, the marks have moved, the efforts are to make geoid models better and better. Now they may not match up with what you had before but you can certainly go back and use the older geoid models but you really need to use more data, rather than less, and newer data rather than older data to confirm the elevations.

So we can continue to work with trying to find the best solution for the coast here and in other places where subsidence is an issue but it is not an easy answer. But we will continue to work with you the best we can.

CHAIR WELLSLAGER: Juliana, I have I guess a question. Matt Wellslager.

For partnerships, are there any types of MOAs or MOUs written up where things might be able to be done with NGS through, say LSU, or someone within Louisiana to help accelerate this?

MS. BLACKWELL: Currently, we have

some MOAs, MOUs, kind of interchangeable, with other federal agencies where we are working with different platforms from different federal agencies in partnership with NGA, Bureau of Land Management. It just depends on the area and the opportunities that others are using airborne platforms for collection of other types of datasets. So USGS, BLM, NGA, NRL, these are all other feds that we have been working with.

We can certainly look into opportunities for other state-federal partnerships as well, whether it is sharing of an airplane that has the proper requirements to collect airborne gravity from or other sorts of funding opportunities. So we are open to all those discussions and we have had success in doing it. But again, a lot of it is very location-specific. So we don't have the blanket partnership to do things across the nation with another entity but we will still keep trying to work with FEMA and other

federal groups to see if there are opportunities for a broader partnership for the country.

CHAIR WELLSLAGER: Anybody else have any other questions for our panel?

Well again, thank you very much. I appreciate your time spent here. If you are free tomorrow, you have an open invitation to come and we can actually address some of this a bit further with the breakout sessions that will be held tomorrow morning from about 9:15 to 11:00. And these will be used, once again, to help create some of the recommendations that we will be giving to NOAA administration. And something like this could be a very beneficial topic of conversation if we were able to pursue things tomorrow.

And with that, Kathy do you have anything?

MS. WATSON: No, take a break.

CHAIR WELLSLAGER: No. We are due for a 30-minute break. So I think it is time

to get up and stretch our legs a little bit and get something. Let's meet back here at four o'clock.

(Whereupon, the foregoing proceeding went off the record at 3:34 p.m. and went back on the record at 4:15 p.m.)

CHAIR WELLSLAGER: Okay, it is 4:15, a little bit later than when I said we would get started back up but time for some panel discussions and deliberations.

We have had some interesting talks today. We have discovered that elevations are critical, geospatial information is vital. We have problems with dredging and narrow channels. I have learned that we more than likely will have individuals joining us when we have our meeting up in Silver Spring from our first stakeholder panels and possibly one or two from our second, as well, to help address things with the other invited members of the meeting that we have when we have our

spring meeting up in Silver Spring location.

Are there any points or thoughts or information that anybody here would like to address at this point in time that they have heard today or they think needs to be addressed?

Don't everybody speak up at once! Okay, Bill, thank you.

MEMBER HANSON: Matt, just real quick as an add-on to Silver Spring and having folks come. We can get similar-level folks from other parts of the country to support and echo what you have heard here. Part of the RAMP Coalition for the Harbor Maintenance Trust Fund has been the very same people that have noted to me that I was on the NOAA panel and gave me a laundry list of things they would like to see NOAA do. So it is much the same group of folks. And so I think there is a lot of sharing we can do with that.

CHAIR WELLSLAGER: That is good to know.

Scott and I were talking earlier and this has been the first panel meeting that I have seen where we have gotten the wealth of information that we have had. This has really been kind of an eye-opening situation. And we have gotten a groundswell going.

I think it has been great having both Kennedy and Margaret here. And they have made statements and they seem to be very happy and excited about some of the things that we have addressed and topics that we seem to want to push forward with.

So following up with something exactly what you are talking about, I think will only help foster that growth and we will definitely follow-up with that. I heartily recommend doing that.

Frank.

MEMBER KUDRNA: I was going to follow-up on the discussion of Juliana's technology that she was describing. And I know resources are needed to do everything but

this seems like a really pressing area that could have enormous benefits from the information you are talking about. And maybe NOAA could consider making this a prioritized test project to demonstrate how effective that technology is and to get some of that information into place. Because these folks are going to have another one, one of these days, and it would be enormously effective, and maybe to help partner them with FEMA that should be really interested in this.

MS. BLACKWELL: Frank, I just want to let you know that, like I said to the stakeholder panel, there has been data collected in this area. It hasn't been turned into another model yet but it is something that we plan to do. The data was collected a few years ago. With Alaska being a priority, we have been collecting in Alaska as well and have over half of the state there collected.

And so our goal is to have interim products that people can utilize for the near-

term and not have to wait ten years to do things. But we need to ground-truth it but we are not going to have the full thing collected.

So even if we finish collecting the Gulf of Mexico, we are not going to be able to deliver a new vertical datum until we have everything flown for the United States. We can't do it piecemeal. It has to be done as one new datum.

But we will have interim products available for the stakeholders here and others to be able to apply to their data, you know, beta models that they can apply to their data to see how it fits and to make determinations based of that more recent airborne GRAV-D.

So on our website -- and I talked to the gentlemen after the fact and asked them if they were aware of it and they said well yes, but I am not quite sure that they understood that we are working on making these things available to them sooner rather than

later. It is just not going to be a complete product for several years to come.

We do realize it is a high-priority area, like I said, just like Alaska is, too. So we are trying to get those areas first so we at least have something initial to utilize and to share with our constituents sooner rather than later. And then leave the central part of the United States as the last area because that seems to be the less critical. We want to get the coastline done first.

MEMBER KUDRNA: Well maybe a meeting where you would explain the potential uses to them or help Louisiana understand how they could take the products you currently have available and use those I think might be effective. Because as we said earlier, we can't just go down the list and ask for more money for everything around in this budget environment that we have.

CHAIR WELLSLAGER: Scott, did you

want to say something?

VICE CHAIR PERKINS: Juliana, this is Scott Perkins. Is it a lack of money or is it a lack of platforms and gravity sensors? What would be -- to get the project done in advance of 2020, what would it really take to accelerate the schedule?

MS. BLACKWELL: It all comes down to money. Because if you want to have more platforms and you want to have more sensors, you need to pay for those things.

So currently, we have two airborne gravity meters. We are working with a number of platforms, federal platforms, as well as there is NOAA assets and there is some other federal agency platforms that we are using through our MOA, MOU. We are also contracting out to do data collection. This year we are looking at doing not only data collection through third-party surveyors, but also data processing. So that is going to be the next step.

But the limiting -- the limits are based on how much funds we have available to put towards this effort.

