Meeting Summary
Hydrographic Services Review Panel
April 8-10, 2015
Long Beach, CA

Wednesday, April 8, 2015

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 April 8-10, 2015, at the Long Beach Hyatt, 701 West Ocean Boulevard, Long Beach, CA. 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.

Welcome and Meeting Overview

Scott Perkins, HSRP Chair

The meeting was called to order at 8:28 a.m. Chair Perkins welcomed the attendees and reviewed the logistics and objectives for the meeting.

Dr. Russell Callender, NOS Acting Administrator, conducted the swearing-in ceremony for two new members, Dr. Larry Atkinson and Dr. Dave Maune, and three reappointed members, Carol Lockhart, Joyce Miller, and Susan Shingledecker.

Guest Speakers

The Honorable Alan Lowenthal, US House of Representatives

Rep. Lowenthal shared his experience of the previous day spent going through the Port of Long Beach with NOAA and Jacobsen Pilots Service. The port, which is part of his Congressional District, has led the world in moving towards clean technologies and exploring what can be done in the face of climate change. As the world of global trade changes, with new alliances being formed and ships getting larger, NOAA and the HSRP are here to provide stakeholders with the hydrographic understanding to make it all work. Rep. Lowenthal is very proud of the partnership between NOAA and the private sector both to protect communities and to allow for the tremendous amount of trade that is happening. The partnership at the Port of Long Beach could not have happened without HSRP's input and NOAA's ongoing Precision Navigation piloting programs.

Southern California is facing a sea level rise of two to seven feet by the end of the century. The impact of that on infrastructure is going to be tremendous. Rep. Lowenthal has taken the position of Chair of the Safe Climate Caucus, which addresses how we will educate ourselves and others about the impacts of climate change and emphasize the need to develop a rational plan for the future. Rep. Lowenthal is also on the House Natural Resources Committee and is a Ranking Member on the Subcommittee on Energy and Minerals, which has proven to be a great learning experience. This Committee is tackling the contentious issue of balancing responsible land use with resource development. He noted that the US is

already falling behind on infrastructure and if the nation did not have the input and strategic planning from advisory groups like the HSRP, we would be in very serious trouble

Chair Perkins asked Rep. Lowenthal to discuss the Freight Infrastructure Reinvestment legislation that he has been developing. Rep. Lowenthal provided some background on the bill and the strides California has made on how to operate ports more efficiently, more cleanly, with longer operating hours, and how it has improved relationships between the ports and the surrounding communities. Economic development and environmental protection go hand-in-hand and share common goals. The governor of California vetoed Lowenthal's bill that attempted to balance economic development of the ports with regional planning because it was felt that the container fee would put California at a competitive disadvantage. Today, there is significant momentum around the need to redesign the freight system and this bill proposes designing one based on the input of public and private agencies, where funding goes to states on a competitive basis and on a formula basis. The bill seeks to encourage regionalization and encourage environmental protection, paid for with a one percent fee on the owners of the goods being moved throughout the nation. This will generate about $8 million a year to be put into a trust fund helping to create a sustainable funding stream for trade infrastructure. There is not yet a Senate companion bill but that will be essential.

Chair Perkins asked if the bill's use of the word "infrastructure" includes foundational information such as water elevations, positions of the shoreline, and the contours of the land. Rep. Lowenthal said that if it doesn't include those elements, it should. He will consult with his staff on how it is defined and would entertain working with the HSRP because of how critical it is to have that information.

Vice Chair Hanson commented that most coastal issues are resolved with supplemental emergency appropriations, which is not a tenable way to manage an infrastructure system. A Coastal Communities Caucus has been formed in Congress that is attempting to draw attention to the national interest of coastal issues. He asked what message Congress needs to hear from science and engineering to make the case that the nation needs a coastal policy and coastal investment. Rep. Lowenthal thanked Vice Chair Hanson for informing him of the Coastal Communities Caucus and urged the HSRP to keep pressing the issue everywhere they go and providing education on the critical issues of sustainability, protection, multi-use, and partnerships.

Michael Christensen, Senior Executive Lead, Supply Chain Optimization, Port of Long Beach

Mr. Christensen began by thanking Rep. Lowenthal for his advocacy work over the years and said that the Port of Long Beach strongly supports his proposal for creating a sustainable funding stream for the infrastructure associated with the port.

The port industry is changing and the San Pedro Bay ports have been in the midst of a pretty significant crisis. The port complex moves nearly half of the country's containerized goods in and out of the US and, particularly in the past few months, they have been highly impacted by tremendous congestion caused by a number of issues. Even after labor issues were resolved, there are still many issues causing congestion. One of Mr. Christensen's duties is working with a broad reach of experts to address the issue. The Federal Maritime Commission has granted permission to the ports of Long Beach and LA to engage each other, opening a whole new level of discussion between the ports, to address the changes coming to international trade. Ship sizes make NOAA and HSRP's work even more essential to the safety and success of ports.

Recovery is an important component of resiliency. The $2 billion a day economic impact when the port is down after an event justifies large investment. Mr. Christensen discussed a proposal for the creation of an "energy island" for the ports composed of minigrids that could keep the ports functioning under any

energy condition. The Port of Long Beach will do everything possible to be good environmental stewards, but those efforts need to be guided by good science.

Member Kudrna asked how critical the relief provided from the Harbor Maintenance Trust Fund (HMTF) is to the Port of Long Beach. Mr. Christensen replied that it is very critical. The port carries the cost burden for much of the infrastructure beyond the port and there is currently no funding for infrastructure needs further down the supply chain on the road and rail systems. He is closely following the policy and funding that would come through Transportation Reauthorization and has worked to get other funding streams fixed, such as getting full spend from HMTF for channel maintenance and expanded uses. First and foremost, the country needs a freight policy in place and then sustainable funding streams can be developed.

