Meeting Summary
Hydrographic Services Review Panel
September 16-18, 2014
Charleston, SC

Tuesday, September 16, 2014

On the call of the Designated Federal Official (DFO), Rear Admiral Gerd F. Glang, NOAA, the Hydrographic Services Review Panel (HSRP) meeting was convened on September 16-18, 2014, at the Courtyard Marriott Historic District, 125 Calhoun St., in Charleston, SC. The following report summarizes the deliberations of this meeting. The agenda, presentations, and documents are available for public inspection online at

http://www.nauticalcharts.noaa.gov/ocs/hsrp/meetings.htm

Copies can be requested by writing to the Director, Office of Coast Survey (OCS), 1315 East West Highway, SSMC3, N/CS, Silver Spring, Maryland 20910.

Opening Remarks – National Ocean Service (NOS) Priorities, Coastal Intelligence & Resiliency

Scott Perkins, HSRP Chair

The meeting was called to order at 9:00 a.m. Chair Perkins welcomed the attendees and led the Pledge of Allegiance. The Chair then invited the panel to introduce themselves.

Dr. Russell Callender, NOS Deputy Assistant Administrator

Dr. Callender discussed NOS priorities, focusing on two that he felt were especially relevant to the HSRP, coastal intelligence and resiliency. NOS has finalized a roadmap featuring hoped-for outcomes, including improved community preparedness and response, with a goal of making coastal communities capable of applying relevant criteria and standards to enhance preparedness and recovery. Enhanced and integrated decision support tools for coastal communities to meet the needs of expanded commerce are a major focus area for coastal intelligence. The roadmap functions as a way to cluster activities around the major priorities that have been identified over the last 2-3 years and has had a positive impact on how NOS is viewed from the outside and its ability to elevate its priorities to become NOAA and Department of Commerce priorities. Congress also responded positively to the plan and the appearance of a more unified organization by increasing the FY2014 budget for NOS.

The mantra of coastal intelligence is to develop relevant, actionable information. The White House Office of Science and Technology Policy has identified Airborne LiDAR and the National Water Level Observation Network (NWLON) as two of the nation's 15 highest-impact observing systems. These systems are especially relevant today as ships increase in size while most waterways are not expanding, making the need for improved coastal intelligence critical.

The PORTS program's economic valuation study of its system found that the US would see a $300 million annual benefit if 175 of the country's ports were supported by the system. Demand for PORTS has been increasing but it represents only a small portion of NOS's work – charting, positioning, and other navigation-related products and services are extremely valuable to stakeholders as well.

Coastal intelligence serves as a foundation to resilience and these two together address the risks that stem from increased shipping as well as weather/climate impacts. Seafloor mapping and coastal elevation data are critical for accurate inundation models. Tides are now being calculated into storm surge forecasts. NOS has released several resilience tools that rely on coastal intelligence, such as sea level rise (SLR) and a coastal flooding impact viewer. The Digital Coast website offers many more products.

Three major considerations will drive the future of coastal intelligence.

- Lower costs and more efficiency
- Increased accuracy
- Capacity for multi-use

Advancements in technology have made coastal intelligence tools far more affordable, while at the same time increased efficiency has saved users considerable maintenance costs. Topo-Bathy LiDAR acquires both elevation and hydrographic data to improve accuracy in areas with complex and rugged shorelines. This is valuable for purposes beyond nautical charting, including inundation modeling, habitat mapping, and coastal change analysis. The GRAV-D initiative will provide a better, faster, cheaper means of acquiring gravity data and provide more accurate elevations. This project will inform the next generation model for the earth's surface and enable fast and accurate height measurements within 2 cm.

The next steps in coastal intelligence will be to compile a variety of different stakeholders' needs to expand work being performed and make collected data more relevant to all of the coastal partners. There may be opportunities to utilize crowdsourcing but care should be given when considering data quality, especially in areas where NOAA is the authoritative source for coastal data. NOS is always striving to increase the value and utility of their data products and is dedicated to developing diverse platforms that integrate new and existing technologies. Several of the issues that coastal communities are facing need to be understood at regional and local levels, and require that tools be geographically tailored to suit their needs. NOS seeks to increase coordination and integration across products, improve data access, management, and interoperability, and find new industry opportunities.

Dr. Callender closed his remarks with a challenge to the Panel on two areas where NOAA can best utilize HSRP's advice, both as a conduit for strategic thinking and as a way to bring stakeholder needs to NOS and NOAA:

1. Advise NOAA on strategic issues:
    - Where's the science going?
    - What cutting edge technology should NOAA explore?
    - What opportunities might exist for new business models (e.g. PORTS)?
    - Are there opportunities for new partnerships?

- What coastal issues should NOAA be tackling? How?

2. Advise NOAA on regional, stakeholder needs:
    - Where are the gaps in NOAA's products and services?
    - What stakeholder needs are not being met?
    - Are there better ways to meet stakeholder needs?
    - How can NOAA better connect to and strengthen relationships with its stakeholders?

Dr. Callender said that the HSRP has provided tremendously valuable advice in the past and that the internal challenge has been a delay of response from NOAA to the panel's recommendations. There may be opportunities to provide advice between meetings and welcomes opening the door to increased dialogue.

Member Miller noted that PORTS has been included in many of the Panel's suggestions to NOAA and little response has come back. She asked if there was a better way to communicate its importance. Dr. Callender responded that the PORTS valuation study has been useful in engaging Congress and congressional staffers, even though there has not been much monetary support for the program. To some degree, it is up to NOAA now to push on this and it may be time for the Panel to focus on issues other than PORTS.

Vice Chair Hanson asked for more clarification on what new business models NOAA would be interested in. Dr. Callender replied that the door is open and they are always looking for ways to make NOAA data more available and relevant to industry. Conversations with the reinsurance industry have revealed a need to access data for enhancing catastrophic modeling across the country.

Member Kelly said that PORTS is one of the best products NOAA has produced but future enhancements (expanded modeling, AIS, etc.) need to be taken up and the possibility of federal funding needs to be addressed. Vice Chair Hanson agreed but added that full-federal funding has not made much progress; maybe an alternative solution should be considered. Member Blackwell provided an overview of the funding mechanism for the CORS network which has proven to be a successful model.

Member Jeffress commented on NOAA's University partnerships and discussed some of the developments that have arisen out of them.

Member Kelly suggested looking at how to cross-pollinate with academia, IOOS, OEM, DoD, Weather Service, and others users to achieve a broader coalition and greater focus on what data should be collected. Collecting fees from users of NOAA's services should also be considered. Dr. Callender agreed that increased integration is a critical item for him to focus on in terms of generating a larger constituency.

Member Kudrna asked if there has been any consideration of moving Sea Grant to NOS, because it could be enormously beneficial to the priority goals of NOS. Dr. Callender responded that there have been conversations with Sea Grant leadership about getting them more engaged with NOS.

Vice Chair Hanson commented that the term "resiliency" needs to have some metrics in order to sell long-term solutions. Dr. Callender responded that several organizations are attempting to develop metrics for resiliency.

Keynote Address

Jim Newsome, President and CEO, South Carolina Ports Authority (SCPA)

Mr. Newsome discussed how the Port of Charleston fits into America's port industry. Ports have really become integrated into the transportation infrastructure discussion in America, which is probably a result of the current big ship trend. Big ships are the major theme in the port industry today and which ports are able to handle them efficiently will determine where shippers choose to send their cargo.

He discussed some of the facts about the Port of Charleston, the ninth largest port in the US. South Carolina views the port as a major strategic asset. About one in ten jobs in SC are related to the port in some way, so its economic impact is enormous, which is why the state owns and operates it. The port grew almost 9% in FY2013 and 8% in FY2014, while the US port market has only grown 3-4% in those years. This reflects growth in population and manufacturing investment in the Southeast and, for the first time, that investment in heavily geared toward exporting. Record volumes are being achieved on a monthly basis. The port's major competitor is Savannah, GA which has led to rates being about 60% of what a port without a nearby competitor, like Norfolk, can charge. The top concern for Charleston is making the necessary investments to be able to keep up with this level of operating earnings. The Port of Charleston has been recovering from the recession but big investments are needed to handle large ships and to have modern automated terminals. The next 5 or 6 years will be the port's most challenging as they attempt to grow at a substantially faster rate than the market.

The Port of Charleston's plan for growing faster that the market includes capturing all of the cargo that is supposed to move over the port, attracting discretionary cargo, and growing the import business built with e-commerce in mind. Another key component is to be an intermodal rail-capable port with access to two competitive railroads that are enthused about serving the port. One of the big challenges in the shipping industry is that it is facing a shortage of trucks. South Carolina has built a rail-served in-land port adjacent to the BMW plant in Greer, SC, right in the middle of the I-85 Corridor. This hub is within 500 miles (the range for competitive overnight distribution) of about 100 million customers. One major challenge ports are facing is a shortage of truck drivers in America.

Federal channels in the Charleston Harbor are owned by the US government so the port is required to work with USACE to perform the deepening. Some of the confusion about harbor deepening comes from it being conflated with harbor maintenance. In Charleston, $14-15 million a year are spent to maintain its current authorized depth; deepening is a separate capital investment. The problem in the US today is that there is no money in the federal budget for harbor deepening, nor has there been a prioritization of deepening projects. Charleston's project is the first deep draft navigation project in what is known as smart planning, which is a USACE initiative to move projects along more efficiently. A Chief's Report will be issued in about a year that will begin the construction phase of the project. South Carolina state legislature, not knowing how much if any money the federal government will allocate to this project, has set

aside $300 million in an interest-bearing bank account for the project. Mr. Newsome believes that the deepening project can be completed by the end of the decade.

Four harbors have already been authorized for 50' mean level water (MLW) – New York, Baltimore, Norfolk, and Miami. Charleston is seeking 52', making it the only port to achieve 50' or more in the Southeast. A 52' MLW harbor could accommodate 8-10,000 TEU ships 24 hours a day without tidal restrictions and Charleston will probably be handling 13,000 TEU ships routinely as soon as the Bayonne Bridge is raised. The advantages of a port with this capacity are something that a shipping line cannot ignore.

Vice Chair Hanson remarked that one of the biggest developments for the port has been the support of the governor. He asked Mr. Newsome to elaborate on how that came about as well as their efforts working with the Southeast Governors' Alliance. Mr. Newsome responded that getting the whole state aligned concerning the strategic importance of the port has been the biggest accomplishment of the last 5 years and resulted in the state dedicating $300 million. He noted that there is no guaranteed federal expenditure for harbor deepening anywhere in the country.

Member Miller asked what the depth of the harbor is currently. Mr. Newsome answered 45' MLW, which means it can handle a ship at 48' of draft for two hours. This project's aim is to remove that tidal restriction for those ships. Chair Perkins asked if the port would still need the PORTS system if it was capable of handling these ships 24 hours a day. Captain John Cameron responded that PORTS will still be necessary for the bridge sensors and that a 50' depth will put the ships right at 10% under keel, which is what the Charleston Harbor Pilots try to maintain. If tidal fluctuations are greater than normal, the pilots will need to know that. Mr. Newsome added that the $300 million will cover at least the 60% state share for the 52' deepening and funds will need to be borrowed for other infrastructure investments. Whether the harbor will be deepened to 50' or 52' comes down to who pays for the extra two feet.

Vice Chair Hanson asked Mr. Newsome to comment on the expansion of the Suez Canal and how it will impact shipping. Mr. Newsome said that there is a great deal of competition between the Suez and the Panama Canals. Whichever offers the shortest haulage and thereby the lowest cost, will get the business. There is a pretty clear line of demarcation for which way shippers go based on point of departure.

Rear Admiral Glang thanked Mr. Newsome for his remarks and presented him with a recently completed chart of the Charleston Harbor.