CHAIR WELLSLAGER: I have got a question, Juliana. I'm sorry. Go ahead.

MEMBER DEMPSEY: Juliana, why can't an area be released without the whole country being released?

MS. BLACKWELL: An area can -- datasets have already been released. But the data then has to be turned into what they were talking about, these geoid models. Those can be done. They haven't been done yet because we have been focused on processing the data that we have already collected.

Now that we have caught up with a lot of that data processing, that will then get handed over to the geoid team that will start creating beta geoid models for the area. So that can be done. And I expect that in FY13 we will start to see those regional geoid products available. But that, again, is going

to be a model.

What we are talking about completing in 2022 time frame is a whole new vertical datum. It will no longer be NAVD88 as the vertical datum. It will be a new named vertical datum that will encompass all of this airborne gravity that has been collected, so that it is all seamlessly tied together and not disparate datasets and disparate models but everything that gets put together into a truly national vertical datum.

But between now and 2022, there will be, again, these regional beta models available for people to utilize to help them in their everyday needs.

So again, 2013 will be the first year that we will start to produce those beta models for the Gulf.

Again, this was one of the areas, one of the earliest areas that were collected. But because we had a backlog and we are trying to meet data collection, we focused on data

collection before we were able to finish processing the data that was collected originally. So we are playing catch-up. And now that we have a different process and different platforms going, I think we are in that next stage to create those beta models this coming year.

CHAIR WELLSLAGER: Jeff, go ahead.

MEMBER CAROTHERS: This is Jeff Carothers.

I am just curious how CO-OPS and Gary, you guys handle it. I mean you got tide gauges in these subsidence areas. I wonder how you adjust those. They have got to be just somehow for subsidence.

MR. EDWING: Yes, Rich Edwing with CO-OPS.

So just as some general background, we do have to adjust tidal datums once every 25 years or so for general sea level rise. You know, we make adjustments and it is based upon a 19-year tidal epic which

aligns with that Metonic cycle you heard about earlier. However, there are some areas and not just in Louisiana where either because land is either subsiding quickly or rising quickly up in Alaska, we have actually gone to some five-year datum updates. Because when we do the 20-year update, we kind of pick a point in the center to set the datums at, mean sea level. But things are changing so quickly in some of these areas, that kind of becomes irrelevant pretty quickly.

So there are some special areas where we have, we kind of publish a special five-year tidal datum update every five years.

MEMBER JEFFRESS: I would just add to that, if you look at let's say Galveston where we have a subsidence sea level rise net of 6.6 millimeters a year, that is a very linear trend over the last hundred years. And so if you take a 19-year record with that slope, the average which is going to compute mean sea level is going to lie between the two

extremes, so the beginning of the 19-year and the end of the 19-year. So the average is actually going to be than what the actual sea level is and hence, the five-year update.

But even if you use the five-year update, that sea level trend is going on, your mean sea level is still going to be not like it is at present because it is going to an average of five years, so it is at least two and a half years' old.

CHAIR WELLSLAGER: Juliana, I've got a question for you.

Is the entire state of Louisiana encountering the problems of subsidence or is it in the lower sections of this area? And the reason why I am asking, South Carolina is one of the last of a dying breed, I realize. We are doing height mod surveys. But you need to kind of ground control what you have got for geoid models. And having a passive network gives you that opportunity but with the amount of change that we seem to hear that

is taking place right now, setting a passive control network of any size in a year, two years' time is going to be questionable, possibly. And I just don't know what steps they might be able to do to check this new data release of the Louisiana area if they don't do height mod surveys.

MS. BLACKWELL: This is Juliana. They have been doing height modernization surveys. And the area in question in particular of the subsidence region is probably the lower one-third of Louisiana. And as you go up past Interstate 10 and further north, that starts to drop off. So the significant area of interest is I-10 and below.

Starting in 2004 and then repeated in 2007 or 2008, there have been GPS surveys done on some of these old existing marks to update the elevations using GPS. And then to use estimated subsidence rates to help try to improve the information about the heights and

what is happening along this southern third of Louisiana.

And so we have been working with LSU and other entities within the state to try to bring the elevations up to the best -- in the best possible way without re-leveling across the state. Because as soon as you finish re-leveling it is going to change.

So at least having, let's say every three or four years going back to the same marks and re-surveying them using GPS, using common standards and methodologies, will give you an idea of how much those heights are changing relative to the ellipsoid, the GPS heights that you are going to get.

So that is the current way and the way that Louisiana has utilized their height modernization funds and program is to put in a GPS network, the C4G network, the CORS stations is to use CORS as the baseline, the established starting points for their heights.

So that is the direction that they

should have gone and they have gone but then the idea is you need to go back and re-measure marks that are in a subsidence area to see what their rates are and that is going to take time to build that information as to what is really happening, especially if your GPS heights are not accurate to more than one to two centimeters. So you can go out there and collect data but you have got to do this repeatedly over time, just like with the tide gauges to see what the trends are. You can't just do it one year and be done with it. You have got to keep going out there and re-measuring it and do this in a systematic way, which is why our partners in Louisiana need to continue this effort. And we have tools and opportunities for them to continue with height modernization surveys but the data have to be collected and it has to be looked at in a rigorous way to try to improve the understanding of what is actually happening.

And each mark and each area is

different. These are variable rates of subsidence. It is not something that you can say everything is going at two centimeters or one centimeter or half a centimeter. You can go ten meters away and you will have something different because you don't know exactly what is happening geologically underneath that. So it is not an easy place to survey.

CHAIR WELLSLAGER: And I wasn't trying to --

MS. BLACKWELL: The GPS really is the way to go but it is going to take a lot of effort and a lot of repeatability, as well as an improved geoid model. The idea is once there is a better geoid model from GRAV-D, then you can go down there and you can just take your GPS measurement and you will get a height that is relative to local sea level and know that repeatedly you are getting that accurate information but we are not quite there yet.

CHAIR WELLSLAGER: Gary.

MEMBER JEFFRESS: Another thing we've started and I know CO-OPS has started, too, is co-locating CORS stations with tide gauges. And we have three in Texas already and we have plans for at least another two. So you can actually measure subsidence and sea level rise at the same time.

CHAIR WELLSLAGER: Yes, Lawson?

MEMBER BRIGHAM: Lawson Brigham. Two things. One is about one topic discussed this morning. And then the second thing I had was about our D.C. Silver Spring meeting. So I don't know if you want to talk about that.