Member Miller asked what changes need to be made to the Port of Long Beach in order to handle larger ships. Mr. Christensen responded that Long Beach is presently "big ship-ready." Most of its major terminals have sufficient depth, but it needs to be maintained. Maintaining the breakwater will also be essential.

Member Jeffress asked if he or Rep. Lowenthal had a strategy for engaging land-locked states in the discussion on the importance of the nation's ports. Mr. Christensen said the first step is education. Both ports have education components. Between the San Pedro Bay ports, economic impacts can be traced to every Congressional District in the country.

Member Kelly said that part of the problem carriers are facing within the port community with this type of a plan is that it creates undue burden on international containers. He also noted the lack of accountability in the HMTF. Mr. Christensen responded that the legislation does include a lock box preventing funds from being put towards any other use, but acknowledged that some of the details need to be worked out. The ports are holding forums to gather further input from stakeholders. They are also looking at the possibility of a bridge agreement with organizations like OCEMA.

Captain Jennifer F. Williams, Sector Commander, Sector Los Angeles-Long Beach, US Coast Guard

CAPT Williams discussed the LALB port complex, considered the busiest container port complex in the country, 8th busiest in the world. The government has great difficulty in keeping up with industry, which is why the HSRP's role is so critical in making sure the Agencies are doing what they need to do to ensure the integrity of the maritime industry that we have. CAPT Williams area of responsibility stretches 350 miles along the coastline and 200 miles out. Activities of the sector revolve around marine safety, marine security, and environmental stewardship. She discussed counterdrug and migrant interdiction activities, working with local law enforcement and other partners. Sector LALB through a private partnership with Marine Exchange operates a vessel traffic system to manage the traffic going in and out. The Captain of the Port has the authority to prevent a ship from entering or leaving a port, as well as that ability to shut down a cargo facility. This authority would only be exercised under a major safety, security, or environmental threat.

CAPT Williams discussed NOAA's involvement in the operations of Sector LALB. The Harbor Safety Committee, which includes NOAA and operators, is tasked with planning safe navigation and operation of vessels in San Pedro Bay. NWS data is utilized in search and rescues, and is critical in determining how units are dispatched and how long they are kept out. NOAA data was utilized in the development of the Area Contingency Plan for oil spill response.

Bigger ships and the opening of the Arctic could potentially create more congestion in the port. CAPT Williams discussed port congestion during the labor negotiations. At one time, 50 ships were at anchor

and contingency anchorages had to be created offshore. Cybersecurity is becoming an area of focus. A research and development team visited a number of ports and found that facilities and ships are not adequately protecting themselves.

Chair Perkins asked how the Coast Guard is looking to utilize new technology within her AOR (such as unmanned aerial vehicle platforms). CAPT Williams responded that those decisions are generally made at headquarter levels, but those technologies would allow her to be more effective in executing her mission. Counterdrug and migrant interdiction operations have employed new technologies, but more often Sector LALB combines its efforts with other Agencies that may have remote technologies.

Member Miller asked if LA/Long Beach has experienced the same inability for efficient cost sharing among Agencies that the Panel has heard about in other regions. CAPT Williams said it is the same everywhere and that, generally, with natural disasters they can get the funding; if it's a man-made event, they look to the responsible party to pay.

Member Barbor asked if CAPT Williams was aware of any hydrographic or navigation inadequacies that need to be addressed for recreational boaters or around Seal Beach. CAPT Williams said she has not heard of recreational vessels complaining to the Coast Guard, but assumes those concerns would have been addressed to local Harbor Masters. The Navy would be the one to address Seal Beach issues.

Member Barbor asked if virtual aids to navigation is an issue that has arisen in her area. CAPT Williams replied that virtual aids for navigation have been beta tested in San Francisco's eNAV system. From what she's heard, it has been successful; deep draft vessel mariners like it but recreational users tend to prefer physical landmarks. Visual aids cost the Coast Guard money to maintain. If eNAV can be employed without elevated casualty rates, that's the best way to go but there will always be a population that need visual aids as well.

Member Rassello asked about the role of Coast Guard in the transition into eNAV. CAPT Williams said Coast Guard Headquarters has a Waterways Directorate that is considering pushing and testing virtual aids throughout various parts of the country. The vulnerability of eNAV's cyber component is something that really needs to be addressed.

Coastal Resilience and Improving Marine Navigation

Dr. Russell Callender, NOS Acting Assistant Administrator

Dr. Callender discussed how foundational data supports coastal resilience and improves marine navigation. NOS looks to build on the strong recommendations that HSRP provided at its previous meeting and explore strategies moving forward. It was very clear from the President's 2016 Budget Request that resilience is a high priority. As the concept continues to gain momentum in Congress, how can NOS better integrate resilience with its mission?

The key message that needs to get through is that the foundational data NOAA provides is critical to inform, build, and support community resilience. Resilience is used to mean the ability to prepare, respond, recover, and adapt to disruptions due to challenging conditions. NOAA conceived of resilience in three fundamental dimensions: Ecological, social, and economic aspects. Community resilience is dynamic and coastal decision makers are requesting NOAA's support for monitoring and tracking changing conditions through resilience indicators and climate outlooks. Clearly, Navigation, Observations, and Positioning programs provide coastal intelligence that support resilience in coastal communities as well as resilience of marine transportation infrastructure. Framework data, including datums and water level information, are needed to build tools for decision making.

Dr. Callender seeks HSRP's help in connecting more effectively NOAA's core mission with resiliency and communicating that message. He noted that the importance of tying resilience to shallow water bathymetry came through very clearly in the HSRP's recommendations. Dr. Callender has met with Lt. Gen. Bostick, USACE Commanding General, who is interested in making additional connections with NOAA on resilience. There is commitment from both Agencies to continue that dialogue on a more routine basis and there could be an opportunity for the Panel to influence that conversation.