United States Coast Guard (USCG) Sector Charleston

Captain Ric Rodriguez, USCG Captain of the Port Charleston

Captain Rodriguez discussed the role of USCG Sector Command. There are 35 Sectors, including Puerto Rico and Guam, whose responsibility is to manage USCG missions that fall within their area of responsibility. Primarily, this means Captain of the Port responsibilities and search and rescue. Working with USACE, NOAA, and other federal and state/local agencies, USCG is going to be prepared to address the concerns over handling the anticipated growth of

the Charleston Harbor. As Sector Commander, Captain Rodriguez is not concerned about the maritime transportation impacts. His office is adequately staffed to meet the challenges that he expects and does not plan to expand it further. Captain Rodriguez would not be able to perform his job in regards to hurricane/heavy weather or climate change preparedness without NOAA's tools and data. These tools are relied on to make an appropriate assessment to minimize the impacts of heavy weather events on the maritime transportation system. USCG will work hand-in-hand with the pilots to address the increased workload and will rely on NOAA's continued support with mapping surveys to provide the most accurate data to the maritime community. At this point USCG Sector Charleston has been very satisfied with the data and products that NOAA provides, but would like to see the potential of apps explored more fully. Private and commercial mariners are quite savvy and they want technology at a high level of granularity to be able to navigate safely. USCG welcomes continued collaboration with NOAA and other partners and open, honest communication about what is not working is essential.

RDML Glang asked Capt. Rodriguez to speak about how useful NOAA's products and data are for AIWW users. Capt. Rodriguez said that the biggest concern on the inland waterways in his area of responsibility is shoaling. The charts are accurate but there are extreme fluctuations of tide. Shoaling has increased making the AIWW a very difficult place to navigate. Maintaining the AIWW has been the responsibility of USACE and other agencies. The Coast Guard is looking for a way to get states and even the private sector to take on some of that responsibility.

Member Armstrong asked if USCG Charleston is using any virtual aids and how virtual aids will impact navigation in his area. Capt. Rodriguez is not aware of any being used currently but would be interested in exploring what benefits they may offer.

Chair Perkins asked Capt. Rodriguez to discuss his thoughts on the tri-agency listening sessions that were held across the country. Capt. Rodriguez was not able to attend the sessions but his staff reported back that they found them to be very insightful. They validated what USCG Charleston has been doing and he was not aware of any major concerns that came up during the sessions. He felt that they were a very beneficial use of federal money. Ms. Medley added that concerns and responses from the country-wide listening sessions were posted on the website and she has written a NOAA perspective report as well. Member Kelly added that local representative at the listening session he attended were uninformed on key components of the program.

Member Miller asked to what extent USCG Charleston utilized the PORTS system. Kyle Ward answered that Charleston's PORTS consists of NWLON gauges and air gap sensors, but is very limited in use. Capt. Cameron added that the sensor is very important as it provides a 2' safety margin.

Member Kudrna asked if USCG transmits information from recreational boaters to NOAA regarding elevation errors. Capt. Rodriguez responded that he does not believe they do and acknowledged that it may be a significant gap that needs to be rectified.

Member Miller asked to what extent the AIWW is maintained by NOAA versus USACE. Capt. Rodriguez answered that it is almost exclusively USACE's responsibility. Lt Col. Litz added that USACE does the dredging but that for the last several years, the money has not been available even for regular maintenance.

RDML Glang commented that improved nautical technologies lead to changes in recreational boater behavior. He asked if Captain Rodriguez is finding that recreational boaters expect to be able to use their phones for navigation and emergencies. Capt. Rodriguez responded that, yes, this is the case and notice has been issued that boaters need a marine band radio and navigational charts. This guidance is frequently not heeded, but Captain Rodriguez stresses it at every opportunity he has, such as during National Safe Boating Week.

United States Army Corps of Engineers (USACE) Charleston District

Lt Col. John T. Litz, Commander and District Engineer, USACE Charleston District

Lt Col. Litz gave a brief overview of USACE's work in the Charleston District and how they interact with NOAA, which he feels to be a great federal partner. USACE has a long history of development in Charleston and their projects include Fort Sumter, Fort Jackson, Charleston Airfield, and the jetties that were built in the late 1800's. USACE Charleston District has 256 personnel, two of whom are active Army and the rest civilians. USACE Charleston is primarily project-funded, meaning they take a fee-for-service and the workload from federal partners determines the size of their personnel and what capabilities they carry. Other USACE Districts can be leveraged to provide additional capabilities.

The Charleston District's Civil Works mission area is the one most closely aligned with NOAA's work, but the regulatory and emergency management programs also interface with the agency. The Civil Works' Navigation and Survey mission has an annual budget of $15-20 million, mostly spent on harbor maintenance. The IAWW is an authorized project but has very little funding. Civil Works produces plans and specifications for dredging, ditching and diking, and dredge material disposal areas.

USACE's flagship vessel in Charleston is the Evans, but they also have a smaller vessel called the Wilson. These multibeam vessels survey all the federal channels in South Carolina. An ATV equipped with a topographic LiDAR retrofit system is run along the coasts pre- and post-storm to assess how much material has been washed away. USACE provides federal partners with channel condition data and map products via E-Hydro and informs the public through its website. USACE has modernized its web products and would greatly appreciate any user feedback.

USACE Charleston's Engineering Division is one of the subordinate divisions within the district and has a broad range of projects including beach shore erosion and protection. Coastal studies are being conducted to find sand sources and study the impacts of their projects on adjacent shorelines. The Charleston District is also looking into beneficial uses of dredge material.

USACE Charleston provides the surveying capability for its emergency management mission, but they have realized that NOAA capabilities will probably be first on scene to provide channel surveys after a storm. NOAA's tide gauge measurements are used daily by USACE Charleston survey crews, as well as benchmarks and vertical datum.

Lt Col. Litz discussed the Charleston Harbor deepening project which is currently in the feasibility stage. The Corps is undergoing a Civil Works transformation, looking at more efficient ways of conducting feasibility studies by utilizing better science. The Post-45 project is the first to go through this new process which will reduce timelines by 3-4 years and save about

$8 million. There are other benefits that are not currently being studied; the focus has been primarily on reducing transportation inefficiencies. USACE Charleston is very close to releasing a draft feasibility study and environmental impact statement to let the public know what depth the Corps will pursue on their way to the final feasibility study and EIS. After the Chief's report is complete, there is a pre-construction engineering and design phase where the details will be more fully explored. The cooperation of all of the partners involved in this project has set an example for future Corps undertakings.

Member Armstrong asked if USACE is delivering survey data from their channel surveys and what the timeframe is for delivery. Lt Col. Litz responded that the information is available on their public website and Mr. Wolf added that the data is typically uploaded within a week.

Member Armstrong asked what technology USACE Charleston uses for off-shore surveys. Lt Col. Litz answered that they use the Evans vessel which is equipped with multibeam technology.

Member Armstrong asked if USACE Charleston interacts with the Bureau of Ocean Energy Management (BOEM) regarding its sand resources project. Lt Col. Litz replied that they do and Mr. Phil Wolf added that any project that goes 3 miles or more off-shore, the Corps is required to coordinate with BOEM.

Member Armstrong asked if USACE Charleston has had any discussion with NOAA about the possibility of augmenting NOAA survey teams with USACE personnel after storms. Kyle Ward answered that a port like Charleston's would want all available assets on-hand to get the port functioning again after a storm.

Chair Perkins asked if a mechanism is in place that USACE could use to reach out to the Office of Coast Survey for hydrographic survey support from NOAA or if contracts are in place to get private sector support during maintenance or repair of their vessels. Lt Col. Litz responded that IDIQ contracts are in place to remove debris or a vessel from the harbor. Chair Perkins asked if a mechanism exists between NOAA and the Corps allowing access to the hydrographic survey contracts that have not received sufficient funding to be fully utilized. Lt Col. Litz did not have the answer but would research the question. RDML Glang noted that there is no MOU between NOAA and USACE that allows for the effective transfer of money. Chair Perkins suggested that the Panel consider this issue further since a contract may be useful for both parties.

Member Kudrna asked if USACE has to wait for a WRDA after the harbor deepening feasibility study is complete. Lt Col. Litz answered that a WRDA would be required to authorize the project.

Capt. John Cameron commented that his experiences with USACE Charleston's services have been excellent.

RDML Glang asked what he should tell recreational boaters that complain that the IAWW is not at project depth and is shoaling. Lt Col. Litz responded that the answer is not satisfying but suggested that they write their Congressman about appropriation. All of the contracts are in place to do dredging; there is just no funding to get it done. Congressional action will is required to change this.

Member Kelly asked about the plan for dredge material disposal or constructive use and what is being done with normal maintenance dredge material. Lt. Col Litz said that normal maintenance dredge material goes into an array of disposal sites and ocean disposal is an option but has many associated costs. Brian Williams added that the draft report will not contain any plans for an official use of dredge material but they have received public comment on the issue and met with state and local agencies to discuss their preferences. A detailed plan will be developed during pre-construction engineering and design phase.

Vice Chair Hanson suggested that the HRSP get briefed on BOEM's projects along the east coast. He also discussed his company's experiences with a previous deepening of the Charleston Harbor where an agreement was reached with the Corps to use the dredged sand to raise the Wando Terminal but an agreement with MMS could not be reached to use the sand. He added his appreciation for Lt Col. Litz' service in Kosovo, Afghanistan, and Iraq.

Luncheon Speaker

Dr. Leslie Sautter, Geology Professor, Ocean Mapping & Marine Geology Department, College of Charleston

Dr. Sauter discussed the Bnthic Acoustic Mapping and Survey (BEAMS) program she runs at the College of Charleston (CoC). The program evolved through a relationship with CARIS, the primary software vendor for NOAA survey vessels, and officially began in 2007 when NOAA provided ship time on their Nancy Foster vessel. CoC and the University of Washington (UW) are the only institutions in the country, if not the world, offering this kind of program. The students are geologists, oceanographers, and sometimes marine biologists, that have been trained as scientists first and are learning how to map. Research is expected of students and the goal of the program is to get every student on a dedicated cruise as well as participate in internships or volunteer opportunities onboard vessels. Students have volunteered as survey techs on vessels, which is a tremendous learning experience and also very valuable to the investigators. Three courses provide the foundation of the training in addition to being a geology major, preferably marine geology. The program encourages coursework on GIS, geophysics, and any other special topics that the college can provide. Software vendors come in annually to provide free training on different software packages.

The program mines the existing datasets for its courses from sources like National Geophysical Data Center. From this information, the students design scientific questions and create posters to present at local and professional meetings. BEAMS has presented 64 posters at national and international meetings over the past few years, winning several awards and almost every student has presented. Research cruises are the cornerstone of the program. Students undergo the entire process of data acquisition, handling ancillary data, deployment of other instruments, and processing the data. The program trains and conducts active research on many kinds of deployments that contribute to a better understanding of the character of the sea floor. The program has never received grant support for its work, but it wouldn't be able to function without their generous partners. Time on smaller vessels has been donated to the program so that they can conduct shallow water research, providing assistance to local groups like the Coast Guard and USACE Charleston. BEAMS hopes to grow its internship opportunities as it is a great recruitment pool for employers looking to fill positions. Practically any graduate of the

program that wants to go into this field can get a job within a few months of graduating. Contractors regularly call seeking students and 11 graduates are now full-time NOAA employees. Many have gone into oil and gas with private firms, software companies, or have started their own businesses. Only 12 have gone into graduate programs using these skills because the job opportunities are so good.

The students have conducted a large variety of research projects and have collaborated with many groups to assist in the analysis of their data. One example is the South Carolina Department of Natural Resources, which identifies critical fish habitats and the BEAMS program goes out and maps them. This is one of several collaborations. The program has their compiled work with other partners to establish paleo-shorelines for the study of sea level changes.

Dr. Sautter hopes to develop a BEAMS certificate for undergraduate students. There is a need to develop more courses and increase staff, so funds are being requested for the next few fiscal years. The program would also like to acquire its own multibeam and get annual ship time into the budget. BEAMS is looking at the potential of crowdsourcing data to process in-house at CoC.

Member Jeffress asked if the software courses were taught by CARIS and how they manage two-credit courses over a semester. Dr. Sautter responded that she does the CARIS training over a half-semester, CARIS does a three-day workshop designed specifically for this program, and she continues the training along with the help of a graduate student. She added that the course could be made into a three credit course, but they have the flexibility to do it as a two credit.

Chair Perkins asked Dr. Sautter how she manages the push in academia of not teaching to a specific licensed software package. Dr. Sautter said that her program started with CARIS, who provided them with 15 free licenses. It is a priority that these students are familiar with this particular software because of the program's strong association with NOAA whose vessels utilize HIPS software. Students are encouraged to attend workshops from other providers, such as Fledermaus or EIVA.