But the thing I took one very focused issue, was the lack of a fog sensor at the entrance to the Mississippi River. It seemed like a couple of the pilots mentioned that as an issue. And I don't know what that entails or whether actually the sensors should go on the end of the opening of the Mississippi or on one of these bridges.

So I wonder what -- maybe Rich

could comment about that.

MR. EDWING: Yes, the visibility sensor -- Rich Edwing with CO-OPS.

The visibility sensors were developed for the PORTS program. It was one of the two remaining highest priority parameters that people were asking for was visibility and waves. And we deliver waves through an Army Corps of Engineers partnership.

But anyway, so if they want to ask for it through the PORTS program, that is how I provide it. I don't have any base-funded visibility sensors out there. They are just out there through the PORTS program.

MEMBER BRIGHAM: Well, they should ask.

MR. EDWING: They should ask and come with a check. They have to have the funds for the establishment of that and the maintenance of that sensor.

MEMBER BRIGHAM: Do you want to

talk about D.C.? Yes, I mean I think if we -- you keep saying Silver Spring and I keep thinking about D.C. and I think they are kind of the same place but different. I actually think we should meet at least one day on the Hill, if that is possible with this panel, with maybe the Ports Caucus and the CMTS and I don't know, whoever else is dealing with these issues. But we in the senior leadership with NOAA should meet with staffers actually on the Hill for a day. I mean it doesn't have to be all three days. We would never get their time -- or an afternoon or whatever.

But I suggest that we actually physically meet with them, with the staffers on the Hill, if the administrator is comfortable with that.

CHAIR WELLSLAGER: Well, I will have to ask Kathy. I couldn't agree with you more. And the proximity would make it far easier for them and less of a reason why they say they can't make it if it is on the Hill.

But I guess the one question I have is are there facilities at the Commerce meeting downtown where we might be able to do a two-day meeting, per se?

MS. WATSON: Yes. Yes, there is. There is conference rooms there at Commerce where we could get those reserved. We just have to know in advance.

CHAIR WELLSLAGER: Okay.

MS. WATSON: And there is other federal agencies that if we can't get Commerce, there is a few others that we could use, too.

CHAIR WELLSLAGER: Lawson?

MEMBER BRIGHAM: Yes, I would just add it seemed like David and Margaret, when we had the little discussion about D.C., were comfortable with that. But it is all up to the administrator whether she thinks the panel -- can we do that. And if we can't do that, can some of us meet with staffers with or without NOAA handlers or supervisors or

colleagues. I mean, I don't know. Can we have dialogue with staffers not altogether? Is that an option if we can't have them actually meeting together with the staffers and the senior NOAA leadership, then who can we meet with? I mean it is a question for me.

CHAIR WELLSLAGER: That would probably be something we need to bring up to the General Council and check with them to see if that could be done. I'm not saying that is not a bad idea. It is probably an outstanding idea and it would be one where we would probably have a greater luck of being able to meet. But first off, let's see if we can do something like that legally.

David.

MEMBER JAY: Yes, Rich, a question for you. David Jay here.

Not to put you on the spot but I was noticing with the air gap data when we were trying to get those through Hurricane Sandy, the air gap sensors do not display the

way tide gauges and other assets do. I mean, I know they aren't tide gauges but you can't get the archived data. You can't display for arbitrary time periods and that sort of thing. Is this because they are new sensors or is there some systematic reason for this?

MR. EDWING: Rich Edwing. I think we can get you that data if you are interested in it. We may not make it available on the website because we probably just didn't think beyond what is being displayed in real-time that there might be much interest. It is not water level data, per se, although you could look at it that way.

MEMBER JAY: I mean, it seems like why not treat it as water level data?

MR. EDWING: Well I could certainly take that back and look into it and I will get back to you.

MEMBER JAY: All right, thanks.

CHAIR WELLSLAGER: Okay, Jon.

MR. DASLER: I was just going to

provide some historical perspective. But Scott Rainey when he was chair, they did go to the Hill before. I mean they didn't take the whole panel but the chair and they took a few people and they testified on the Hill and they also went around and met with staffers. So there is some precedence for that. But yes, I don't think you would want to take everybody going around to talk to staffers. You would probably want to select a smaller subset.

CHAIR WELLSLAGER: Great, thank you.

Frank?

MEMBER KUDRNA: The other FACAs I served on did also. The Sea Grant Review Panel routinely had their executive committee. They didn't do the whole panel go on the Hill, talk go the Appropriations Committee, talk to the Authorizing Committees, talk about things both in terms of appropriations and then in terms of reauthorization.

The Science Advisory Board, every

time there was a report, the leadership and the chair of the working group were required by NOAA to go on the Hill and they set up appointments for them to take their report to the appropriate committees on the Hill. So there is precedent for it.

CHAIR WELLSLAGER: Interesting.

Scott?

VICE CHAIR PERKINS: Is there consensus or agreement that meeting on the Hill in the Rayburn Building would be a positive step? I mean, I think we have got to actually start getting down to the grass roots. So we are in agreement in Washington, not Silver Spring and then location. So it may be one day in the administration building and one day on the Hill. Because one, we won't get the room in the Rayburn building for two days. I'm pretty sure of that. But I think we can get a meeting room in the Rayburn Building which is centrally located for the House side of Congress.

Anyone in opposition to that strategy?

CHAIR WELLSLAGER: No.

VICE CHAIR PERKINS: Great. So then I think the next order of business is then looking at the calendar and at least targeting some dates. Congress is typically in session the first three weeks of March. You can pretty much count on that. I mean, 2013 congressional calendar, I don't have a copy of it. I'm not sure they have released an official one. Craig, have you seen anything?

But I mean with that basic assumption, the Science Advisory Board is meeting on March 3rd and 4th in D.C. So it has been suggested that we try to perhaps do a meeting concurrently or consecutively with another FACA. So the Science Advisory Board would be, at least they have a scheduled date. We don't know where they are meeting but we know their dates. That is on their website.

So how is that first week of March?

CHAIR WELLSLAGER: March 3rd is a Sunday.

VICE CHAIR PERKINS: Yes, it must be the 4th and 5th then. I am doing it from memory, which is dangerous.

Anyone have any objections to the first week of March? Okay.

CHAIR WELLSLAGER: As it stands, I don't. Not right now. But I don't know what my calendar is, either.

VICE CHAIR PERKINS: Yes, I don't know what mine is either. But I mean at least we have got to try to move forward in some fashion.

CHAIR WELLSLAGER: I know Joyce had wanted to try to do something but she is going to be out. What does the calendar for -- and this is going to be moving it up by six weeks but I think she mentioned something about the middle of April. She was going to be on a cruise and she was very interested in

trying to do the meeting, if it worked out, and then suggested something about April. Would that be too late to try to meet with -- have our meeting?