Dr. Callender discussed NGS' Gravity for the Redefinition of the American Vertical Datum (GRAV-D) project to create new vertical datum by 2022. Completion of the GRAV-D project will allow surveyors, scientists, and others to employ GPS to determine more accurate and precise elevations than are currently possible. Estimated economic benefits of the project range from $522 million annually, with an estimated $240 million saved from improved floodplain mapping alone. NGS was able to upgrade its LIDAR capacity and capability of the topobathy system with Sandy Supplemental Funding, which also allowed for contracting of data collection. This provides seamless coverage between shoreline and shallow water. Foundation CORS (Continuously Operating Reference Stations) are needed to better connect the National Spatial Reference System to the International Terrestrial Reference Frame. To support future requirement and to prepare for the transition to the new datums, NGS is establishing a small number of ultrastable foundation CORS (1 or 2 per year, minimum of 8 stations in continental US with additional sites constructed in AK, HI, US Territories, and select foreign countries).

There is a great need for more comprehensive and up-to-date navigational services to help larger ships safely enter ports and deliver their cargo. Dr. Callender discussed the Precision Navigation project that is currently underway in the Long Beach area. Precision Navigation is the ability to improve navigation in four dimensions (X, Y, and Z coordinates as well as time). Ultimately, this will help us understand the decisions that mariners are trying to make, how they are accessing NOAA navigation and positioning information, and whether or not this information is meeting their needs. It is a great example of partnering at multiple levels, leveraging data and expertise. The development of the data stream is going to fuel an under keel decision support tool and improve the decision context of the Precision Navigation systems.

Work in the Arctic remains a priority for the Administration. NOAA is faced with the difficult challenge of balancing the needs for enhanced navigation in the Arctic and other competing priorities in the rest of the US. There is growing demand for surveys and water level information in the Arctic and it is essential that the work be carefully prioritized given the limited resources. As a start, one new gauge is being added and NOAA is looking to develop and employ new technologies, such as GPS tide buoys, to better inform hydrosurveys in Arctic waters. NOAA ships will be employed on a multiyear project with the Coast Guard that will survey areas for the planned Arctic Transfer Route.

Dr. Callender posed six questions to the Panel to consider in its deliberations:

- How does coastal intelligence enhance and make coastal resilience better?
- How do we leverage Ocean Service foundational data moving forward supporting resilience?
- What criteria should we consider in determining national charting priorities and balancing the needs of maritime users with the needs for coastal bathymetry?
- What criteria should we consider in determining charting priorities in the US Arctic? How do we balance those needs with other charting priorities in the US?
- What are the ways we are good at engaging stakeholders and in what ways could we better connect with those stakeholders?
- What are the criteria we need to consider when we select the next ports for Precision Navigation efforts and how do we prioritize that?

Chair Perkins asked about the difficulties in getting an MOA in place with USACE, and what HSRP can do collectively. Two years to get that contractual agreement in place is unacceptable for both sides of the table and real surveying needs are not being met because it is not in place. Dr. Callender agreed that is has taken too long and it has been a real struggle. Leadership from both Agencies realizes there is a need for enhanced coordination and Dr. Callender is committed to doing what he can to move this through.

Member Miller asked Dr. Callender to expound upon Appendix 1 NOAA's FY2016 Budget Blue Book which includes language on cost recovery. The budget also included a paragraph on availability for new vessel construction funds, which sounds encouraging. Mr. Boledovich responded that Appropriations bills of the past few years have included language about who NOS can talk to, or exchange money with. In terms of agreements that we have, it authorizes the scope of those and broadens it across the Agency instead of program by program. It has been a great help in terms of the ability to enter into agreements with other entities. Member Miller asked how that affects regional partnerships. Mr. Boledovich said that it means NOS has clear authority to enter into those agreements and to exchange resources. It broadens fairly strict rules about what a federal Agency can do. Dr. Callender added that it is basically language that would be put into a funding instrument. It doesn't speed up an MOU, it provides additional authority on top of the Economy Act.

Member Jeffress responded to Dr. Callender's question on what it is NOAA does well by saying that the core of what NOAA does, and NOS in particular, is providing great data and information that is scientifically rigorous and accepted by the courts. He recommended getting closer to users by integrating high-integrity scientific data into smartphone apps in a way that the public can understand and incorporating a social component where users can provide real time feedback on conditions they experience. Dr. Callender responded that finding the balance between providing authoritative data that meets rigorous standards and a smartphone application are keys. This is probably the direction NOAA is moving but it needs to be done in a way that stimulates private industry.

Member Brigham commented that the Panel will help provide assistance in criteria for setting priorities between projects, but noted that there has to be new money for addressing Arctic priorities. Dr. Callender said it is hugely difficult and expensive to operate ships in the Arctic. There's been some frustration with national-level priorities that clearly pointing towards the Arctic but requests to the President's budget office don't yield funding for the Arctic. He recommended putting a proposal together and taking it to the Hill. Member Brigham responded that there seems to be an assumption that they are talking about global trade routes decades from now rather than the needs of the present and near-term Arctic operations.

Member Barbor pointed out the Panel's recommendations have shifted towards a strategic view and the Members are wrestling with how to manage those sorts of recommendations. It's an internal issue that the Panel needs to come to grips with, but it is also an external issue that the Panel and the Agency need to be on the same page. Dr. Callender agreed and said that it points to the need for a continuous feedback loop.

Member Miller asked about NOAA vessel days at sea and the lack of hydrographic training being provided for the crews when ships don't sail. How can NOS push to get ships deployed reliably? Dr. Callender said they lost about 40% of their hydrodays this year. One of the fundamental challenges was the inability to keep engineers onboard the ships because the private sector offers better pay, schedules, berths, etc. That's not something NOS can control. Getting ships out there to do the work is one the challenges of operating this fleet. Training aspects are something that could be looked at for an action.