Chair Perkins asked Dr. Sautter if she expected to see bathymetric LiDAR added to the curriculum now that NOAA is contracting for it. Dr. Sautter responded that she would like to see a variety of short courses developed where experts, especially returning alumni, teach students with the required background training on dedicated subjects like bathymetric LiDAR.

HSRP Panel Discussion

Scott Perkins, HSRP Chair

PowerPoints from the USACE Listening Sessions were distributed to the Panel. The "raw" form of the information was also available if anyone was interested. Member Fields felt that people would be interested to see some of the user groups that responded, the largest responding groups being recreational boaters. Ms. Medley suggested that it might be that they felt more compelled to respond because they had smaller turnout at the sessions compared to industry representatives. Ms. Medley added that it is a feedback forum, not a survey. Member Fields thought that it should be clearer that the response back should not be taken as a "balanced response" from all users. Ms. Medley acknowledged that the response appears to be weighted towards the recreational community, but if you look at the Coast Survey User Pyramid, recreational users make up the

largest percentage of users. Chair Perkins suggested arranging a WebX meeting for HSRP members with any questions about the Listening Sessions, specifically what NOAA Nav Services has been doing to address some of the issues that were raised.

RDML Glang updated the Panel on new member selection in the wake of Steve Carmel's resignation. The public announcement for new members was published in the Federal Register, is open until October 10. NOS has employed their extensive mailing list of user groups to find candidates that cover the different topics of interest, and have targeted certain folks who they think have particular backgrounds that they're looking to fill on the Panel. If Panel members have suggestions for someone who should be considered, they should send them and us an email. Member Kudrna suggested considering the Scientific Advisory Board's practice of using outside membership in working committees as an introduction to the FACA and calling-up certain members.

Dr. Callender discussed the Presidential Innovation Fellowship. The NOAA CIO has agreed to pay for a Fellow. RA Glang said that the two Fellows are not technically on board yet, so he was unable to comment on who they are. NOAA is looking to engage the private sector to come up with innovations on how they can better deliver the big data that NOAA acquires. One idea within NOAA was to look at smarter ways of delivering coastal intelligence to the marine transportation sector.

Chair Perkins sought comments on the day's remarks, sessions, and work towards establishing the pathway to a productive report-out. Vice Chair Hanson said that, when it comes to partnerships, he would like to see more engagement from the academic community, especially those with active lobbying groups in Washington. They have been very organized and effective in advocating for research. Member Jeffress commented that partnerships have declined since earmarks are no longer legal. Member Miller shared her experiences working on a NOAA program through a university - the program had very valuable information that the Navy wanted to pay $750,000 to expedite, but NOAA did not have a mechanism in place for that partnership, and the program nearly had to turn down the contract. Not being able to move money between federal agencies (much less smaller organizations) is a major stumbling block for partnerships. Member Barbor suggested that a co-operative institute is the easiest way to get money flowing very quickly.

Vice Chair Hanson commented that one of the big things to come out of WRDA was that, for the first time, USACE was able to accept non-federal funds. He asked if NOAA had the same issue and added that major philanthropy foundations have been very active after Hurricane Sandy and in areas around the Gulf of Mexico. He asked if this is a market NOAA has looked into as a potential source of funding. Dr. Callender replied they have tried to do that in the few areas where it is allowed, but it involved legislation. Some of the projects they have attempted to use philanthropy funding for have not worked, though he was not clear on the details. A few organizations have used foundations to do things in partnerships with the agency. The IOOS Association, Sanctuaries, NERRS (National Estuarine Research Reserve System) may be mechanisms worth exploring. RDML Glang said that NOAA has several MOUs and MOAs with USCG and agreements with NGA, and statutory mechanisms for accepting money for the navigation programs (the Coast and Geodetic Survey Act of 1948).

Member Shingledecker asked if there may be barriers to establishing prescripted mission assignments for emergency response capability that the HSRP could assist with. Mr. Bradley replied that the response from FEMA's lawyers has been, "If you already have the authority to do the work you are requesting a mission assignment for, then you don't need a mission assignment." NOAA has pushed back and it has become an issue for the leadership of the two agencies.

Member Miller said that it would make sense for users like USACE, EPA, USCG to contribute to systems such as PORTS, because they are federal users. Mr. Bradley believed that it would be a useful recommendation to NOAA to work through any available channels to streamline those mechanisms, not so much for the money but for the outcomes.

Member Kudrna suggested that representatives from the IOOS Regional Association and local Sea Grant programs should be invited to future HSRP meetings to hear what is being discussed and provide input. He added that it may be useful to assemble a working group that addresses port development expansion and put it into a perspective that could be understood by the Department of Commerce (i.e., what the US is not doing compared to other countries in terms of capital and infrastructure investment).

Vice Chair Hanson suggested the Panel be briefed by ASCE and US Port Authorities, who have done a lot of work assessing the value of ports. For infrastructure, it is not a matter of federal, state, or private funding but just the fact that it has to get done, which puts the discussion on a different plane.

Chair Perkins noted that US Hydro's next meeting will be coming up and planning the future meetings together could be an opportunity for cross-pollination. The plan is to hold the next Panel meeting in LA/Long Beach, but HSRP could attend the US Hydro Conference on their own dime and have a short Panel discussion afterwards meant to inform the next full HSRP meeting. Members were asked to look into meetings or conferences around Southern California around February 2015. RDML Glang noted that 6 new members will be onboarding and scheduling a meeting too early in the year may be a challenge to get them seated. Mid to late February would be the earliest for those new members. Having the HSRP Chair or Vice Chair represent the Panel at meetings was proposed, particularly for meetings in Washington, DC.

Member Kelley suggested that the Panel should spend some time refining who their partners might be and find an offline way of developing that relationship rather than putting them on the spot at a FACA meeting. The HSRP needs to be clear on what it wants partners to do, then they can figure out which partnerships will be most beneficial.

Mr. Dasler looked to the HSRP to bring forward ideas on how NOAA data could be better utilized. He mentioned higher-resolution data and some of the partners that may be interested (e.g., Google Earth, Esri).

Chris Freeman, Geodynamics Group, responded to the Panel's question "Are there better ways to meet stakeholder needs?" by saying that there could be a better way to let all stakeholders know of existing data to potentially reduce effort or increase knowledge of a particular area. He mentioned SeaSketch as a good platform for keeping NOAA and USACE informed on data inventory.

Adjournment

The meeting was adjourned at 2:37 p.m.

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Wednesday, September 17, 2014

The meeting was called to order at 8:07 a.m.

Chair Perkins welcomed everyone to day two of the meeting and briefly reviewed the previous day's sessions and tour of Charleston's Wando Terminal.

PORT & HARBOR EXPANSION SPEAKER PANEL

***Charleston Port Expansion, Future Growth & Economic Impacts* - Byron Miller, Vice President, Marketing and Sales Support, South Carolina Ports Authority (SCPA)**

Mr. Miller discussed the ongoing activities at South Carolina's ports and their economic impact that extends well beyond the state. SCPA operates five marine terminals in the Port of Charleston, there are also private terminals over which they have no jurisdiction. Most of SCPA's focus is on the container trade which has been their fastest growing sector. The port will export about 200,000 US-made BMWs this year. The Port of Charleston is growing at more than double the pace of US trade growth, which is largely related to market share gains the port has earned but also because the Southeast has become a very attractive place for manufacturing and distribution.

Vessel size is the biggest issue facing global trade today. The most important consideration is the pace of growth over the past 3 or 4 years. By 2016, 59% of the world's shipping cargo will be on ships too big for the current size of the Panama Canal. Mediterranean Shipping Company (MSC) has estimated that an average vessel burns about 200-220 tons of bunker fuel a day while sailing. With the cost of bunker fuel at $600-700 a ton that amounts to $125,000 of fuel a day per container ship. Fuel savings for 1,500+ TEU ships are about 30-40% per unit, saving $40-50,000 a day per vessel. MSC has over 500 vessels in its fleet. The economics of scrapping older, smaller vessels is quite compelling and shipping companies are not waiting for the expansion of the Panama Canal. An average of seven post-Panamax ships come into Charleston Harbor every week and they will be arriving with increasing frequency once the expansion is complete. About $2 billion dollars are being put into port facilities, a large part of which will be for the harbor deepening project. The new terminal project at the former Navy base is expected to complete Phase 1 in 2019, adding about 15% capacity to container handling at the Port of Charleston.

***Overview of Post-45 "Harbor Expansion" Project* – Brian Williams, Chief of Programs, USACE**

Mr. Williams provided the Panel with an overview of Charleston Harbor deepening project. There is a misconception that the federal channel is the entire area of the harbor, but only 17% of the bank-to-bank area within the footprint of the federal project is channel, if you subtract the Ashley River, it is only11%. Federal objective for water and related land resources is to identify the National Economic Development Plan and ensure that plan is consistent with protecting natural resources.

Currently, Charleston Harbor has restrictive channel widths that prohibit two-way traffic in some areas and the turning basins are too small to handle the vessels that will be calling Charleston in the future. By making the proposed modifications, the future projected cargo can be brought in on fewer vessels, resulting in cost savings, improved navigational safety, and lessened environmental impact. Part of USACE's Civil Works Transformation smart planning was to study ranges of depth from 46' to 52' in one-foot increments. Three different alternatives were proposed for Charleston's terminals which will be publish in the draft report coming out in a couple weeks. An interagency coordination team was in constant contact providing ideas and feedback on USACE's process. The Civil Works Transformation came about because the USACE process was taking far too long and costing too much. The initiative focuses on risk-based decision-making processes and reducing inefficient components that have previously been part of the studies. Extensive partnerships with federal, state and local organizations have been utilized throughout the project. USGS has collected information on salinity, currents, and water levels at prescribed locations that have been input to EPA's environmental fluid dynamics code model for parameters with which we could evaluate project alternatives. Joint Airborne LiDAR Bathymetry Technical Center of Expertise (JALBTCX) assisted with LiDAR and light reflectivity surveys on plant communities in the area. Coastal Carolina University assisted with magnetometer and side-scan sonar surveys.

The next steps for the project are to incorporate, compile, and review all of the comments that have been received and make any necessary adjustments. The Final Report is expected in the Spring, followed by the Chief's Report and final recommendation in Fall 2015.

E-Hydro Local Perspective

Justin West, Cartographic Technician, USACE

Mr. West provided the Panel with a local overview of the software USACE has been using to create channel condition reports and products, called E-Hydro. E-Hydro is a USACE headquarters-level initiative to create a repeatable and standardized process for creating chart products, channel condition reports (CCR), and several analysis products used internally to quantify material at the bottom of channels. The software reduces the possibility of human error analyzing reports and reduces production times significantly and allows users to reconfigure

parameters as needed. E-Hydro produces several products, some for distribution. Channel availability reports generate a value for each channel that has been run through the process and reports out historic data on shoaling and other criteria. CCRs are limited because they are not a geographic product, they can only report that there is a shallow point of a certain depth somewhere within a specified reach. Mariners need to be advised that CCRs are not the end-all-be-all. Chart products are standardized on the E-Hydro output level and each project area has an individualized template that contains all of the collected data. The data can be output in ArcGIS or pdf format. USACE is moving towards an enterprise solution for data delivery and is creating a data warehouse that merges all of the local E-Hydro data so that it can be queried as needed and distributed to customers. This is still in the testing phase and developers are having some issues with it.

***Navigation Update from the Charleston Branch Pilots* – Captain John E. Cameron, Executive Director, Charleston Branch Pilots Association**

Capt. Cameron discussed the navigational challenges of the Port of Charleston, focusing in particular on post-Panamax vessels. The largest dimensional change to the Panama Canal will be widening it by 55%. 28% of the ships that came to the Port of Charleston last year were post-Panamax; once the Bayonne Bridge is raised, 13,000 TEU ships will be coming into Charleston all day long. The harbor will have to be much wider to accommodate turning radii and two-way traffic. In 2004, Charleston got the width it will need while other channel projects around the country are focusing on depth and not paying enough attention to width. Traffic flow for those channels will be a challenge.