ADMIRAL GLANG: Gerd Glang. If you want the driver to be an opportunity to interact with the Hill, then that is how you should probably adjust your calendar for the meeting. And that may mean Joyce isn't available. So I guess we have to start somewhere with what is important, notwithstanding the fact we first need to check into how much of this interaction can we actually do.

The point is to make the panel available during an opportunity when they can interact with the Hill.

CHAIR WELLSLAGER: Which it is.

ADMIRAL GLANG: Then that should probably be the thing that --

CHAIR WELLSLAGER: The focus.

ADMIRAL GLANG: -- the focus.

CHAIR WELLSLAGER: So be it. All right.

Well then, if we are going to be meeting on the Hill and on the other -- I don't know. Where is the Rayburn Building? Is that the Hill?

VICE CHAIR PERKINS: Yes.

CHAIR WELLSLAGER: Okay. Sorry, I ended up in that neck of the woods. But I think there is only one out there.

We are going to definitely need to sit and have some definite talking points. So before this, and this is something that Lawson had brought up before, we really need to come up as a committee with a list of priorities. And those priorities should include things that we have talked about, i.e., stratifying, if you want to use that term, the ten most wanted and conceptually changing the paradigm so that we can, instead of asking for more money, define ways of improving things within NOS and NOAA and come up with five topics.

That way, that should be something we could do and, at the same time, if there were other things that we have discussed today or yesterday or, for that matter, from Alaska that need to be readdressed, we should also come up with those.

And I think this, I mean, we haven't had a chance to really think about it right now but I am going to throw the seeds out because now if we know we are going to the Hill and we know that we are going to be trying to sell two very influential people things that NOAA does and outreach for NOAA, what would be the best way to do this? And I want you to think about that.

Tomorrow we will have time in the afternoon, after probably about two o'clock on to really put some thoughts and pen to paper and come up with ideas. And that would be for the recommendations of this meeting but even more so for thoughts and ideas of what we are going to be doing on the Hill in the next

meeting because March is right around the corner. It is going to be here before we know it. And we are putting rubber to the road. So everybody is going to have to put some thought into coming up with some ideas. We will combine those together and hit the talking points.

MEMBER JAY: David Jay. Don't we need to communicate with some of our stakeholders so that they are up there with us? They certainly generously offered to do so today.

CHAIR WELLSLAGER: Yes, we can do that. And I had collectively talked to three or four different people. And I asked Tim if he would mind being a point of contact since he knows the people and he had no problem with that. Collectively, they had no problems if they had a week, maybe two weeks' prior notice of coming up. They could rearrange schedules that way. Henri might have a little bit harder time but if we can nail down some

dates, I'm sure he could probably work on getting up and making himself available to work with us as well.

CHAIR WELLSLAGER: Bill.

MEMBER HANSON: Bill Hanson. Yes, it is very convenient. March, there is another March madness besides the basketball. It is the descent upon D.C. during the budget season and during appropriations season. So the guys that we will have there, the folks you saw today from around the country are all making their treks to D.C. between mid-February and early April multiple times. They would love to be there for something specific and focused like this would be. So this would be a fairly large event for most people.

CHAIR WELLSLAGER: Andy?

MR. ARMSTRONG: Andy Armstrong. I just would like to make an observation that a lot of what I heard on the panel in terms of funding was related to spending the Harbor Maintenance Trust Fund on what it was intended

for. And reading between the lines, that sounds to me like dredging.

So I would say we need to be sure that we understand the message that we are trying to send about funding that we don't end up promoting the use of the Harbor Maintenance Trust Fund and then find out that it is not going to solve any of the problems that this panel is dedicated to solving. I think that there needs to be some discussion about that with constituents because we may end up on the wrong side of that issue, if we are not careful.

CHAIR WELLSLAGER: Ken?

MEMBER BARBOR: No, I agree with Andy and to a larger -- I mean, Henri's presentation was compelling but I'm not sure I saw hydrographic services in there. And you can say I agree with the same thing.

Yes, dredging is an important aspect that leads into hydrographic services. Whatever money comes there doesn't land in any

of the NOAA pockets. Not that it is not a good thing.

CHAIR WELLSLAGER: And those things, funds are more of an issue for the Army Corps of Engineers in the maintenance of the channels and the dredging there.

For whatever it is worth, we had collectively people, if they didn't say it one time, they said it six times, we will be glad to go up and try to do whatever we can to help out. So okay, I tried to run with it. I fumbled but, hey, we can pick it up and try doing something else.

Jeff.

MEMBER CAROTHERS: Yes, Jeff Carothers. I also agree with Andy. We don't want to get into a similar conversation here about infringing on the Corps' mandates. But I think this whole electronic navigation and something that they are bringing in Corps data into. So maybe it is an opportunity to say yes, the Corps is doing their thing but we are

going to really focus on PORTS and electronic navigation but we are going to use Corps data to help supplement the areas that show all the water.

So I don't think we should totally discount it but like I said, I don't think we should be getting into the dredging business.

CHAIR WELLSLAGER: Well and again, this is what we should be doing, talking about things and coming up with ideas. And it is good to head-bone like this because without that, we would be sending the wrong message. And we don't want to do that. We can't afford to do that. We are going up for a specific mission. So let's make sure we have got what we want to talk about ready when we do that. I agree 100 percent.

Evelyn.

MEMBER FIELDS: I agree with what has been said but I also heard things that are related to what we are interested in in that they are talking about the cooperation that

they get with NOAA or from NOAA especially during emergency times, hurricanes, whatever. I heard the group talking a lot about that interaction in addition to the Corps activities for dredging and so forth.

So I would think that we would be focused in on those activities as opposed to -- and their support on those activities as opposed to the dredging, as Andy said. But I don't want us to forget that they talked about more than just dredging. I mean, that was certainly a lot but they talked about a whole lot of other things, too. At least that is what I heard.

CHAIR WELLSLAGER: No, I agree. Sorry, Bill.

Frank.

MEMBER HANSON: No, just the inflection.

CHAIR WELLSLAGER: Sorry, Bill.

MEMBER HANSON: It's dredging, not dredging.

MEMBER KUDRNA: Matt, let me try a theme for this when we go to Washington. And Randy Lyon who is the head of the division that handles the budget examiners for NOAA once told me, we are not in the business of making numbers bigger. We are in the business of making numbers smaller, which is what the framework is in Washington.