FY15 Appropriations, FY16 Budget Plan and Legislative Update

Glenn Boledovich, Chief, NOS Policy and Constituent Affairs Division

Mr. Boledovich discussed the Committee realignments, jurisdictions, and key members in the 114th Congress. He provided updates on the Appropriations Committees in the House and Senate and House Authorizing Committees and its Subcommittees. Based on releases provided, the Oversight & Investigations Subcommittee have identified priorities including the CZMA, federal mapping programs, and National Ocean Policy. NOS' programs fall under the Water, Power & Oceans Subcommittee. This Congress has not shown much interest in the HSIA reauthorization. The Transportation & Infrastructure Committee and its Subcommittees always have interest in NOS programs but have no official jurisdiction over hydrographic services. It is not yet clear where the Senate Commerce, Science, & Transportation Committee and its Subcommittee will be focusing their attention, but they have stated interest in the areas of vessel discharge, weather legislation, and fisheries.

Mr. Boledovich provided an outline of the Congressional legislation that governs and provides jurisdiction for the HSRP. As far as legislation that may come up in this Congress, HSRP members were invited to contact Mr. Boledovich's office and they will help track any bills they may have an interest in. The Geospatial Data Act was introduced March 16, but may not move very far. The Digital Coast Act did not pass the previous Congress and is expected to be introduced again. NOS' Congressional outreach strategies are designed to strengthen existing relationships and build new relationships/gain new supporters.

NOS is about 10% of NOAA's overall budget. There was a significant increase in FY16's budget which did not translate to increases in procurement, acquisition, and construction programs. Those increases are very relevant to resilience. Sequestration will be returning in FY16, so whatever Congress does with the President's budget, there will be additional reductions unless relief is provided from the sequester. The investments in NOS are virtually all in the area of resilience. The President made a deliberate push in this area consistent with the White House Climate Adaptation Strategies and Climate Action Program. $45 million was put into NOS' budget for regional coastal resilience grants. Other areas that have proposed increase are: coastal zone management and services, competitive research, and coastal science, response, and restoration. It would be very helpful if HSRP could better articulate how Nav, Obs, and Positioning programs can advance the national goals of increasing coastal resiliency.

NOS has prepared some Pre-Scripted Mission Assignments (PSMA) and taken them to FEMA with mixed success. One (Coastal Adviser) has been approved; five others (hydrography, LIDAR/aerial mapping, geodesy, oil spill science, and marine debris) are pending. FEMA has limited them to DFA (Direct Federal Assistance), meaning the state has to request the assistance and be willing to do cost sharing. Despite some concerns, NOS is going to take what it can get. The goal is to have these PSMAs in place by hurricane season this year.

HSRP's charter expires September 6, 2015. Renewal is an administrative process led by the DFO. The HSRP has no formal role in reauthorization, but it is an opportunity for the Panel to provide its views to the DFO. One issue that has come up is Subcommittee jurisdiction under Section 11.

Chair Perkins congratulated Mr. Boledovich for the progress made on PSMAs and asked him not to let up. A strategy is needed for getting support from NWS, from FEMA at the regional level, and from State Emergency Response. Mr. Boledovich said there is support all the way up the leadership chains on both sides and they will continue to work on it. A regional outreach strategy is the next step after the PSMAs are in place.

Vice Chair Hanson asked Mr. Boledovich to comment on how NOS relates to states and what kind of outreach they have with them. Mr. Boledovich responded that the Coast States Organization, made up of all the states that are part of the Coastal Zone Management Program, is a key outreach organization for NOS. Dr. Callender added that they have been active with the NERRS Association as well as enhancing the relationship with the Sea Grant Program. NOS has focused on major organizations that have

representation at state and federal levels. Vice Chair Hanson suggested reaching out to American Shore and Beach and the National Governor's Association.

Member Kudrna asked Mr. Boledovich to comment on the HSRP's intention to craft a document that specifically addresses the issues of the Panel; whether he felt that would be effective. Mr. Boledovich said that he thought the HSRP's Top Most Wanted List was a very valuable tool and having a document from the Panel conveying its message is very effective when NOS meets with Congress.

Member Shingledecker asked who the HSRP can and should be messaging to in addition to the Administrator and in what form would it be most effective. Mr. Boledovich suggested that the HSRP get the information out and to leave the messaging to NOS. The Panel taking an active role in conducting outreach is a question that the lawyers need to resolve, but it is very helpful to have a group of esteemed scientists and experts articulate the needs of the Agency.

Chair Perkins asked if it would be possible to get an assessment of which recommendations in the two Top Ten Lists have been enacted. Mr. Boledovich said he could look into it, but it can sometimes be very difficult to trace recommendations to a result. He could confirm that the recommendations have led to sustained support for certain programs, such as the PORTS system.

National Ocean Service Program Updates

Peter Stone, Technical Director, Center for Operational Oceanographic Products and Services

Mr. Stone passed along Rich Edwing's regrets at not being able to attend the meeting. Mr. Stone discussed the four strategic goals of CO-OPS' 5-year Strategic Plan and how they will be addressed in the upcoming year:

- Customer service
    - Top down review of their website and service delivery analytics
    - Water level training modules to aid in tech transfer to partners
    - Expansion of collaboration with NOAA Data Center for archiving and product development
- Integrated observing system
    - PORTS coming online at four new facilities (Port Fouchon, Morgan City, Savannah, and Matagorda Bay)
    - Observing system partnerships with NWS, NERRS, USGS, and NPS
    - Start MWWL infusion – 10 stations scheduled for FY15
    - Arctic Bottom Mounted Pressure System
- Advanced products and services
    - Upgrade of Lake Erie Operational Forecast System
    - Dissemination of hydrodynamic model guidance from external partners
    - Tampa Bay Marine Channel forecasts
    - IGLD and Tidal Datum Epoch updates
    - NOAA rip current forecast support
    - Coastal Inundation Dashboard (Hampton Roads)
    - Landmark Inundation Network (New York City)
- Human Capital and infrastructure
    - Implement Organizational Health Survey Action Plan
    - Complete CO-OPS University
    - Complete RIAC (Re-engineering the Information Architecture within CO-OPS)
    - GIS Architectural Framework
    - Redesign web services to facilitate exchange of data between partners