There are two different channels: one inside the harbor where ships move slower, with no currents, and waves hitting the ship head on, and one channel outside the harbor where the currents are lateral, there are ocean waves, and more speed is required to manage a crab angle. As a ship moves through a channel, the water underneath sucks it to the bottom and you get to a point where the ship just won't go fast enough to maintain control. If a post-Panamax vessel heels 2 degrees, it adds a meter to its draft on the low side. The USACE Design Manual allows 10% of the vessel's draft as under keel clearance in a harbor and 20% off-shore. The last couple generations of off-shore channels have been two feet deeper in the ocean than the harbor, but that's not enough anymore and needs to be reevaluated. The cargo value of sinking a 13,000 TEU ship another foot into the water is $15 million. The day after 5 feet are dredged from the harbor, the first ship that comes in will be carrying $75 million more cargo in and another $75 million more on the way out. Right now, turning basins restrict Charleston Harbor to 13,000 TEU ships.

Other updates include asking the Coast Guard to shorten reference point intervals because when a big ship is turning, 2 and a half seconds is too long between flashes. It has taken seven years to reconfigure charts to cover another seven miles out of the channels. Capt. Cameron displayed differences between predicted depths and actual depths reported by the PORTS system. In some

cases there was a difference of 9 inches, which is especially critical when passing under the Don Holt Bridge. What these measurements don't account for is salinity and, in salt water body like Charleston Harbor, a ship that floats at 47 and a half feet will float at 48 and a half feet in a fresh water harbor. Salinity can changes with storms and the port does not have a good means of assessing it.

The biggest navigational challenge for the Port of Charleston is NMFS's regulation to slow vessels to 10 knots along the Atlantic Coast for up to 6 months at a time to protect right whales. 10 knots is too slow in the entrance channel to manage a crab angle and maintain control of the vessel. NMFS put a deviation clause in that allows for vessels severely restricted by hydrographic, oceanographic, or atmospheric conditions. USACE Charleston has done a study of the Charleston Channel in typical weather conditions and they found that if a vessel slows down from 15 to 10 knots, the dimensional margin of safety on either side of the vessel is reduced by 50%. Another study looked at the effects of decreasing speeds on navigational precision. From 20 to 10 knots, a vessel loses 20% of its navigational precision per 5 knot increment. For 6 months of the year we're working too close to the margins. Captain Cameron discussed an incident that happened in 2004 with a ship stalling in the harbor. This year, NOAA has accepted a petition from the American Pilots Association to exempt only the dredged channels from the right whale speed rule. With the larger ships coming, it is a big issue now. Capt. Cameron presented a chart of right whale sightings to demonstrate some of the problems of the regulations. NMFS has not run any navigational studies on the impact of this rule. The petition is expected to be denied by NOAA and the Office of Management and Budget's Office of Information and Regulatory Affairs (OIRA) has agreed to get involved given of the safety risks of the regulation.

HSRP Q&A with Speaker Panel

Chair Perkins asked Capt. Cameron if he has given the Coast Guard's NAVSAC (Navigation Safety Advisory Committee) a presentation about this issue. Capt. Cameron said no, but he would be delighted to do so. The Coast Guard has been providing NOAA AAS data to electronically enforce the regulations, but has not wanted to be involved in the matter. Chair Perkins will look into when USCG's next NAVSAC meeting is and try to facilitate Capt. Cameron giving them a presentation.

Chair Perkins asked Mr. West if the E-Hydro tool is licensed intellectual property. Mr. West answered that it is USACE developed, but did not have an answer concerning its licensing. Chair Perkins was curious if other agencies or the public can utilize the tool. Mr. West will ask the developers and get back to the Panel. Chair Perkins asked why USACE was not distributing the spatial data for the CCRs. Mr. West responded that the CCRs are meant to be used in conjunction with USACE charts that would show the soundings. The Chair asked if you can export the SAC with an xml for use in Google Earth or public domain viewer. Mr. West said that exporting with the E-Hydro software is an option, but not something that has been explored

sufficiently. E-Hydro was developed using Python script, which is integral to the Esri ArcGIS platform and does require a CAD input or a geo-database that is created in the Esri GIS format.

Member Kudrna asked what the cost sharing would be for the deepening project under the current USACE for federal participation. Mr. Williams answered that there were some adjustments in the WRDA in regards to cost sharing as depth changes. The draft report will include language on the project's cost share but he was unable to provide a full answer until implementation guidance has been issued. Mr. Miller added that 95% of America's maritime commerce occurs in 12 states and those states are paying 50-60% of the cost of deepening to serve the rest of the country.

Member Miller asked what the primary environmental concerns are for the project and how much pushback they are expecting from the public sector. Mr. Williams responded that there has been a public scoping session, per NEPA, and about 100 comments were received. Many of those comments focused on salinity intrusion into the harbor and what impact that would have on groundwater. Other concerns included shoreline erosion. The draft report will address those concerns and the steps taken to mitigate them. It would be premature to guess about opposition to the project, but press and the general response to the project have been positive. Mr. Miller added that, because 11% of the harbor is channel, the project is not as significant in scope as many other deepening projects that have not produce any significant environmental impacts.

Capt. Brennan asked what kind of format would be useful in displaying salinity to mariners. Capt. Cameron answered that he was unaware of the status of the technology to provide salinity measurements but that having them would be helpful to incorporate into calculations in the upper harbor as boats pass under the Don Holt Bridge.

Vice Chair Hanson asked who pays for PORTS in Charleston. Capt. Cameron said that SCPA paid for the Don Holt Bridge sensor and another is needed on the Ravenel Bridge. The NWLON gauges are funded by NOAA but the port pays an emergency fee if the system should go down and need repair. SCPA has also paid for laser surveys of the bridges.

Vice Chair Hanson asked if salinity factors in to the Corps' modeling in terms of drafts and economic benefits. Mr. Williams was unsure but would ask the USACE economist familiar with their modeling suite, HarborSym. Vice Chair Hanson added that it is a physical issue. Ports around the country with saltwater intrusion are building barriers as part of the channel design. USACE's hydrodynamic modeling does take salinity into account.

Vice Chair Hanson inquired about estimating only 5% of the project cost to be dedicated to environmental mitigation when Savannah required 60% for mitigation. Mr. Williams said that the details can be shared when the draft mitigation plan comes out.

Member Jeffress commented that his institute has been measuring salinity in Oasis Bay since 1991 for the City of Corpus Christi which regulates freshwater inflow into the bay. The sensors

that they use are not that expensive but they have to be calibrated very frequently. Member Edwing added that CO-OPS does provide salinity testing through PORTS but agreed that it is labor intensive. Member Edwing asked if there are other environmental parameters that would be helpful for navigating Charleston Harbor. Capt. Cameron said that if there was some way of predicting the ever-changing currents, particularly at the confluence of two rivers, it would be beneficial. The wind-driven effect on tide is something of a wild card in the harbor.

Member Armstrong mentioned the Whale Alert software package that may help relieve speed restrictions if no whales are detected within a specified radius. Capt. Cameron said that he would like for such a system to be considered. He added that there have been no right whale fatalities due to ship strikes off the coast of South Carolina since being listed as endangered in 1970.

ATLANTIC INTRACOASTAL WATERWAY & RECREATIONAL BOATING SPEAKER PANEL

Atlantic Intracoastal Waterway Overview – David Warren, PE/PMP, Project Manager, Civil Works, USACE

Before beginning his discussion, Mr. Warren informed the Panel that there are salinity gauges for the Cooper River managing the saltwater/freshwater interface. He then discussed his area of responsibility - the Charleston and Georgetown harbors and South Carolina's portion of the AIWW. Charleston Harbor does the best job on the East Coast of keeping vessels moving in and out their terminals by working hand-in-hand with pilots. On the AIWW, the Corps works with towing and dredging communities to get input. South Carolina has 235 miles of AIWW divided into three regions. All of the inlets along the AIWW are Corps maintained. At low tide around Charleston lately, there have been sandbars across the channel. This results in tide restricting their clients – the dredging and towing industries and the USCG. During the ARRA era, there was a lot of successful dredging work being done in the AIWW, but funding went to nothing in FY2014 and $500,000 for FY2015. USACE is working with local governments and the State of South Carolina to prepare shovel-ready projects in hopes of securing a contributive funds agreement. As long as the commercial tonnage remains as low as it is, no money is expected be appropriated for the AIWW.

Sullivan's Island and McClellanville are particularly problematic areas of the AIWW, with incidents including injuries of recreational users hitting sandbars at mid-tides. The Ashepoo-Coosaw cutoff has been experiencing problems with the banks sloughing off into the channel. South Carolina's AIWW is an important part of the industry and lack of dredge funding is impacting economics up and down the AIWW. $14 million is how much he would request, followed by $5-6 million a year for maintenance.

Commercial & Recreational Intracoastal Waterway Interests – Brad Pickel, Executive Director, Atlantic Intracoastal Waterway Association

Mr. Pickel discussed the AIWWA's advocacy efforts to secure federal funding to maintain what they consider to be a vital marine highway, connecting all of the ports from Norfolk down to the Florida Keys. He highlighted the critical shoaling areas along the AIWW.

The majority of AIWW users are recreational but there are commercial shippers up and down the AIWW that deliver a variety of products, including equipment that is too heavy to be shipped by truck. Charleston County Council voted to approve submitting $500,000 over the next two years for waterway maintenance. Approximately 12,000 people come to Charleston during the winter months spending about $300 a day to use the waterway, which leads to a lot of economic support for small communities. It is also a strategic corridor for national defense. Jet fuel is sent along the AIWW to Beaufort Air Station where F-35B trainings are being conducted. The Coast Guard and ATF also use it for national security purposes. A study by the State of Florida demonstrated that the AIWW has an $11.86 billion impact on the state and contributes to 66,000 jobs. If they were able to maintain it at the authorized widths and depths, it would mean another $1.5 billion for the state and 8,000 related jobs. The impact of an area's economic resilience should be a focus for discussions on the AIWW.

The AIWWA pursues additional funding for the marine highway and also looks at a maintenance needs assessment. Funding for the entire AIWW in the FY2015 President's budget has almost doubled from the proposed FY2014 funding level. A section of WRDA includes a requirement for Corps districts to submit operation and maintenance needs of the AIWW to Congress. The AIWWA works with the Governors' South Atlantic Alliance, which is four states working together to identify regional issues that they can collaborate on. GSAA supported AIWWA in producing a report identifying the critical shoaling areas of the AIWW. North Carolina and Florida have state funding sources to augment federal funds which allow them to do more dredging than the other states.

Three areas where HSRP could be of assistance to AIWWA:

- Encourage NOAA to increase resolution in critical shoaling areas, especially in GA and SC;
- Identify the Magenta Line as a reference line and not to be followed exactly;
- Assistance in identifying opportunities for crowdsourcing.

***Intracoastal Waterway Navigation Issues* – Larry Dorminy, Senior Editor, Salty Southeast Cruisers' Net**

Mr. Dorminy took a moment to show his appreciation on behalf of the SSCN staff for the hundreds of condolences that were received on the passing of Claiborne Young earlier in the year. He also announced that Cruisers' Net has been purchased by the team that had been running it with Mr. Young, as of this week it is official and back up online. Cruisers' Net has identified 18 problem stretches in the AIWW where shoaling is continually reported. Cruisers' Net relies on crowdsourced information and once shoaling is confirmed they issue navigation

alerts. SSCN is asking NOAA to consider how alternate routes should be marked for recreational boaters. Mr. Dorminy discussed Umbrella Cut near St. Andrew Sound as an alternate route to following the Magenta Line which would take the boater out into the ocean. He asked: What should NOAA's role be in determining optimal routes? Finally, he discussed how SSCN's software works and that it is designed for absolute novices attempting to navigate the ever-changing AIWW.

Chair Perkins said he hopes the breakout sessions will address these kinds of issues in depth.

***New Coastal & Estuarine Surveying for Recreational Boating Safety and Coastal Resource Management* – Dr. Clark Alexander, Jr., Professor, Skidaway Institute of Oceanography**

Dr. Alexander's discussion centered on Georgia and the mapping work he has been involved with in the AIWW and near-shore waters. Two years ago, Skidaway Institute of Oceanography purchased an interferometric side-scan sonar system which allows for shallow water bathymetry in Wassaw Sound and Georgia's five rivers. The data is processed using HYPACK. Much of the available bathymetry for the Southeastern estuaries is quite old, much of it the results from 1933 lead line soundings. Funding came through a Coastal Zone Management program to develop a new bathymetric model for Wassaw Sound. In areas that were too shallow, LiDAR was used at low tide, or a single beam echosounder. These tools have allowed users to see both fine-scale features and large figures associated with the confluence of channels. Dr. Alexander has been collecting sediment samples to create grain-size maps for characterizing the floors and has worked with Georgia DNR Fisheries Division to put the information in useable formats. The surveys took much longer than anticipated because of issues related to heat, pitch and roll of smaller vessels. Dr. Alexander is working with NOAA to compare the new river data to the old data.