But I think we could tie together a number of the things that we are going to look at in the top five into a theme that, in terms of ports and waterways, a number of things are going to occur. Panamax vessels are going to be coming in. Ports are spending billions of dollars in terms of preparing for that activity. There needs to be charting, mapping, dredging, in order to accommodate these activities. The Northern Passage is coming after that and there is a need for those kinds of things in that particular direction and they all relate to jobs and economic activity for the country. And in

order to fully achieve those, certain things need to be done.

And then it doesn't sound like you are just whining for more money. You are talking about the benefits that are going to occur to the country for both jobs and employment and economic activity that the country is trying to spur on and get out of. And then you can go and you can talk about a reduced top ten list into five and you could talk about the need for mapping, charting, dredging, and those kinds of things we are collectively talking about not only here but in Alaska and the other ports.

CHAIR WELLSLAGER: I like that. Court reporter, did you get that? Can you reproduce that real quick? Very good.

Jeff.

MEMBER CAROTHERS: Jeff Carothers again. I agree with Frank there. I think in this climate right now if you can show NOAA is somehow creating jobs in the private sector

that would be a big, big sale.

One of the things I asked about this Raven system because I hadn't heard about it before. And it is a private company that created jobs, developed the software to take NOAA products in and make it useable for the end user. So maybe we could focus a little bit on those things.

I know it was Rich or Admiral that said now that they have been working on a unit that takes the AIS and electronic navigation into one unit or something like that. But to me that is something that NOAA can provide for stuff the AIS has provided by commercial industry. A commercial company developed this device. We set the standards for what the device could do but put it out for a commercial company to develop it.

Anyway, the point is if we could show NOAA is taking the money and creating jobs, I think that would be a big sale right now.

CHAIR WELLSLAGER: Rich.

MR. EDWING: Yes, just following up on that. Part of integrating PORTS data into AIS is there is a black box that sits on the ship's bridge. And there is a chicken or an egg sort of thing where even though it is capable of taking in this data, there was still some firmware and software that had to be developed. And it had to be developed by Raven or ARINC, and I forget who the third manufacturer is. And in Tampa Bay it was ARINC that stepped up and did some development.

And the idea is if we start getting this data out there, the other manufacturers or commercial entities will step up and not just do the application to get it in there but then start doing all sorts of other value-added applications.

So if we can kind of get the spigot going here, I think a lot of that is going to happen.

MEMBER CAROTHERS: Yes, that is what we need to get the point I think we need to get across.

MR. EDWING: Right.

MEMBER CAROTHERS: You know, hey, we are using these products. It's generating jobs and the whole country is going to benefit.

MEMBER DEMPSEY: Along with what Frank just said about the theme of the benefits, you know, is the idea of public awareness. I think that can be incorporated in the same thing -- outreach and education. Public awareness is going to lead to more funds.

CHAIR WELLSLAGER: All right. Yes, please.

ADMIRAL GLANG: Gerd Glang. Mr. Chair, have you thought more about the planning working group, that topic that was brought up yesterday, and possibly leveraging the working groups between an ad hoc group in

the next day? There are a couple of things going on that I hear. One is start thinking about producing what the output of this meeting might look like. And then the second piece is start thinking about what we want to do at the next meeting in March. And maybe one way to do that is just throw together or use some of the existing ad hoc working groups or a couple folks, draft it, and then bring that back to the next session of the panel tomorrow for the next group discussion. I'm just throwing that out as a suggestion.

Sometimes it is easier to have something in front of you and take it apart, rather than to try and build it from scratch as a group is what I am suggesting.

CHAIR WELLSLAGER: Right.

ADMIRAL GLANG: But that would require a few folks to spend a little time on it tonight.

CHAIR WELLSLAGER: Well no, I had not thought about that but that is a good

idea.

ADMIRAL GLANG: It is just sort of a first draft and then tomorrow maybe we are warmed up a little bit more because we will have a chance to have gone through and incorporate what we hear at the breakout sessions as well. So, just kind of do a little time management.

CHAIR WELLSLAGER: Right. Actually, that is a very good idea. And seeing what you had actually written here, Frank, would you be -- would possibly you and Evelyn and Deborah, would you mind working, since the three of you all had thought about this and try to spend maybe 30 minutes tonight coming up with a brief set of ideas that we might be able to use for the D.C. meeting? And we could address those tomorrow with what we are talking about as well from things that would be generated.

And Jeff, if you would like to sit in with that as well and your ideas with the

Raven, I think that would be very beneficial.

Nothing robust but just some ideas. I think that would be outstanding and quite helpful.

Good idea. Thank you! That is what the DFO is for, right? You have done it once or twice without having to reinvent the wheel.

Well we have got about 15 minutes before we need to have our public discussion. I have got one other question and I am going to address it to Rich because I have heard a couple of different things.

PORTS. When somebody wants to start a PORTS system, they come to you with a check or money and they pay for this piece of equipment that is going to go out or set of pieces of equipment that are going to go out into a harbor and be used for oceanographic readings, calculations, things that will then be sent to ship as they are coming into port. Correct?

MR. EDWING: Well, I would say before we get to the check part, they come to us with some problems and requirements. Okay? And we sit down with them. And then once we get past some initial discussions, we usually then kind of have a local stakeholder meeting to see what is really needed in an area, where you need more current meters, or tide gauges, or air gaps, or whatever. And then we can provide some cost estimates and they can see how much they want to -- how much they can afford, so to speak.

And then once they can come back to us and say yes, we can identify this level of funding, then we have to enter into a memorandum of understanding, an agreement. And then once that is in place, that is when the money, the funds can be transferred to buy equipment to fund maintenance contracts and things like that.

CHAIR WELLSLAGER: So that being said, then it is the issue of the initial

purchase and then the maintenance contracts would follow.

I have heard here, and I have heard in Houston/Galveston -- correct me if I am wrong but Portsmouth has a PORTS system, do they not? Do you have one that you work with in Columbia River? How is that funded for maintenance, do you know?

COURT REPORTER: Could you turn on the mike, please?

MEMBER DEMPSEY: Excuse me. Probably through the Port of Portland and they probably get it through FEES.

CHAIR WELLSLAGER: Well and that is where I am going with this. Tampa, I don't think, has a maintenance program, do they?

MR. EDWING: Yes, they do have a maintenance program. They have a consortium that raises the funds and they actually, they pass the funds to a Dr. Mark Luther, who is attached to the Florida State University. He does all the maintenance for them to the

standards that we provide.

CHAIR WELLSLAGER: Okay. Well, earlier on there was -- I am pre-dating myself now -- three, four, five years ago the idea was to try to get funding from the federal government to do the maintenance for PORTS. And I know of at least two or three letters of recommendation that something like that was written in.