Juliana Blackwell, Director, National Geodetic Survey

Ms. Blackwell presented some of NGS' activities in support of the 10-year Strategic Plan. The five goals of the 10-year Strategic Plan are:

- Support the users of the National Spatial Reference System (NSRS)
- Modernize and improve the NSRS
- Expand the NSRS stakeholder base through partnerships, education, and outreach
- Develop and enable a workforce with a supportive environment
- Improve organizational and administrative functionality

One of the signature outcomes of the NGS 10-year plan is the release of new geometric and geopotential datums in 2022, replacing NAVD 88 and NAD 83. The realization of the new datums will be through GNSS receivers which incorporate GPS, GLONASS, Galileo, and other positioning systems. Stakeholders urged NGS to ensure they provide the tools to easily transform between the new and old datums. The new geometric datum will change latitude, longitude, and ellipsoid height by 1-2m; the new geopotential datum will change heights an average of 50cm, with a one meter tilt towards the Pacific Northwest. Preparing users for the transition is one of NGS' major outreach goals over the next few years. NGS has created short YouTube videos that discuss geodetic datums.

Member Blackwell discussed the scientific geodesy work that is being performed around the GRAV-D project, collecting gravity data to redefine the US vertical datum. The target is to have a 2cm accuracy relative to sea level using GPS/GNSS and a geoid model. Collecting GRAV-D data for California is a priority. In 2014, NGS released the best available experimental geoid using aerogravity collected through GRAV-D to demonstrate the magnitude of the changes. She briefly discussed NGS' activities related to Foundation CORS and NGS' efforts with CO-OPS to coordinate International Great Lakes Datum (IGLD). The VDatum tool for converting elevation data between different vertical datums, is continuously being modernized and updated. An update for the entire West Coast Model will be released in 2019. Partnerships for this effort include FEMA, USACE, USGS, and NGIA.

Since July 2014, NGS has hired 11 employees: six Geodesists, two Physical Scientists, and three IT Specialists. Ten more Geodesists recruits are expected to be onboard in the next few months. NGS has also introduced a workforce development opportunity to send current employees to Ohio State University for full-time training for a non-thesis Master of Science degree in Geodetic Science. NGS' Geodetic Advisor Program is transitioning to a regional approach, meaning more coverage but fewer advisors.

RDML Gerd F. Glang, Director, Office of Coast Survey

RDML Glang's focused his presentation on activities for 2015. NOS has performance measures with GPRA (Government Performance and Results Act) goals and AOP. These measures include:

- Reduce the Hydrographic Survey Backlog within navigationally significant areas, with a FY15 target of 2,556 SNM
- Acquire approximately 420 SNM of hydrography in the Arctic (using NOAA hydrographic ships and hydrographic services contracts)
- Process 110 hydrographic surveys to support nautical chart products and other users, and make the data available via NGDC
- Perform chart validation in 11 (6%) of the top 175 US seaports with access to a suite of NOAA navigation products and services

All of the hydrographic survey plans are available to the public via an ESRI Story Map.

RDML Glang discussed the significant impact of transitioning to ENC First. Part of that effort is keyed around building out a database for chart products. California, Hawaii, and Puerto Rico are loaded and are being maintained in the new Nautical Information System; Alaska and Oregon are currently being loaded. Publishing ENCs is followed publishing the RNCs and it is important to keep those as carefully synchronized as possible. Personnel retraining is underway to familiarize people with ENC compilation.

Two new boats for the Navigation Response Teams are expected to be delivered in early May and field tested by July. OCS has been very active in its leadership role on the International Hydrographic Organization (IHO). They had the opportunity to engage in a bilateral discussion with Cuba and a delegation was sent there for the first time in 50 years to discuss specifics of how to improve navigation in the waters between the US and Cuba.

There are a variety of efforts on autonomous technologies, including a multi-year effort to integrate the Remus 600 AUV into the operation of NOAA's SWATH vessel, Ferdinand R. Hasseler. Researchers have shown that the data being collected from this can meet charting standards.

Navigation Managers are doing an excellent job recognizing that external partnerships are now a focus and acquiring more external data through partnerships.

An MOA with USACE has been drafted. It is RDML Glang's goal to have it submitted to NOS by the end of May. He is working with other parts of NOS to explore other partnering opportunities.

Due to time constraints, a Committee of the Whole will convene via webinar to receive the presentations of the Tri-Service Directors in full. The presentations are also available on the HSRP website.

Public Comment

CAPT Jeff Cowan, State of California Office of Oil Spill Prevention and Response, expressed his concern with the overreliance on GPS. GPS can be compromised and the US has no back-up system in place. He proposed utilizing eLORAN along with GPS and asked where NOAA stands on eLORAN. Chair Perkins responded that he and RDML Glang provided testimony to the House Subcommittee on Transportation on funding eLORAN. Congressman Hunter has included in his Appropriations request $1.5 million to jumpstart an eLORAN continuity program. RDML Glang emphasized that mariners should not rely on one positioning source alone and alternatives to GPS are necessary for safe navigation. Ms. Blackwell said there is a lot of concern about not having a backup system. If one visits GPS.gov, there is a list of the efforts underway in support of GPS and the activities across federal Agencies. There is an opportunity for NOS programs to provide feedback on issues posed by the Office of Space-Based Positioning, Navigation, and Timing and to all federal Agencies. NGS stays engaged in the variety of issues related to GPS and alternate systems but she said that commenting on behalf of NOAA would not be appropriate at this time.

Adjournment

The meeting was adjourned at 12:33 p.m.

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Thursday, April 9, 2015

The meeting was called to order at 8:35 a.m.

Chair Perkins welcomed everyone to day two of the meeting and briefly reviewed the previous day's sessions and site visits to the Marine Exchange and Port of Los Angeles.