Skidaway has mapped a salt marsh to develop a DEM that can be used with circulation models. They have also mapped erosion/accretion rates and patterns in Georgia's AIWW. They will be extending this work into the rivers this year. The AIWW is eroding on both sides partially as a result of increased recreational boating activity. Looking at the loss of marsh from a management standpoint is something that needs to be considered. The Georgia Coastal Hazards Portal contains all the erosion rate data for Georgia's barrier islands. The Southeastern Governors' Alliance has been developing tools to address coastal vulnerability to storms, but the tool is something that can be put to use with other NOAA data to assess coastal hazards and vulnerability from a variety of factors.

Chief Miller, Coast Guard Station Charleston, commented on the importance of minimizing shoaling from the response perspective. He discussed an instance of a search and rescue cases in the AIWW where he had to stop because he didn't have enough water.

HSRP Q&A with Speaker Panel

Member Shingledecker emphasized how vital it is to better maintain the Magenta Line. Novice users are running aground or are venturing out into the open ocean. She asked to hear more on the Argus system and how the community is using it and what their response to its data has been. Mr. Dorminy said the equipment is being put onto private boats and the information is uploaded for whoever wants to use it. Mr. Hersey added that there are about ten units out doing north and south surveys as wells as some local transits. He feels that crowdsourcing the bathymetry data would be useful in addressing the Magenta Line issue.

Chair Perkins asked if the lack of dredge funding for the IAWW has been brought to the attention of the Marine Transportation System FACA. Mr. Pickel said he has not but would like to do so.

Member Miller asked for more information on the current status of charts in the AIWW. RDML Glang responded that about a year ago, NOAA requested input on user's thought on the Magenta Line. The charts had not been updated in 70 years and was not useful. How boaters use the Line has changed in the modern age; instead of being a reference point it became a navigation track line which led to some unfortunate situations. The Magenta Line was removed and after public comments, restored it where there was data to support it and to maintain it. Considerable effort; is surveyed once a year. Looking at reports from crowdsourced platforms to adding some of the information to charts. It will take about three years to rescheme the whole AIWW.

Member Kudrna asked if the surveys meet NOAA's standards and have they been used in any of NOAA's revisions. Dr. Alexander said that they do meet the survey standards and that some has been submitted for review from the St. Mary's River. That data was provided to the requester even without NOAA review, as a graphic stating that it came from a certain provider. Kudrna added that recreational areas are not going to rise to high priority to NOAA any time soon, so providing 3rd party information to users without extensive review and validation would be useful.

Chair Perkins asked if the upcoming LiDAR surveys for the complying disposal areas will be topobathymetric surveys. Mr. Warren answered that they will be and they will include a new mobile LiDAR system.

GEOSPATIAL MODELING & COASTAL RESILIENCE SPEAKER PANEL

Coastal Monuments & Beach Profiles – Matt Wellslager, Chief, South Carolina Geodetic Society

Member Wellslager discussed coastal monument projects on Southeastern coast. Beached, barrier islands, and primary dune lines are the first line of defense for natural disasters and one of the most important components of coastal resilience. In 1988, 400 monuments were created to enabling studies to assess sediment transfer. A year later, Hurricane Hugo destroyed many of these monuments. All of them have been remonumented and the North Carolina post-Hugo disaster relief fund paid for surveys to establish accurate orthometric heights for the monuments.

The information is being input to ArcInfo and the South Carolina Geodetic Society is tasked with determining which monuments need to be replaced or destroyed and getting the information into a database accessible to National Spatial Reference System users. The South Carolina Office of Coastal Resource Management will monitor the monuments and make applications available for public use. There are now about 560 monuments and great care has been taken to replace the old controls in a way that previously collected data will still be useful. GPS has changed the way data is being collected.

Today, we use Global Navigation Satellite System (GNSS) receivers with the real time network for land-based surveys, information is transferred to vessels with HYPACK to create profiles after a storm, looking for areas of erosion and deposition. The 560 marks are the point of beginning. Besides OCRM's purposes, the surveying community had a use for this spatial data, land surveyors could transfer elevations and planning areas within the coastal counties would have boundary surveys tied to state plane coordinates that were transferred from these. We had accurate elevations and coordinates that were made available. He went on to discuss the process of the project in detail. In 2011, NGS set out to create a webinar for anyone looking to perform real time kinematic work. Position Dilution of Precision has been reduced significantly as they track two different constellations now, GPS and GLONASS. DSWorld software, available from NGS, overlays data from the National Spatial Reference System onto Google Earth. Some of the recovered sited used to be on dry ground but, by 2014, are now underwater. South Carolina DHEC-OCRM decides which monuments are replaced, destroyed, replaced. When monuments are destroyed, the replacement is usually positioned perpendicular to the original usually within tenths of a foot or better, but often construction has destroyed the original site and new sites close by contain obstacles like multipath and blocked horizons. Two observations were taken and there were times when they did not agree and a third observation was needed. The Grand Strand area now has 172 occupied monuments, 73 new monuments done with the real time network – this was done in 5 months where it would have taken a year and a half with static observations. Height modernization project complete. 22 of the new e-stations that we're occupying with height modernization will be used for ten-minute observations. These beach surveys are all done for the purpose of regulating where construction can occur, where sediment transfer is taking place, what is going on with the dynamic situations of the beach, littoral zone and near-shore.

***Resilient Coastal Systems & Community Planning* – Dr. Nicole Elko, Coastal Geologist, Executive Committee on the American Shore & Beach Preservation Association (ASBPA)**

Dr. Elko discussed the ASBPA and national advocacy's role in community resilience. ASBPA, USACE, and the National Research Council have been close allies since its inception in 1926. ASBPA is a national association that represents more than 1,000 members around the globe advocating for healthy shorelines, while helping coastal communities become more resilient. Partnerships with NOAA have not been very strong in the past, but Dr. Elko sees that beginning to change. Through the CERB and its strong technical side, ASBPA advocates effectively for

research funding and will be taking a more active role in organizing the near-shore research community. ASBPA held a meeting in Kitty Hawk, North Carolina to discuss the direction of near-shore research over the next decade. The meeting was premised on the idea that societal needs could be identified as specific data gaps that were needed to improve coastal resilience. Observation and predictive skills for things such as wave transformation models are very good, but not as good at predicting flooding, shoreline change, and post-storm recovery. Low-cost means of measuring extreme events are needed to better understand overwash and overland flow, sediment transfer, and rapid bathymetric change. A white paper will be published soon that identifies the needed tide, current and water level observations that NOAA could be of great help.

Resilient Coastal Systems and Coastal Planning was a white paper published by the journal Shore & Beach earlier in the year which adopted the National Academy of Science definition or resilience, categorizing it into four phases: prepare and planning; absorbing the occurrence; recovery; and adapting. In the paper, resilience is broken down into three categories: engineering, ecosystem, and community resilience and provides recommendations on each category. For engineering, recommendations include beach renourishment as well as replicating nature, recognizing risks, and providing multiple levels of protection. USACE is making strides toward quantifying resilience which will be very valuable in its future work working with coastal communities. NOAA planning tools could provide great assistance to coastal communities' ability to adapt and evolve. There is a need to utilize existing data sets to answer fundamental research questions and to put data to work with research funding in order to improve the models for communities.

***Coastal Resilience in South Carolina* – Patrick Moore, Environmental Stewardship Manager, South Carolina Ports Authority**

Mr. Moore focused his discussion on how SCPA approaches storm/flood preparation and some of South Carolina's ongoing coastal management issues. The three key components for addressing these issues consist of their hurricane and flood plan, emergency action plan, and the continuity of operations plan for the Port of Charleston. The emergency plan addresses each terminal individually. Sea levels are rising and, simultaneously, the terminals are sinking. Mr. Moore discussed the properties of each terminal and how they differ from one another in extreme weather as well as the importance of having safety procedures in place. He cited an incident when workers went to lunch without locking down their ship to shore crane adequately and a microburst storm popped up the ended up causing $7 million in damage.

Mr. Moore showed pictures of popular downtown Charleston attractions after flood events demonstrating the severity of the issue in South Carolina. The Market Street Drainage Improvement Project is meant to address the flooding problems downtown. It consists of a 10' diameter tunnel 160' below the ground but is not a long-term solution to the problem.

In South Carolina, when coastal properties are threatened, the owners have to get an emergency order from the state. New sea walls are illegal and existing sea walls that are 50% or more destroyed cannot be repaired. In some cases, relocating beach front houses might be the only financially feasible option.

The private sector plays a huge role in resilience and coastal protection in South Carolina. A plan is being implemented to surround urban areas with permanently protected land. This may prove to be the most significant long-term portion of South Carolina's efforts to achieve coastal and wetland protection and resilience.

***CSC Briefing on Shoreline, Inundation & Sea Level Rise Modeling and Visualization Tools* – Nicholas "Miki" Schmidt, Chief, Coastal Geospatial Services Division, NOAA Coastal Services Center**

Mr. Schmidt shared some of the modeling and visualization tools his office has been developing to support the coastal resource management community. In developing Digital Coast, his office has worked with communities to identify barriers they had in addressing their coastal issues. The issues that came up repeatedly helped to frame the format of Digital Coast. Coastal data was once not available, but now there is too much for the community to digest. The community has perceived that state and federal efforts have not been coordinated with each other, so NOAA Coastal Services Center has worked very hard to establish partnerships working across agencies. Many technical tools have been developed, but the larger constituency needs broader, web-based tools and training to make use of the data that is available. The CSC is trying to build awareness of the impact of the tools and data being provided and include policy-makers in the discussions. The data provides a baseline and framework for everything, the key is to extract the data to produce outcomes. Mr. Schmidt discussed the capabilities of some of the tools available on Digital Coast, including sea level rise visualization tools and, more recently developed, a Lake Level Viewer for communities around the Great Lakes. The Lake Level Viewer includes the ability to monitor lake level drop, which users in the area really wanted because of the potential impacts. Coastal County Snapshots provides easily digestible information to counties on three key areas: flood exposure, wetlands benefit, and ocean and Great Lakes jobs. Integration of various data sets in a simple format to convey the issues.

An important port resilience planning tool has been developed as a prototype but has not taken off yet. It is a resiliency checklist that reviewed 26 ports around the country and mapped their risk factors. Ports need to consider factors such as impacts on natural resources, population and land coverage changes, and frequency of disaster declarations.

<u>HSRP Q&A with Speaker Panel</u>

Chair Perkins suggested that HSRP members attend the Coastal GeoTools conference that will be held March 30 – April 2 in Charleston.

Member Jeffress asked if CSC works with FEMA. Mr. Schmidt replied that FEMA is involved in their work in many ways and they utilize FEMA data in several of their tools.

Member Edwing asked what kind of data gaps Digital Coast had in the Great Lakes. Mr. Schmidt answered that it is topobathy data to model what lake level drops would look like.

Mike Aslaksen, Director, Remote Sensing Division, National Geodetic Survey, asked Mr. Schmidt to provide more information on how the data from this activity has been worked into Digital Coasts. Mr. Schmidt enumerated some of the many sources of data that are incorporated into the program. NOAA's LiDAR data and NGS' orthophotography, imagery, and land cover data are housed on their servers. They do no duplicate the distribution of resources from NOAA or other agencies, but provide links to make sure users can access what they need.

Mike Aslaksen asked the Dr. Elko what data NOAA could target in order to influence how they do their work. Dr. Elko said that NOAA is doing a great job at data collection but would like to see more application of data sets, especially in terms of coastal resilience. Perhaps creating a time series of coastal land use would be illuminating.

Chair Perkins asked for more detail on Dr. Elko's remark that she would like better observation during extreme weather events. She replied that she would like to see an interagency collaboration focusing on a frequently inundated area, such as Rodanthe, North Carolina, to gain more precise water level and current measurements, sediment transport measurements, and coastal processes data.