And I am hearing about what is going on there, what they are doing here, obviously what is being done in Tampa. Would not a recommendation instead to say NOAA administration be one that it would be advised for the ports to collect some kind of a tax based on pilotage? Or wordsmith it however you could, but by doing something like that it is not going to cost the port any money. They are going to collect it from the ships coming in and they could use that as a system for maintenance. Is that something -- and I am throwing this out. I'm not sure, but is that

something that we, as an HSRP panel could make as a statement, as a recommendation?

Because the money is there and this could finally be something that would just lay to rest the idea of the funding for maintenance. And if we could sell that to the Hill, we could also say, look at the benefits from this because safety issues -- I can't think of anything right now. I'm tired. But the idea would be there are a lot of benefits that you would have if the PORTS systems were up and running at the various ports. And if what it takes is a maintenance plan and that has been the straw breaker, well, we are also saying this is how you could do it and it would be the recommendation of collecting a pilotage fee that would be passed off from the ship to the port and then the port could then turn around and use the money for the maintenance of a PORTS system.

Bill?

MEMBER HANSON: Yes, Matt, I think

one of the things we have tried to do since I have been part of the panel is identify what it is that NOAA, NOS does well and how to push for that without talking about how it gets funded and that kind of thing. Maybe a compiling of how it is done in different places because each port is completely different. They have different management and different schemes.

But going to the Hill and saying this program only works if you fund it is kind of a hypocritical message. We are engineers, scientists, geeks. We have got products we think our stakeholders can use and we really don't care who pays for it.

And if the message is, it only works if there are federal dollars, I don't think that is a very good message for us to present. And whether the states pay for it, the ports pay for it, the pilots pay for it, if it is a good product, then that is why NOAA should be researching and producing these

types of products.

MEMBER JAY: I guess I would comment in a slightly different vein. I think one of the issues may be about doing a case-by-case basis is that everybody is reluctant to raise the costs in their port. So anything that costs more money is a bad thing that they have to pass on to the customer.

Whereas, I mean something along the lines of the Harbor Maintenance Trust Fund, everybody pays into that, all ships coming in. We actually do have some wording in the strategic effectiveness draft document, which I don't think we have ever reviewed as a group, suggesting that possibility. Even if the Harbor Maintenance Fund is not being used as intended now, is it a model?

MR. ARMSTRONG: I think I heard you say that we would suggest that Congress require the ports to collect a fee to pay for a PORTS system everywhere. And I am not sure that --

CHAIR WELLSLAGER: No. If that is what I said, that is not what I was trying to say. What I was insinuating or trying to state was instead of getting funding from Congress or from NOAA to fund these things, instead it would be something that would be -- the funding mechanism would be created from collecting a tax, if you will, based on the ships coming in and exiting and using that tax money or pilotage fee, or wordsmith it the way that you want to, but somehow collecting the fee from the ships, since they are using the PORTS system and placing that fee towards the maintenance of a PORTS system. Not getting the Congress to pay for something. I think in the past that is what we had been trying to say should be done but instead I am saying no, that is not what we want to do. Instead, why can't we put the burden on to the port of choice to have them collect the money and by doing that, they can pay for the maintenance.

And what I am in essence saying is

HSRP could make the stance we recommend the use of the PORTS system. It is beneficial and can be shown to be beneficial by a variety of different ways but, and maybe this isn't something we should say now that I am thinking about it out loud, but by doing this it would be something that we throw the onus of the support back onto the shoulders onto the actual port itself, instead of trying to get the federal government to pay for the maintenance.

So thinking about loud sometimes that is when I find out, well, maybe it isn't such a good idea but it was a thought that I had for a moment.

MEMBER DEMPSEY: User base, you know, what does one of these things cost?

MR. EDWING: Well, it really depends on the size of the port. I mean we have some ports that are not much more than a water level station with a couple of meteorological sensors to ones that are

multiple. So it can range from $100,000 to a million easily. So it just really depends on the size. Again, every port is different, so they have different needs.

MEMBER CAROTHERS: It sounds like an education problem. You know, the pilots here got used to it and now they can't live without it. So they are willing to pay for it. And I was talking to Captain here today. The real users of the system are the pilots in most ports. It is not the ship owners. But the pilots have to use it to do their job. So they should be able to charge for paying for something they need to do their job with. That is what makes sense to me.

VICE CHAIR PERKINS: Food for thought. Maybe we are looking at this at perhaps a micro level and the focus on ports is just one piece. I mean, the new NOS tag line is Positioning America for the Future. We have a universal problem, which is a lack of funding for the programs that are essential

to be able to provide Positioning America for the Future. So whether it is GRAV-D or whether it is PORTSþ, you know, we can go down the list but the problem is universal.

So just food for thought, maybe we should be talking about a positioning user fee that is ubiquitous and could collect revenue similar to what the fishing license in the marine, you know, sales tax item does.

Could this group put forward a message to the Hill about the benefit of a positioning user fee, one cent for every GPS-enabled device that is sold? And then that revenue could come through and fund all of these programs, potentially. And then there would be a body put in place that would decide who gets how much of the pie, what slice.

I mean how many spatially-enabled devices will be sold in the next five years? And ten cents a device? A dollar a device? We could solve our own problem relatively easily and you are not asking for a

Congressional spend then. You are asking for good governance.

Pardon me, Ken?

MEMBER BARBOR: What would Grover Norquist say about that?

(Laughter.)

MEMBER BARBOR: I think that is --

VICE CHAIR PERKINS: It works for the sport fishing industry. I mean it raises funds and it protects habitat and estuary and it has been in place for decades. And the sportsmen love it and they pay it gladly and they advocate for the continuation of it. You know, Ducks Unlimited and on down the list. These programs for the users, you know, embrace them, work. And we have got a big user base out there. We can have people come in here and talk to us all day. We have got other users that would help advocate for this.

MEMBER CAROTHERS: The only problem with that I see is it collect the fee, and it is going to drop in the general fund.

I guarantee it.

MEMBER KUDRNA: I guess my preference would be to show the benefits of these programs and the need and initially be silent on exactly how you fund it. Because if you lay one thing out, you are going to get opponents to it immediately because that is the taxing method you suggested.

And the other thing I was going to suggest is maybe our committee that just got this new assignment would maybe meet for breakfast at 7:30 tomorrow, take some notes, and we will sit at a table and work something up for the group tomorrow morning.