A draft HSRP charter was distributed to the Panel members. Member Kudrna noted that NOAA has provided clarity that the HSRP working groups are allowed to solicit input from outside individuals but the statute does not allow them to be voting members. The HSRP voted unanimously to approve the charter.

The HSRP also voted unanimously to approve the minutes of the September 2014 HSRP meeting as amended.

NOAA Precision Navigation Project for Long Beach Panel

Captain Richard Brennan, Chief, Coast Survey Development Laboratory, Office of Coast Survey

CAPT Brennan discussed Precision Navigation and the demand for coastal intelligence. Precision Navigation is going to mean different things in different ports as they face handling larger vessels. Decision support relies on gridded bathymetry, along with direct observation and forecast models for water level, wind, wave, salinity, and current. The PROTIDE tool is able to take all of that data and synthesize it into a solution that allows vessels to operate in close proximity to whatever their danger is. PROTIDE provides an analysis of the motion of a ship coupled with all of the environmental observations and derives a statistical probability of grounding for the port's decision making. It produces a visual diagram for when it is statistically considered safe to bring a particular ship into port. OCS is currently working with PROTIDE on validating the models.

PROTIDE's report for LA/Long Beach shows that 41% of their water levels are greater than one meter. If the port doesn't account for that, it would be missing a window of opportunity to load according to the tide; every inch of draft has financial implications to the port. Observations alone are not good enough for water levels; models are needed for forecasting all of the driving conditions. This project seeks to get weather information to mariners in an easily ingestible format to enable them to overlay the information in a GIS-type fashion to aid in making well-informed decisions.

NOAA's commitment to LA/Long Beach includes:

- Creating a 500 meter resolution Nearshore Wave Prediction System (NWPS)
- Operationalizing high-resolution bathymetry database for five years
- Providing prototype high-resolution navigational products to pilots for evaluation
- Providing prototype visualization tools to assist ports in decision support

CAPT Brennan provided a live demonstration of the capabilities of PROTIDE. The intended outcomes of the tool include:

- Gain operational experience maintaining a gridded bathymetry database and producing products from it
- Opportunity to educate mariners on the benefits of high-resolution data and its fusion with meteorological and oceanographic data

- Encourage the use of the S-100 standards and gain practical experience creating products in this standard

CAPT Brennan concluded his presentation with the following questions for the Panel to consider:

- How will high-accuracy GPS positioning change maritime navigation, particularly with respect to vertical positioning?
- How do we transform the collected data into information, then knowledge, and ultimately wisdom for decision making?
- How do we support 24/7 operations in our ports?
- How do we support deeper drafts and reduce under keel clearance?
- How must products change to support the demand for precision?

Julie Thomas, Executive Director, Southern California Coastal Ocean Observing System (SCCOOS), Scripps Institute of Oceanography

Ms. Thomas discussed the activities of SCCOOS and why validation is important. SCCOOS is one of IOOS' 11 regional ocean observing systems in the US. It employs HF Radar, gliders, shore stations, and leverages programs through the CDIP wave network. In 2004, the State of California invested $21 million into HF Radar in the state, primarily because of the potential for oil spills offshore. SCCOOS maintains a Cooperative Agreement between USACE and the State of California funding CDIP (Coastal Data Information Program). They currently have a network of 62 buoys throughout the coastal US that provide data to the NOAA network.

Ms. Thomas discussed some of the difficulties of modeling in Southern California. She stressed the importance of model validation and that the accuracy of under keel clearance is critical for human and vessel safety. She discussed the data collection points around the San Pedro Bay that are being fed into PROTIDE. The Global Pacific Wavewatch model has been running out of NCEP for years now. Conducting comparisons between San Pedro Buoy observation and Wavewatch 3 Model Predictions have often demonstrated a difference of at least 1ft between the two.

John Z. Strong, Vice President, Jacobsen Pilot Service, Long Beach, CA

Captain Strong discussed mega ships and the dynamic under keel clearance project at the Port of Long Beach. It's been a slow evolution as terminals and pilots become capable of handling larger and larger ships, both aided by enhanced tools that have become available. As ships continue to get larger, it has become necessary to establish a safety limit and develop guidelines on how big is too big. He provided a history of how Jacobsen Pilots began investigating what kinds of technologies were available to help the port take advantage of the data that's available. They installed air gap sensors and worked with the port to get soundings and inputting that information into navigation units. Technology has allowed pilots to utilize the inner harbor much more than before. Jacobsen Pilot's present method for determining Go/No Go consists of:

- CDIP/SCOOS Swell Warnings
- Experience
- Seaman's Eye

- Observed pitch and roll far enough offshore to permit "bail-out" before committing to channel

Mr. Strong felt it the under keel clearance project should start with VLCC's and ULCCs first, then expand the project to other critical areas of the port. Inside the breakwater, it just gets increasingly complex.

HSRP Q&A with Speaker Panel

Member Miller asked what the Port of Long Beach's plan was for the PROTIDE system in terms of sustainable funding. Captain Strong said that, from a pilot's perspective, this is all customer-driven. The pilots are saying "If you want us to take this size a ship to this size a berth, this is the information we need." Funding will hopefully come from a partnership with the oil companies, otherwise everything stops and big ships don't come in.

Member Kudrna said he was surprised to find that there were still ships under anchor backlogged from the strike, and there are obviously economic consequences to that. Is it purely a labor issue or could some technology improve the ability to clear that system out? Captain Strong responded that he thinks it is purely a labor issue and added that many of them are new arrivals that have been waiting outside of the air quality zone for a long time.

Chair Perkins asked CAPT Brennan at what frequency are you going to have to resurvey this area to maintain an accurate data set to support this Precision Navigation and PROTIDE approach. CAPT Brennan responded that the hope is that beginning to monitor it at that level is what it's going to take. It is a federally maintained channel so it would fall under USACE's jurisdiction. As we navigate closer to the bottom it should bring that into sharper focus. Member Jeffress asked why hydrographic instrumentation is not put on pilot boats to collect data on a daily basis. Member Armstrong said it's not a technology issue, but a process, expertise, and personnel issue in terms of installing and maintaining the equipment, processing the data, keeping track of all the corrections, etc.