Member Kudrna asked if Digital Coasts recognized elevation changes caused by storms and provide information for planners concerning flood impacts. Mr. Schmidt responded that if it is known what the rise in the water would be, it visualizes where the water would go at a certain height. The software incorporates the real time lake level, but does not project inland infrastructure impact caused by a surge event.

Luncheon Speaker

Margaret Davidson, NOAA Senior Advisor for Coastal Inundation and Resilience

Ms. Davidson gave a brief overview of her work with NOAA over the last 20 years and discussed how she became a geospatial metadata and shallow water bathymetry advocate. She said that, while there is an Integrated Ocean and Coastal Mapping Plan, there is no national coastal mapping program. She commented on the problem of the National Climate Assessment relying on research that is a decade old. In her time at NOS, Ms. Davidson has witnessed a significant increase in the amount of complementarity and communication, but much more is needed to address changing environmental weather and climate conditions. Climate change and natural disasters are putting more pressure on already strained budgets. It is important that people in the maritime community figure out how to get from more, better data to actual information,

knowledge, and even wisdom. Big data is going to completely change the maritime community and bring into focus issues that have not previously been a concern, such as the social-economic vulnerability of surrounding communities. Commerce has to include a true coastal intelligence program. Partnering with the US Chamber of Commerce has led to increased understanding for communities around the Gulf of Mexico that continuity of business does not amount to much if there is no one in the area to buy goods and services. Private companies in these communities, including Coca-Cola and Home Depot, have begun funding community and disaster resilience portfolios.

Key messages from the coastal part of the National Climate Assessment most pertinent to HSRP are coastal lifelines at risk and economic disruption. The HSRP should be leveraging the opportunities that come with changing Administrations in Washington by having a national coastal mapping program that is ready to be implemented and includes the components the Panel believes to be important. The HSRP is a great venue to consider how to develop a coastal program out of the work being done by USACE, FEMA, NOAA and USGS. Preparing a transition strategy now and framing it in two slightly different ways for presentation to whichever party prevails in the election could be very effective. Ms. Davidson insisted that the country needs a large infrastructure bank and a comprehensive strategy for intermodal development.

Mr. Aslasken noted that the IOCM has developed a national coastal mapping strategy collaborating with USGS, USACE, and NOAA. Ms. Davidson responded that she was aware of the strategy, but that strategies and reports are just a necessary beginning – a real national coastal mapping program needs to get underway.

Vice Chair Hanson asked how to get the current Department of Commerce Secretary or her successor to consider coastal issues to be a priority. Ms. Davidson replied that Secretary Pritzker understands the coastal economy issue. She and Administrator Sullivan have embraced community resilience and are meeting to discuss a Department of Commerce-wide performance measure on community resilience. NOAA operates within the Economic Development part of OMB with HUD and partnering with Secretary Donovan may be a great opportunity because he understands port and coastal issues very well.

Chair Perkins asked Ms. Davidson to score the usefulness of FACAs in general and the HSRP in particular. Ms. Davidson said that she has seen more effective advisory committees. She challenged the HSRP to take advantage of the upcoming transitions and not allow NOAA to be complacent. Member Kudrna asked if she believed educating and informing is the principle role for FACAs. Ms. Davidson responded that the primary role of a FACA is to ensure the Department is executing its mission with alacrity and integrity, followed by advising on the most effective ways of operating. The National Science Foundation's FACA is an excellent example of a high-functioning advisory committee whose efforts have led to enviable budget increases for NSF.

BREAKOUT SESSION DE-BRIEFS TO HSRP

Port & Harbor Expansion

Captain Brennan reported that the group spent the first 30 minutes speaking broadly on NOAA products and capabilities and what that meant for port expansion. NOAA does have a role in providing data about port and harbor expansion in a meaningful way that allows decisions to be made in a timely and effective fashion. NOAA needs to ensure new approaches, once they are surveyed, get charted as soon as possible. Members of the group mentioned the possibility of the Thomas Jefferson vessel addressing unexploded ordnance in its 2015 survey, though that would probably be outside of the scope of its mission. Participants said that the new chart was meeting their needs and that it has sufficient expanding capability. A pilot in the group said he would like greater accuracy about pier facilities and Captain Brennan will look into how salinity probes can be utilized in navigational products. The group felt that most pilots do not understand the capabilities of a fully-populated ENC and proposed a demonstration project presenting different display options that would encourage them to make use of it.

The group discussed the value of the salinity probe data that USACE collects, foregoing the channel condition reports in favor of providing that information geographically on the chart, and the push for S102 formats to better ingest overlays. More focus should be put on expanding web services and the putting the data in more usable formats, such as apps. Working group participants discussed the benefits of being able to show soundings in the federally maintained channels and areas where there are depths deeper than the project depths. There is also a need to put a higher resolution shoreline on Band 6 charts.

The group's key recommendation is to make use of E-Hydro to streamline ingesting USACE data.

Atlantic Intracoastal Waterway & Recreational Boating

Member Proctor reported that the group had a very active discussion on the issues facing the AIWW. The finding of highest priority is to get the ENC First production line implemented as quickly as possible. This finding came up at the New York meeting and the group felt that it needed to be reiterated. Going hand-in-hand with that is the liaison with USACE to ensure that E-Hydro be implemented, standardized, and integrated into ENC as quickly and seamlessly as possible. The group recommended creating much higher resolution charts of the AIWW and using ENC as the preferred method of depiction. The group would like feedback from NOAA's Chart Division on how much work it would be to compile this data.

The working group requested an update on the status of the Magenta Line at the next meeting. They discussed the possibility of crowdsourcing data, but felt that they have a trusted partner in USACE to perform an AIWW survey at least once a year. This is the sort of data that NOAA should be implementing into its charts pro forma, but more investigation is needed on how crowdsourcing can provide information for the products navigators need.

Member Miller noted that problems outside of NOAA's scope, such as dredging, were discussed as well.

Geospatial Modeling & Coastal Resilience

Mike Aslaksen reported that the group felt foundation data is a very important data set and more frequent collections of that data is needed. The working group emphasized the importance of having this data collected pre-event to allow for better damage assessment, followed by post-event collects to assess resiliency. Education at all levels is needed, but individuals and organizations at the local level tend to be more engaged, especially when issues like coastal flooding and water quality are tied in. There needs to be a collective resiliency plan involving government, NGOs, and industry as well as prioritizing research and development efforts to assess resiliency and develop policies. Resiliency metrics need to be developed and definitions established for terms such as "sustainability". Software products like Digital Coast are important, but more tools are needed that can be adapted to local purposes to help communities better understand what is happening in their area. Data and tools need to be developed that connect infrastructure and supporting elements along with individual interest areas.

Mean Sea Level Tidal Datums & Mapping for Coastal Flooding and to Address FEMA Flood Insurance Rates Along the US Coast

Dr. Gary Jeffress, HSRP

Member Jeffress discussed the importance of accurate tidal datums and how they integrate with the National Spatial Reference System (NSRS). The Texas Coastal Ocean Observation Network runs a tide gauge network in cooperation with CO-OPS that allows users to view the latest observations from each of their stations and the primary water level. All of their stations are constructed, maintained, and operated to NOAA standards. In 2012-2013, they performed a project for USACE to link their historic water level benchmarks to modern tide gauges as well as to the NSRS. Height modernization funding is being used to expand the number of tide gauges around Texas and equip them with CORS stations using GPS.

Coastal flooding is a short-term effect of sea level rise; long-term sea level rise is an issue that really needs to be addressed. Texas' longest-operating tide gauge has recorded a sea level rise rate of about 6.39mm a year since 1909. FEMA is responsible for the flood insurance program along the river systems and the coasts. After the last series of hurricanes, FEMA has determined that the income they derive from flood insurance policies is not going to cover major events much longer. FEMA has carried out a major flood insurance remapping campaign and adjusted their rates to take into account the actual risk of living in coastal areas. Flood insurance rates are preparing to increase dramatically, especially for people that find the they are in flood zones. Member Jeffress presented an example of a property on an estuary in Galveston Bay whose current flood insurance map does not match the actual topography of the property's location. After Hurricane Ike, FEMA decided to remap the area but still did not capture the actual

topography of the ground. The gross errors in topography do not leave one with a lot of confidence that the information is very accurate. Under the currently used map, the owner of this house could get flood insurance for $457. Once the new maps are accepted, the flood insurance for this property will jump to thousands of dollars. This example demonstrates how critical it is to measure tidal datums accurately and the liability that's attached to establishing floor levels relative to flood insurance rate maps.

HSRP Discussions & Deliberations

Scott Perkins, HSRP Chair

Chair Perkins began the HSRP discussion and deliberations by asking if the group is happy with what they have seen E-Hydro's launch or if they should reinforce their recommendation from the previous meeting. RDML Gerd said that in going to ENC First, NOAA is reprioritizing work internally in order to get this done but they will not be able to produce charts at the rate they have been because they will be focused on getting the database started. Beyond resources, retraining and realignment within the workforce is happening. Member Miller suggested recommending that E-Hydro incorporate all of the available USACE data. Member Shingledecker suggested a recommendation that could help facilitate and enhance the coordination between NOAA and USACE. RDML Glang replied that NOAA has one staff person who interacts full-time with USACE at the headquarters level as part of the Corps' team for implementation and development of E-Hydro. At the time of the meeting, there were five districts using E-Hydro to produce survey products and as that data become available, NOAA is capturing and evaluating it. NOAA has had discussions with USACE about MOAs but it is probably too soon to create any for E-Hydro because it is still in development. Member Miller suggested that having a broad umbrella agreement would help facilitate getting individual agreements in place. Ms. Medley noted that USACE is federally mandated to provide data sets to NOAA, so it would be unnecessary for this issue. Mr. Bradley said that even with the umbrella agreement in place, any time NOAA wanted to set up individual projects with USACE, separate agreements were still necessary.

Member Kudrna suggested carrying forward the point that the 100-year backlog for charting has slipped even further due to lack of funding

Member Kelly noted that once E-Hydro is operational, the capacity to handle large quantities of data will increase. More partners would then be useful in providing data sets and crowdsourced information that could help NOAA to improve its products. He added the NOAA should play a role in steering crowdsourced data into being more useful. Chair Perkins noted the Administrator's concern that NOAA use only trusted partners' data in creating accurate and authoritative charts. USACE and USCG are considered trusted partners. NOAA is funding a crowdsourced bathymetric database together with IHO and is making progress on providing guidance to different kinds of users on what is important when collecting their data.

Member Miller asked if E-Hydro would be the key to ingesting crowdsourced data. Ms. Medley responded that E-Hydro is not intended to provide data for public consumption. Chair Perkins noted that OPUS wasn't either in its original form but evolved to be more broadly useful. Member Blackwell pointed out that the data in the OPUS database is not considered authoritative, whereas NOAA's data is so. Capt. Brennan said that applying uncertainty to their data is what enabled them to assess the quality of the data and allowed them to bring in more data with more confidence.

RDML Glang discussed how the crowdsourced bathy database that is being developed will function.

Member Kudrna requested that at the next meeting, NOAA provide the Panel with their strategy for moving forward on the issue of crowdsourcing. Member Miller commented that she would find it helpful to get a broad overview from the NAV Manager on key topics before going into the stakeholder sessions.

Member Jeffress suggested that the HSRP should encourage NOAA to explore autonomous systems for bathymetry of all depths of water and discussed affordable options for mapping using small autonomous surface vehicles. He requested more information on where NOAA stands with autonomous vehicles.

The Panel discussed whether shallow water bathymetry is something that should be put forward as a recommendation.

Public Comment

Clark Alexander, Skidaway Institute of Oceanography, pointed out that NOAA collects a lot of hydrographic data and multibeam data, but not all of it is collected in a quality format that can be put into hydrographic data sets and made available to researchers and the public. Someone from NOAA should be assigned to collect this information in a way that is able to be processed and delivered to the public in a usable form. Member Armstrong responded that there is a multibeam advisory committee that supports UNOLS multibeam-capable ships. There has been discussion on extending that to NOAA non-hydrographic vessels, but no conclusion on how to do that has been reached. The Office of Coast Survey has a hydrographer conducting a study on multibeam management procedures. Dr. Callender added that having NOAA ships with insufficient expertise is a regular challenge that they try to overcome. IOCM has made tremendous progress in convincing other parts of NOAA that their data has value and that they need to collect it to a known standard.