I had one other comment. Scott suggested the idea that we think about doing something associated with a cruise. And Matt and I talked and he said that there was some heartburn in the past because being on a cruise you are going to the Bahamas or something and it wouldn't be American. And I called a little while ago the Executive

Director of our Great Lakes IOOS Regional Association and we have cruise ships on the Great Lakes. And the Great Lakes have some real issues right now with low water levels. And they are smaller vessels and they are tied to environmental education programs that they do on the vessels themselves. And we could probably, when we do a three-day meeting, we could do something one way, in one direction or the other, you know Chicago-Detroit, Cleveland-New York or something, and get to experience the cruise side of the issue, the recreational boating side of the issue that has severe problems with low water, and stay entirely within the United States and probably make some arrangements to do that pretty economically.

CHAIR WELLSLAGER: I like it! It would be crazy to say no. Logistically though, Kathy, I have to look to you since you have kind of gone through this in the past. What would be involved in the logistics of

trying to organize something like that?

MS. WATSON: Well, if the cruise ship industry wants to sponsor the meeting, there should be no problem.

MEMBER KUDRNA: Well, we'll have to work on that.

MS. WATSON: But if you are expecting the federal government appropriated funds to pay for that, I don't think that would go very well.

MEMBER KUDRNA: Well, I guess we pay for our hotels right now. So something equivalent to what the hotel per diem in three cities might be able to negotiated with the cruise line or something.

MS. WATSON: Yes, your per diem, yes, could be covered through HSRP.

MEMBER KUDRNA: Yes, per diem and the hotel equivalency. That might do it.

MS. WATSON: But the other meeting logistic stuff, that is very difficult. You have to be careful with that. You know, the

perception of appropriated funds.

MEMBER KUDRNA: Understood. But as I say, I have been working for years to try get NOAA to figure out where the Great Lakes are and this would help along those lines, too.

MS. WATSON: Well actually, Frank, the HSRP was in the Great Lakes --

MEMBER KUDRNA: They were?

MS. WATSON: -- back in 2009, the fall of 2009. And Matt, you were there. Correct?

CHAIR WELLSLAGER: Yes.

MS. WATSON: Right, in Duluth. And there is information on the HSRP website on the presentations and --

MEMBER KUDRNA: Okay.

MS. WATSON: -- information that was discussed back then. So I would suggest going to that area and reviewing it.

MEMBER KUDRNA: All right. I will see if I can get some information, some

potential contacts, if you agree Mr. Chairman.

CHAIR WELLSLAGER: I mean if you don't mind doing the footwork, by all means. Anything I think would be beneficial to have.

It is a quarter past. All right, is there anyone here that would like to take a moment and address the panel from the public comment period? Mr. Dasler.

MR. DASLER: Jon Dasler. Since you are talking about PORTS, I just again wanted to add some historical significance from the HSRP perspective, because this has been going on since HSRP started back in 2002, ten years ago.

So we had a meeting in San Francisco and it was shortly after the Cosco Busan incident in 2008. And Captain Korwatch at San Francisco Marine Exchange said the Marine Exchange actually funds the ports operations there. And although the PORTS system brought a lot of attention to the PORTS system, there were some problems with faulty

sensors. I mean the Marine Exchange wasn't really able to maintain funding. Some of the current meters weren't operational. The Cosco Busan, the leading cause of that was not only just fog but was also currents, tidal currents at the time. And I think it was raised at that time to really move PORTS forward. You really, somehow, you need to have a funding base for that. And it really isn't fair to stand up a PORTS system and then say here you go, you have to maintain it.

And I think even CO-OPS raised issues, especially from a tidal perspective, you can't just have anybody go do maintenance on a tide station. There is a lot of criteria that needs to be done for that.

So I would just encourage, as PORTS are pushed forward and there needs to be a more stable base for that. I guess we have been arguing this for ten years on how that is going to happen. And if that can go through that but like the Pilots Exchange said, we

can't afford this anymore and we are not going to be able to maintain it. And it was falling by the wayside and then you have the Cosco Busan incident happen.

I guess I wouldn't take that off the table. I mean if a pilotage fee is going to work or getting some stable maintenance to it. Because you can spend all this money on the installation of a big system like that but if you can't properly maintain it, it can do more harm than good because people think it is going to work and then it doesn't.

MR. EDWING: Rich Edwing. So what happened now in San Francisco with that system was originally established with some funds from the state, I think it is OSPR, Oil Spill Prevention something to prevent oil spills. But over the years when their funding -- they had funded the establishment but never really provided any funds to maintain. And when Cosco Busan happened, really that port just withered down to just a federal

infrastructure. Our NWLON stations were operating. The current meters had all stopped operating at that point. They couldn't keep them going and they would have been very helpful during that oil spill. It wouldn't have prevented the oil spill but it would have certainly improved the response.

So now of course after that oil spill, they have got a new influx of funding and now they have expanded that PORTS out again and reestablished the sensors that had gone down and I think they added others. But I am not so sure how stable their maintenance funding is. So they could be going into another cycle. So I appreciate your point, Jon.

CHAIR WELLSLAGER: Admiral?

ADMIRAL GLANG: Gerd Glang. I just wanted to recognize Win Ellington from Senator Cochran's Office from Mississippi. Win, this is your opportunity if you wanted to provide any --

MR. ELLINGTON: I'll be here tomorrow.

ADMIRAL GLANG: You will be here tomorrow as well? If you don't want to wait to the end of the day tomorrow, though, to provide comment, please let us know.

MR. ELLINGTON: I'm just very glad to be here. Thank you all.

CHAIR WELLSLAGER: Anybody else from the public? And I guess that would be it. Regular conversation, Dave?

I think with what we have got with the committees for tomorrow, it was going to be meeting in the breakfast. We have got Evelyn, Frank, and Jeff, and Deborah. So they were going to put that together.

ADMIRAL GLANG: And which committee is that? What is the expected outcome -- output?

CHAIR WELLSLAGER: The output? No, this is the one for the planning subcommittee that is going to be coming up in

the Washington, D.C. area.

ADMIRAL GLANG: Okay.

MEMBER DEMPSEY: The Admiral is welcome to join us.

ADMIRAL GLANG: I just want to make sure that our little ad hoc working groups and subcommittees have a purpose. I want to make sure that we come away at the end of this meeting with a clear product and a clear direction where we are going. Because Matt is going to have pick up the pieces and Kathy will beat him up if we don't get the letter out.

MS. WATSON: Absolutely.

MEMBER FIELDS: I thought that was the recommendation or the suggestion was to have a second group that put together a first draft of recommendations, based on what we have done up until now or what has been done up until now.