Member Lockhart asked if a goal is in mind for what "rapidly" means in "rapidly updating the database." CAPT Brennan pointed to Rotterdam, where the database is updated every night. Though the operation is smaller and run differently, it shows what is possible. Two weeks seems reasonable right now, but there are several issues that need to be determined.

Chair Perkins asked if real-time bottom measurement from autonomous systems is needed to complement PORTS' real-time air gap capability. Captain Strong said it might be in areas where shoaling is an issue, but probably not at LA/Long Beach.

Member Jeffress asked Ms. Thomas to discuss how Scripps was able to get their cooperative agreement in place with USACE and what part of USACE it comes from. Ms. Thomas discussed the stages of getting the CA in place and the shifting sources of funding. All of their USACE funding is centered in ERDC under a CODS (Coastal Ocean Data Services) President's budget; an O&M line item through the Corps' dredging budget. Since 1985, all of the Corps funds have been routed through the state but they recently developed a cooperative agreement with USACE directly.

Member Armstrong said universities have the advantage of a lot of oceanographic and marine geology scientific understanding, and it would seem there is some potential gain from interaction with charting agencies and the scientists who understand regionally the things that might affect Precision Navigation in a certain area. Ms. Thomas said she is asked regularly why NOAA doesn't manage the buoys. The accuracy and real-time quality control on these systems is what has kept this program at Scripps. People have realized that the academic-federal partnership works really well there. She advocates for programs that come through academia because they can be operational 24/7 and have exceptional reliability.

Southern California Regional Stakeholder Panel

Jeff Ferguson, OCS Navigation Services Division, California Navigation Manager

Mr. Ferguson provided an overview of the OCS Navigation Services Division and his territory, the State of California, in particular. He discussed the various jurisdictions around the San Pedro Bay; USACE performs hydrographic surveys and sends the data to OCS to update charts. The ports also send data, though there is a need to reduce friction points on that flow. The NOAA Ship Fairweather conducted a shore-to-shore survey of the ports in 2013. The preliminary ENC from that survey has been shared with stakeholders in the area. The official ENC should be released in a week or two, followed by the raster and POD products. Mr. Ferguson presented AIS data and traffic flows for the area. In 2009, the State of California implemented low sulfur fuel regulations within 24 miles of the coast. It is now a federal requirement for 200 miles offshore. We are still waiting to see how that will affect traffic patterns; there may be bigger vessels staying closer to shore because of those regulation changes.

LA/Long Beach's public-private partnership works very well for funding PORTS. Other California ports, like Port Hueneme and San Francisco, are having trouble with the private side. There is a great consortium of CDIP and NOAA buoys that inform the NBDC, but there are communication issues regarding the temporary nature of special project buoys.

California has a robust coastal marine sanctuaries system that is about to get much larger. Mr. Ferguson discussed the voluntary speed reduction (VSR) program. The Santa Barbara County Air Quality Board extended the program for ships to stay at 12 knots or less all the way through the Santa Barbara Channel. Complying ships would receive a $2500 incentive check and public recognition for participating in the VSR Program. Several companies are enrolled in the program.

Tom Cullen, Administrator, State of California, Office of Spill Prevention and Response (OSPR)

Mr. Cullen gave an overview of how OSPR works to protect the state's surface waters, particularly in drought conditions, as well as their relationship with the California's five Harbor Safety Committees. OSPR is the lead state agency for oil spill prevention and response in California. Their mission is to provide the best achievable protection of California's natural resources by preventing, preparing for, and responding to spills of oil and other deleterious materials, and by restoring and enhancing affected resources. Any entity that moves significant volumes of oil in the state is required to have a contingency plan and regularly demonstrate their financial responsibility. OSPR conducts dozens of drills and exercises every year. They are expanded from being a maritime-only organization to inland preparing for spills resulting from an increase in crude by rail and pipelines coming from the Bakken formation and Canadian tar sands. Senate Bill 861 expanded OSPR's responsibilities to cover all state waters and they

are now assessing fees at refineries. OSPR staff is going to grow from 250 to 300 people, made up mostly of law enforcement wardens, environmental scientists, and GIS technicians.

Mr. Cullen discussed the elements of the Incident Command System and the responsibilities of each party. OSPR's Shoreline Clean-up Assessment Teams rely heavily on NOAA/UNH's ERMA (Environmental Response Management Application) tool.

The OSPR Administrator is responsible for evaluating all pilotage areas in the state and establishing and overseeing five Harbor Safety Committees, which provide recommendations to the Administrator for safe navigation. Mr. Cullen presented some of the topics the HSCs are currently working on.

Jim Haussener, Executive Director, California Marine Affairs and Navigation Conference (CMANC)

Mr. Haussener discussed the role of CMANC representing all of California's ports and harbors that have navigation projects. California is unique in that it does not have a state port agency. About 40% of America's maritime trade by dollar goes through California. California's ports create 1.6 million jobs and $30 billion in personal income and federal tax revenues. The state's ports are investing heavily in their infrastructure, but they don't have the processes or the innovations to make the supply chain work well. Costs are the main driver. California has the highest cost per container in North America. Bringing in more containers is one way to address that. From 2006-2013, container growth in the US grew by less than .5%; container growth in Canada grew by 25% and in Mexico by 80% (Mexico is not part of the low sulfur ecosystem). The US needs partnership and collaboration to achieve the high environmental standards while increasing container throughput.

The surveying community should look at risk and determine if such high-resolution surveys are needed in every case. Are we making it so complex that costs are rising and the number of surveys across the country is declining? Mr. Haussener encouraged NOAA to create standards so that crowdsourced data sets are compatible and made available to the public. Data integration provided by federal or private partners may allow for increased investment in things like PORTS, IOOS, or updating Coast Pilot.