John Hersey commented that the appropriate way to handle, use, and incorporate crowdsourced data into product work flows needs to be established, but that the work needs to be funded.

Jason Creech suggested exploring ways to facilitate data transfer from industry partners. He discussed two recent projects in which states and the federal government conducted cost-shared surveys of territorial seas to NOAA standards and updated the entire state's charts. He asked if there might be a future for similar cost-sharing partnerships. Wind energy is expanding on the east coast and BOEM is contracting surveys for off-shore sand resources. These will be the biggest surveys on the east coast in the next decade and NOAA needs to figure out how to take advantage of them and make sure they meet NOAA charting specifications. Mr. Creech added that there should be an initiative to address chart clutter. RDML Glang responded that NOAA is looking at ways to improve "chart health" and is working with Canada on standardization.

Adjournment

The meeting was adjourned at 5:51 p.m.

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Thursday, September 18, 2014

The meeting was called to order at 8:32 a.m.

Chair Perkins led the Panel through a recap of the previous day's presentations and considered the charge before them: to conclude the meeting with solid draft recommendations to the Administrator. He was pleased to receive email comments from people listening to the webinar. Member Kelly commented that some of the presentations were duplicative and that time may have been put to better use. Chair Perkins responded that he and staff had hoped to get the presentations before the meeting and delete duplications. It might be worthwhile to make that a requirement for future meetings. Vice Chair Hanson added that it might be helpful to request that presenters include a slide of what their request is to the HSRP.

IOCM Ocean Coastal Mapping Strategy

Mike Aslaksen, Chief, Remote Sensing Division, NGS

Mike Aslaksen discussed the National Coastal Mapping Strategy which has been worked on heavily for the last year and a half under Chris Parrish's leadership. The Ocean Coastal Mapping Act of 2009 mandated the work, recognizing a clear and growing need for coastal mapping data. After Hurricane Sandy it was clear that the data needed to support much of the modeling, especially in shallow areas, was not available. Mapping programs in USACE, NOAA, and USGS have been working together, along with the Navy, through JALBTCX with very clear federal responsibilities assigned to each partner. Private partners also contribute heavily to the data collection. The common specifications matrix breaks down into three parts: emergency response, environmental mapping, and charting. The program utilizes a whole-life cycle

approach, focusing on how often resurveys should be done, what they would cost, and what the objective really is. JABLTCX is always considering what technologies are coming available and what investments should be made.

Member Jeffress asked why FEMA is not using Digital Coasts for their insurance mapping. Chair Perkins did not wish to answer for FEMA, but he noted that they have moved away from flood mapping to risk mapping which changed the cartographic requirements. Member Blackwell added that FEMA's flood insurance rate mapping program is just getting underway and, as the Technical Mapping Advisory Council (TMAC) delves into the various components, many of these issues will be addressed. Chair Perkins commented that using the best data available for all applications may be part of a National Mapping Strategy. The TMAC's first in-person meeting will be at the end of September. Member Blackwell said that she would be happy to share information gathered from TMAC meetings with the HSRP at the next meeting.

Member Kudrna asked if EPA and the Department of the Interior are involved in this initiative. Mike Aslaksen replied that those agencies are primarily represented by USGS. IOCM does reach out to other agencies as much as they can.

NOAA/NOS Congressional Budget Update

Dr. Paul Bradley, NOS Policy, Planning & Analysis Division

Dr. Bradley provided the Panel with an update on NOS Policy, Planning & Analysis Division activities. NOS budgets decreased by 20% between FY2010 and FY2013, but have been on an upward trend since then. This speaks not only to a recovering economy but also to the messaging that NOS has been doing within the agency, the Administration and on Capitol Hill. Dr. Bradley focused his discussion on Navigations, Observations, and Positioning, one of the three subprograms of NOS' budget. Congress has supported a budget restructuring which allows more focus on NOS priorities and more flexibility in tough budget years.

Several lines items in the FY2014 NOS budget have been subsumed into the Nav, Ops, and Positioning line. The exception is any money that leaves NOS, such as the IOOS program budget. IOOS Regional Observation has doubled since 2010. The Redress Survey backlog is the one budget line in NOS that saw a decrease in FY2014.

For FY2015, OMB has proposed funding the program at the same level as FY2014. Two notable increases within the budget are topo-bathy LiDAR and a $1 million increase for marine sensor development under the IOSS Regional Observation line. The Nav, Obs, and Positioning budget passed through Full Committee and is now awaiting authorization with the rest of the appropriations bills. The total proposed NOS budget is $196 million. External partners managed to get language into the bill recognizing PORTS as an important program and encouraging the President to request funding for the full operational costs associated with PORTS in the future. At the time of the HSRP meeting, Congress was facing the possibility of a continuing resolution

running until December 11, which would mean NOS receiving the same appropriations from the previous year. The satellite program has been granted the flexibility they will need to maintain their launch schedules.

Dr. Bradley discussed several pieces of legislation related to NOAA that are now before Congress awaiting action. The Hydrographic Services Improvement Act, which provided foundational authority for many NOAA programs, expired in 2013. NOS still retains the ability to perform the work, but do so without the authorization of appropriations. Congressman Young has introduced an HSIA reauthorization bill and NOAA staff has testified on HSIA and IOOS reauthorization. The IOCM Act expires next year and NOS staff has been diligently promoting the successes of IOCM's activities to Congress. Efforts have been made to integrate HSIA and IOCM so that they function together in tandem. The Map It Once, Use It Many Times Act would call for a wholesale reorganization of federal geospatial activities.

Several of NOAA's priorities have been addressed before Congress, such as the Arctic Hydrographic Survey Program. Dr. Bamford has briefed the Senate Oceans Caucus on NOAA's ocean and coastal observing programs. Certain members of Congress, all from coastal districts, have been identified by NOAA leadership as being especially interested in NOAA's services. Dr. Bamford and Dr. Callender meet with them about data and projects relevant to their Congressional districts. Dr. Bamford and Louis Uccellini, Director of the National Weather Service, will be meeting with be meeting with the Congressional PORTS (Ports Opportunities, Renewal, Trade, and Security) Caucus to discuss the programs and products that NOS and the NWS provide in support of maritime commerce. Dr. Bradley asked for the HSRP's feedback on how to make that meeting more engaging.

Dr. Bradley briefly discussed pre-scripted FEMA mission assignments. The Coastal Advisor position for response and recovery is moving forward while the others have been rejected. The Committee on the Marine Transportation System is meeting in October for the first time in six years and will be working with USACE and National Academy of Science Marine Board to develop a resilience workshop for developing resiliency metrics.

Member Kudrna encouraged NOAA representatives to use the phrase "Oceans and Great Lakes" and noted that Senator Kirk from Illinois would be a great advocate and should be added to the list of engaged Members of Congress. He asked what Dr. Bradley what he thought of the HSRP sending a report to Congress, as Sea Grant's FACA does. Dr. Bradley said that it is something the Panel should consider, but he has not considered it thoroughly enough to provide any suggestions on how to go about doing it. He added that after seeing the amount of time and effort that went into creating the Most Wanted report, it would have to be something that really served the Agency well in addition to informing Congress. Member Kudrna asked if thought the Most Wanted report may have had something to do with the fairly dramatic increase in funding for NOS mapping revisions. Dr. Bradley responded that has wasn't sure if funding increased or

had just been restored to previous levels, but changing the name to include the word "priority" may have helped.

Member Blackwell asked Dr. Bradley for his thoughts on what may have led to IOOS Regional Observations getting an increase. Dr. Bradley said that the big difference was IOOS External Association's advocacy which made a big impact on people's awareness of the work done by the Regional Associations. He added that NOS does not have that support for Navigation Services.

Member Miller asked if there was any funding on the horizon for the Digital Coasts Act or the IOCM. Dr. Bradley responded that there is a lot of interest but he does not anticipate seeing any new funding being allocated to those activities.

Member Shingledecker asked if it would be beneficial for the HSRP to push FEMA on pre-scripted mission assignments or just wait. Dr. Bradley said that Dr. Sullivan is aware of the issue and has met with FEMA leadership to discuss it. Mentioning it in a letter may convey that HSRP is keeping an eye on the issue.

NOAA Navigation Services Office Updates

RDML Gerd F. Glang, Office of Coast Survey

RDML Glang presented what he feels to be the priorities for the Office of Coast Survey and what progress has been made on them. The four priorities for OCS are:

- Transform charting - getting charts out more timely and with better quality in a variety of formats;
- Innovate data collection - bringing new technologies to bear on hydrography;
- Change navigation - leading the future of how users navigate and utilize NOAA products;
- Leverage expertise - utilizing NOAA's unique value proposition for end-to-end service.

RDML Glang discussed how various users are grouped and how those stakeholders use NOAA products. Information has to be formatted and distributed in particular ways to satisfy the needs of the end-users and RDML Glang discussed some examples of how Navigation Services has interacted with these consumers. How mariners use NOAA charts has really changed and the information content that they need to make decisions is currently not rich enough. NOS envisions a focused effort to improve the content of ENCs in ports and harbors. Many of the commercial pilot support tools do not utilize the full range of NOAA data and NOS want to make a more deliberate effort to build relationships with software vendors to help improve their products meant to assist a pilot's decision-making. A lot of time and energy is spent on developing interagency relationships with NGA and Navy. Outreach to recreational boaters has been through customer satisfaction surveys, as well as attending boat shows and contracts with US Power Squadron and other organizations. More recreational users are using apps and want improved tide and current information. The databases that NOAA is building are all geared

around GIS technology and many non-navigational users, such as the reinsurance sector, are very interested in NOAA services and data. Software developers have been invited to attend a one-day seminar of NOAA presenters discussing their products and services with the goal of getting developers excited about being more innovative and delivering better data.

RDML Glang discussed some of the new charts that have been created, including Charleston and the St. Mary's River. PDF charts were made available on a trial basis for users that may not need the overlays. This received a very positive response. Significant improvements have been made to the Navigation Services website and they have been pushing to get a revamped electronic version of Coast Pilot to be accepted by USCG as an acceptable navigation tool. The transition from lithographic printing to print on demand has led to many more interested printing partners offering competitive rates. One of the major priorities in the upcoming roadmap will be to narrow the production lines down for ENC First and building its database.

RDML Glang's key concern is that NOAA has two 46-year old vessels devoted to mapping in the Arctic and Alaska that will be retired in the next 10-12 years. It takes ten years to build a new ship, so by the mid-2020s NOAA will have no Arctic surveying capability. About 40,000 square nautical miles of the US exclusive economic zone in the Arctic are critical or are navigationally significant for the purpose of the marine transportation system. The cost-value of replacing the ships is not an enticing proposal for the private sector. Losing this capability is something that HSRP should be aware of and reflect on.

Member Jeffress asked if Google has approached the Office of Coast Survey about incorporating their charts into Google Ocean. RDML Glang said yes, they have met with Google, but was unaware of anything emerging as a result. Esri and Raster Chart Server make all of the charts available and a tile service is being developed in an open source format that would fit readily into Google Maps.

Member Miller asked about the operational schedule for the Arctic ships. RDML Glang answered that the FY2014 allocation was 180-190 days at sea for each vessel. Maintenance and staffing have been key issues for both ships. The oil and gas business has attracted so many licensed engineers that NOAA's productivity has been down due to a shortage of expertise. Repairs are needed on both vessels over the next year.

Member Barbor shared his concerns that ENCs are not fit for the needs of SOLAS class vessels. RDML Glang said that there is a change in use going on as maritime industries transition into the electronic world and if NOAA can fully populate its database in the next few years, they can start improving the information content.

Vice Chair Hanson asked what a fully funded NOS budget would look like and suggested having survey ready projects in mind when requesting funding. RDML Glang responded that there isn't a single area where you could put a lot of money and see significant progress. There are many supporting pieces that need to be put in place before a successful survey can be executed. Data

processing would still be a huge challenge if funding was made available to increase the number of surveys. Vice Chair Hanson said that NOS needs a more concrete 5-10 year plan for spending money and providing benefits if they are going to sway OMB into increasing their funding levels or convince contractors to invest in equipment and innovation. Member Edwing added that this approach has been successful for IOOS Association.