CHAIR WELLSLAGER: And that is the other ad hoc committee that Admiral Gland had

mentioned that we should create as well.

Would you like to work with that? Say again? The second ad hoc committee, Gary, could I get you to help out with that? And Scott?

VICE CHAIR PERKINS: Sure.

CHAIR WELLSLAGER: And Lawson, how would you like to -- that's right. Frank, could I get you to -- I'm sorry. Ken, I'm looking at you and thinking Frank. My bad.

So we have those that we can meet together and discuss what we could put together for a draft. Very good. So that should take care of that.

Yes, ma'am?

MS. WATSON: Matt, let me clarify this. So there is two ad hoc groups. One is a planning ad hoc group, which is Carothers, Dempsey, Fields, Kudrna. Correct?

CHAIR WELLSLAGER: That is correct.

MS. WATSON: That is to prepare for the March meeting.

CHAIR WELLSLAGER: Yes.

MS. WATSON: Okay and what is the other ad hoc group?

CHAIR WELLSLAGER: The second ad hoc group would be the drafting subcommittee. And that would include the Chair, Vice-chair, Dr. Jeffress, and Ken Barbor.

MS. WATSON: And the purpose of that one is?

CHAIR WELLSLAGER: To come up with the recommendations for the letter to NOAA administration from this meeting.

MS. WATSON: Excellent. Okay, great. Thank you.

CHAIR WELLSLAGER: Yes.

MS. WATSON: Okay and Matt, one other thing. Could you please share to the panel about tomorrow morning, where the breaks are, the stakeholder breakouts?

CHAIR WELLSLAGER: Yes. The breakout -- you know, they are upstairs almost directly above us. Correct?

MS. WATSON: Right.

CHAIR WELLSLAGER: Because I never actually got the tour. You told me when we got here and I -

MS. WATSON: Right. Okay, the Chair volunteered panel members, one person to serve as a facilitator for each breakout session and one person to serve as a scribe. So for the hydrographic charting, I believe it is Bill Hanson. The geodesy, I'm not for sure who the facilitator -- I don't have it in front of me. And then of course -- and then the tides current water levels.

And there are meeting spaces, meeting rooms on M2, which you just go to the elevator and come down the same hallway here. And it is actually on the agenda which room you are going to be in. And there is flip charts in there for you to use to capture the issues, recommendations, opportunities, or whatever.

MEMBER CAROTHERS: Do we know who

is on these breakouts?

CHAIR WELLSLAGER: As a matter of fact, we do. Funny you should ask. What I have got now set up for the hydrographic surveying, it is going to be facilitated by Bill Hanson. The scribe, if she is feeling better was going to be Joyce Miller. Then I was asking Evelyn and Frank to sit in on that panel discussion.

For geospatial, we have got the facilitator as Gary Jeffress and Carol was going to be our scribe there. Lawson and Jeff Carothers were going to sit in on that.

The tide currents and water levels was going to be Ken as the facilitator, Ken Barbor and Susan was going to be our scribe. And David Jay and Captain Dempsey, Deborah Dempsey were going to sit in on that.

And I think that covered everything. Myself and Scott were going to go from different ones to check and see how things were going. And that pretty much, I

think, covered everybody in here.

Yes?

MEMBER DEMPSEY: Excuse me, Chair. I'm confused not about the breakout sessions but so there is a committee meeting tomorrow to do the first draft of recommendations for our letter to NOAA?

CHAIR WELLSLAGER: That is an ad hoc committee that I am going to be working on tomorrow, yes.

MEMBER DEMPSEY: Is that the top five or the top ten?

CHAIR WELLSLAGER: No, no, no. This is going to be the letter of recommendations that is going to come from this meeting going to NOAA administration.

MEMBER DEMPSEY: Okay, the top five, top ten is going to come out of our ad hoc committee?

CHAIR WELLSLAGER: Yes.

MEMBER DEMPSEY: Okay.

CHAIR WELLSLAGER: Yes.

MEMBER DEMPSEY: Thank you.

CHAIR WELLSLAGER: Yes, sir?

MEMBER BRIGHAM: You know, when we talked about this -- Lawson Brigham. When you talked about this planning meeting, you were actually going to be on it. But I really recommend that the vice-chair or the chair be on the planning committee for the next meeting. I mean, I hate to volunteer you guys but I just think it -- just because you are going to create this meeting with the NOAA staff later, that maybe you ought to be right there at the beginning. Sorry to volunteer you guys but, it just seems sensible to me.

CHAIR WELLSLAGER: I agree.

VICE CHAIR PERKINS: Point well made. I think having the committee get together and maybe get the ball rolling. But you are absolutely right, they can't go forward without Matt, as the Chair, or myself. That is correct.

One small correction. I had said

Science Advisory Board for March 4 and 5. And it is the Sea Grant Advisory Board, not Science Advisory Board. It is the Sea Grant group that would could dovetail with, if we chose to.

MEMBER CAROTHERS: Can I suggest maybe that you guys break up tomorrow, I guess?

VICE CHAIR PERKINS: Yes. In the afternoon?

MEMBER CAROTHERS: Yes.

VICE CHAIR PERKINS: Yes, that is correct. That was in the intent. We have three stakeholder groups and so Matt and I were going to tag team and see if we couldn't help facilitate and keep the conversation moving along, as opposed to in Anchorage where we were each captive in one.

CHAIR WELLSLAGER: That's what happened last year up in Anchorage. I stayed in one --

COURT REPORTER: Would you turn on

the mike, please?

CHAIR WELLSLAGER: Sorry. The idea was to instead of staying in just one, being able to move around and interacting with all three. That was something I missed out on last time. I wanted to have the opportunity.

And Frank, if you don't mind, I would like to sit in with you all tomorrow morning. That would be a good idea.

Dinner, 6:30 downstairs in the lobby, Kathy? For those interested in going out someplace, if you don't have plans. So others will, if they want but for now I think the meeting is over. And we will adjourn tomorrow morning at eight o'clock. No, wait -- 8:30, I think. Correct? Breakfast is at 7:30 and the meeting starts at eight. All right, thank you very much.

(Whereupon, at 5:27 p.m., the foregoing proceeding was adjourned to reconvene at 8:30 a.m. on Thursday, November 29, 2012.)

D

C E R T I F I C A T E

This is to certify that the foregoing transcript

In the matter of: Hydrographic Services Review Panel

Before: DOC/NOAA

Date: 11-28-12

Place: New Orleans, LA

was duly recorded and accurately transcribed under my direction; further, that said transcript is a true and accurate record of the proceedings.

Neal R. Gross

Court Reporter