Rich Edwing, Center for Operational Oceanographic Products & Services

Member Edwing discussed how CO-OPS performs outreach to the local maritime community. CO-OPS serves a number of customers outside of the maritime transportation system. CO-OPS has been restructured into four programs that interact with different groups of stakeholders. Mapping and Charting Services provide mainly tidal datums to an internal federal customer base. The Maritime Service program is the externally focused division that works alongside the Office of Coast Survey and NGS to deliver its products and models that provide oceanographic information. The Resilience program serves the non-navigation community on coastal hazards, such as storm surges, sea level trends, and ecosystem restoration and management. The Ecological Forecasting program functions in support of the NOAA-wide effort on ecological forecasting and have been forecasting harmful algal blooms as well as hypoxia and pathogens. Communications specialists, along with project leads and field crews, gather feedback from consumers.

CO-OPS' website is the main forum for informing the public about their products. CO-OPS has contracted with a surveying firm to gather information on how to improve the website and how it is currently being utilized. Program Managers attend and present at conferences but events and project-oriented opportunities, such as PORTS dedication ceremonies, have been the most successful mechanism for engaging with communities. The greatest outreach challenge is CO-OPS' lack of physical presence around the county. They are working through navigation managers to address this issue, but there's only so much they can do. Member Edwing would be interested in HSRP's perspective on how to enhance the effectiveness of their outreach.

Vice Chair Hanson commended the PORTS dedication ceremony in Jacksonville, Florida and said that the event was very successful. Key to that success was bringing in Dr. Sullivan to demonstrate NOAA leadership's support for the program.

Chair Perkins asked Member Edwing to share his biggest concern that he would like the HSRP to be aware of. Member Edwing responded that PORTS funding has been the biggest issue for him. It is his career goal to shape PORTS into a sustainable business model. Everybody agrees that the system provides a valuable service to the nation.

Juliana Blackwell, National Geodetic Survey

Member Blackwell discussed some of the highlights of the previous year for the National Geodetic Survey and addressed some of the HSRP's recommendations. Many of these activities,

in addition to supporting coastal intelligence and NOS priorities, fall directly under the NGS 10-year strategic plan. Functional goals of the plan include: supporting users of the National Spatial Reference System; improving and modernizing the NSRS; expanding the stakeholder base through education, partnerships, and outreach. NGS collected more than 2,700 square miles of topo-bathy LiDAR data using federal assets as well as third party contractors. They have received funds to accelerate the collection of airborne gravity as part of the GRAV-D initiative which allowed NGS to complete mapping of the Great Lakes regional area. This data is being processed and will go towards experimental geoid models. As of the beginning of August, NGS had surveyed 38% of their total area, 77% of that data is publicly available. These surveys will become the basic model for a new vertical datum that will hopefully be widely adopted and used for elevations. GPS and GNSS data will be directly applied to the model. This will be a great improvement in being able to provide consistent and up-to-date elevation information. The program is off to a good start and they hope to get information to stakeholders about what changes to expect.

Member Blackwell discussed some of the other projects that NGS has been involved with over the last year that, while they may not relate directly to the HSRP's work, they demonstrate some of NGS' capabilities. These include partnering with NPS to survey to top of the Washington Monument.

NGS is looking at how to take information from one datum and translate it into another so that it's more useful to their consumers. Tools like GEOCON and GEOCON11 have been developed that allow GIS users to transfer data between different versions of NAD 83 to improve comparisons. OPUS-Projects is the next OPUS development allowing for multiple observations on multiple stations. It uses NGS software to come up with positions and aide in getting the information into the NSRS. By the time of the next HSRP meeting, Member Blackwell hopes to have more information to share on third party users of OPUS-Projects.

NOAA's hiring freeze has ended and NGS has filled five crucial positions and has made great workforce advancements in the last two years, but there is still a long way to go. NGS has advertised for two Regional Advisor positions. Having individuals in all of the identified NGS regions will go a long way for stakeholder outreach.

NGS has collaborated with the National Society of Professional Surveyors and leadership of NGS and NSPS meet on at least a quarterly basis and plan to put on a geospatial summit in 2015 together. NGS has engaged the surveying community to gather benchmarks to supplement its data. The NGS101 webinar was conducted as opportunity to reach out to the remote sensing community. NGS will be focusing on reaching out to real time network operators and administrators to discuss the CORS program and what assistance NGS can provide to help the real time network community tie in to the NSRS. There are several height modernization activities around the country and NGS meets with a number of partners on a monthly basis to discuss height mod activities and needs, as well as convening a national meeting each year.

Member Kudrna asked if any NGS upgrades have been incorporated in third party vendor education elements. Member Blackwell said that they have done workshops at state surveying societies. Member Kudrna suggested speaking with vendors about conducting online course units.

Chair Perkins asked Member Blackwell to share her biggest concern that she would like the HSRP to be aware of. Member Blackwell responded that the loss of expertise and the need to fill geodesy and cartographer positions is her biggest concern. Geodesy programs do not exist in universities like they did 20 years ago. The federal government is also having difficulty attracting individuals that possess the necessary knowledge and hiring restrictions limit the number of eligible candidate even further.

Member Jeffress said that he feels OPUS should be considered part of GPS, which has been ranked number one on the White House's list of high-impact observing systems. OPUS is a tool that has made surveyors so much more efficient and carries a huge economic value. He asked if NGS uses Google Analytics to track OPUS use. Member Blackwell answered that they do have information on the number of downloads of CORS data and users of OPUS Solutions. NGS has estimated millions of dollars of return on investment for every $600 purchase.

Member Miller asked if NGS has the equipment it needs to do the survey work they do. Mike Aslaksen answered that, yes, they do as long as the private sector is able to keep the technology up to date. Member Blackwell added that they do not have a dedicated aircraft for gathering GRAV-D information and rely on federal partners to contract out the work.

Recognitions

RDML Gerd Glang, NOS

RDML Glang recognized the service of Member Wellslager for his seven and a half years on the HSRP and presented him with a plaque commending his participation.

RDML Glang recognized the service of Kathy Watson for her 35 years of federal service and presented her with a commemorative pin. RDML Glang added his personal commendation for her eight and a half years of dedication and perseverance working with HSRP.

HSRP Committee Discussion & Deliberations

Scott Perkins, HSRP Chair

Chair Perkins led the Panel discussion.

Among the items discussed:

Member Kelly suggested focusing on the key themes of coastal resilience (shallow water bathymetry) and Arctic programs (the need to replace vessels) are the surest way to trigger a

response. A recommendation should be crafted that emphasizes how NOAA's unique capabilities can be best brought to bear in these areas.

Vice Chair Hanson suggested that preparing a list of survey-ready projects needs to come before discussing assets. Private or industry capability needs to be part of that discussion.

Member Kudrna suggested the potential benefits of having the Secretary address the issue of US infrastructure investment and the role of ports.

Member Wellslager commented on the benefits of NOAA leadership reinforcing to USACE leadership the critical importance of the E-Hydro project.

Several Members recommended exploring ways of making partnerships more effective and providing examples of successful partnerships within the recommendations. Chair Perkins added that partnerships should extend beyond interagency arrangements. RDML Glang noted that impediments to successful partnerships might need to be brought to the attention of NOAA leadership. The Panel discussed this issue at length.

Chair Perkins suggested that the issue of cost-sharing and data-sharing should be part of the National Coastal Mapping Strategy.

The group agreed that the four key topics were:

- Arctic issues;
- Shallow water bathymetry/resilience;
- US infrastructure investment;
- Better facilitation of partnerships, especially the transfer of funds.

Work groups were formed to address each of these issues and craft the recommendations.

Member Fields suggested that the issue of the right whale speed rule should be included in the letter to the Administrator.

Adjournment

The meeting was adjourned at 2:10 p.m.

HSRP VOTING MEMBERS IN ATTENDANCE:

RDML Kenneth Barbor	U.S. Navy (retired), University of Southern Mississippi
RDML Evelyn Fields	NOAA Corps (retired)
William Hanson, Vice Chair	Great Lakes Dredge & Dock Company
Gary Jeffress, Ph.D.	Professor of Geographic Information Science, Texas A&M University, Corpus Christi and Director of Conrad Blucher Institute for Surveying and Science
Ed J. Kelly	Executive Director, Maritime Association of the Port of NY/NJ
Frank Kudrna, Ph.D.	Kudrna & Associates, Ltd.
Joyce E. Miller	Joint Institute for Marine and Atmospheric Research, Research Corporation, University of Hawaii
Scott R. Perkins, HSRP Chair	Surveying and Mapping (SAM)
Susan Shingledecker	BoatU.S. Foundation for Boating Safety and Clean Water
Matthew Wellslager	Chief, South Carolina Geodetic Society

HSRP VOTING MEMBERS NOT IN ATTENDANCE:

Lawson W. Brigham, Ph.D.	Professor, University of Alaska Fairbanks
Captain Deborah Dempsey	Columbia River Bar Pilots
David A. Jay, Ph.D.	Professor, Portland State University
Carol Lockhart	Hydrographic Surveying/LiDAR Hydrography

HSRP NON-VOTING MEMBERS IN ATTENDANCE:

Andy Armstrong	Co-Director, Center for Coastal and Ocean Mapping, Joint Hydrographic Center, University of New Hampshire (UNH)
Juliana Blackwell	Director, National Geodetic Survey (NGS), National Ocean Service (NOS)
Richard Edwing	Director, Center for Operational Oceanography Products & Services (CO-OPS), NOS

HSRP NON-VOTING MEMBERS NOT IN ATTENDANCE:

Larry Mayer	Co-Director, Center for Coastal and Ocean Mapping Joint Hydrographic Center, UNH

DESIGNATED FEDERAL OFFICIAL:

Rear Admiral Gerd F. Glang	Director, Office of Coast Survey, NOS, NOAA

NOAA STAFF PRESENT:

Mike Aslaksen	Chief, Remote Sensing Division (RSD), National Geodetic Survey (NGS), National OS
Paul Bradley, Ph.D.	Planning and Policy Analysis Division, NOS
Captain (sel) Rick Brennan	Chief, Coast Survey Development Laboratory, OCS
Russell Callender, Ph.D.	Deputy Assistant Administrator, NOS
Tiffany House	RSD, NGS, NOS
Rachel Medley	Nautical Surveys Division (NSD), OCS, NOS
Captain (USCG ret.) Russ Proctor	Chief, NSD, OCS, NOS
Lynne Mersfelder-Lewis	HSRP Program, OCS, NOS
Kyle Ward	Southeast Navigation Manager, NSD, OCS, NOS
Kathy Watson	HSRP Program Coordinator, OCS, NOS
Darren Wright	CO-OPS, NOS

SPEAKERS AND ATTENDEES:

Clark Alexander, Jr., Ph.D.	Professor, Skidaway Institute of Oceanography
Captain John E. Cameron	Executive Director, Charleston Branch Pilots Association
Jason Creech	Dave Evans and Associates
Margaret Davidson	NOAA Senior Advisor for Coastal Inundation and Resilience
Larry Dorminy	Senior Editor, Salty Southeast Cruisers' Net
Nicole Elko, Ph.D.	Coastal Geologist, Executive Committee on the American Shore & Beach Preservation Association
Lt Col. John T. Litz	Commander and District Engineer, USACE Charleston District
Byron Miller	Vice President, South Carolina Ports Authority
Patrick Moore	Environmental Stewardship Manager, South Carolina Ports Authority

Jim Newsome	President and CEO, South Carolina Ports Authority
Brad Pickel	Executive Director, Atlantic Intracoastal Waterway Association
Captain Ric Rodriguez	USCG Captain of the Port of Charleston
Leslie Sautter, Ph.D.	Geology Professor, Ocean Mapping & Marine Geology Department, College of Charleston
Nicholas “Miki” Schmidt	Chief, Coastal Geospatial Services Division, NOAA Coastal Services Center
David Warren, PE/PMP	Project Manager, Civil Works, USACE
Justin West	Cartographic Technician, USACE
Brian Williams	Chief of Programs, USACE
Phil Wolf	Chief, Spatial Data Branch, USACE

WEBINAR ATTENDEES

Brent Greenfield
Dennis Gruccio
Chris Freeman
John Hersey
Carol Lockhart
Michael Mueller
David Neff