Mr. Haussener commented on several of NOAA's products and said that he would like to see HF Radar integrated into a dashboard with NWS wind data and buoy data, that is customizable based on the user's needs. He emphasized the importance of maintaining the Coastal Buoy Network given that the West Coast does not have an Intracoastal Waterway or many harbors of refuge. Mr. Haussener expressed a concern that professional captains are becoming overly reliant on technology.

Coastal communities need a basic framework from NOAA on coastal resilience and intelligence. The State of California is providing grants to coastal communities and NOAA should be a partner in the assessments to ensure the communities can invest their limited resources appropriately to protect and adapt their communities.

National Response Teams are important to California but if there is statewide damage, Team 6 is not going to be able to handle the job. Work needs to be done with various partners to develop a plan for getting channels open again. Ten years ago, NOAA worked on the Coastal Storms Program for Southern California to improve coastal storm prediction, preparation, and recovery. After a five year effort and lots of great products, many Coastal Managers are unaware of it. This should be remedied. Mr. Haussener

concluded by stating for the record that CMANC is opposed to new or expanded sanctuaries due to a variety of issues.

Christopher Cannon, Director, Environmental Management, Port of Los Angeles

Mr. Cannon discussed the benefits of high quality hydrographic data for environmental uses. He provided an update on the congestion problems at the Port of LA, where they are making very good progress on the backlog. This has led to an increased interest in supply chain and goods movement efficiency.

Accurate hydrographic data are becoming more and more important for environmental uses. Water and sediment quality regulations are driving new modeling efforts. These improve planning for sustainable management of coastal zones and keeping track of pollution and other elements that are introduced into the marine environment. TMDLs (total maximum daily load), the maximum amount of contamination the water column can take before exceeding water quality standards, are particularly important for ports that have been in operation for a long time and have legacy contamination. TMDL regulations have made ports responsible as owners of the sediments. The challenge is determining how to comply without unnecessary dredging. The port is working with the Agencies to develop a model to better understand how all of the sediments and marine life interact and the potential impact it can have on water quality. LA Harbor modifications that need to be included in modeling efforts include:

- Landform modifications for business purposes
- Channel and berth deepening
- Construction of shallow water habitats
- Submerged sediment storage site

Mr. Cannon presented the 3-D hydrodynamic model for the harbor complex which incorporates water quality data, currents, erosion, shear stress, bottom bed consolidation, and movement of marine life. The goal is figuring out if and how sediment moves through the harbor and the extent to which contaminated sediments impact and bioaccumulate in marine life. Regulators have taken a keen interest in this tool as they make decisions about TMDLs and water quality.

Hydrodynamic/sediment transport models are only as good as the data inputs. Better models mean better prediction of sediment transport which would, hopefully, mean more efficient and effective management actions which could save the Port of LA nearly a billion dollars in costs. The model has also helped the port develop an ongoing relationship with their regulators.

HSRP Q&A with Speaker Panel

Chair Perkins asked Mr. Cannon where they are getting their benthic data from. Mr. Cannon said the port has a team that does sampling and analysis.

Member Maune asked for clarification on what "marine credits" refer to. Mr. Cannon responded that whenever a port impacts a habitat, regardless of the quality of it, it must be paid it back elsewhere.

Chair Perkins asked Mr. Haussener if he had an example of effective crowdsourcing technology that he could share with the Panel. Mr. Haussener replied one of the fathometer companies is developing

technology for their customers tying in the fathometer, chart plotter data, and GPS into one unit that send data back to their headquarters which is used to update their charts.

Vice Chair Hannon asked the panel about their outreach at the state level and to comment on California's budget for coastal issues and the long-term outlook. Mr. Haussener said there needs to be better communication across the port and out to users. California's maritime budget is dire: local ports have been paying to cost share on federal projects, gas tax revenues from boaters that are supposed to come back to boating projects end up in the general fund to the tune of about $35 million a year. California does have the cleanest trucks in the nation and has seen an 80% reduction in particulate matter and pollutants in port communities. Mr. Cullen said his office has expanded their focus to include inland areas but he has not seen a reduction in emphasis on coastal issues. They have a separate fund for fines collected from spills which funds wetland restoration projects. The challenge in the years to come will be the abandoned and derelict vessel threat.

HSRP Emerging Arctic Priorities Working Group

David Kennedy, NOAA Arctic Policy Advisor, Office of the Under Secretary

Mr. Kennedy discussed NOAA's activities in the Arctic. NOAA's had an Arctic Vision & Strategy for some time. As the National Strategy for the Arctic Region was developed last year, NOAA developed an implementation plan and aligned its strategic goals with the lines of effort in the National Strategy, particularly in the realm of stewardship. The National Strategy's lines of effort and NOAA's corresponding strategic goals are:

- Advance US security interests
    - Forecast sea ice
    - Improved weather and water forecasts and warnings
- Pursue responsible Arctic region stewardship
    - Strengthen foundational science to understand and detect Arctic climate and ecosystem changes
    - Improve stewardship and management of ocean and coastal resources in the Arctic
    - Advance resilient and healthy Arctic communities and economies
- Strengthen international cooperation
    - Enhance international and national partnerships

The majority of NOAA's effort falls under stewardship and management, in part because of the definition of Arctic which includes Bering Sea fisheries where NMFS has had a presence for a long time.

There has been considerable interest around domain awareness in security. There is little or no infrastructure around the Arctic or as much monitoring and intelligence ability as we would like. NOAA would like to assert itself as part of the environmental domain awareness – the backbone of the environmental data. There is a big move underway to make the lower 48 states aware of how significant Arctic issues are to the nation. Three themes have been identified as focus areas for the Arctic: Energy development, transportation & economics, and climate impacts. NOAA's role in each of these international drivers are principally weather and sea ice forecasting, improved understanding of climate impacts on biological resources, and navigation services. Mr. Kennedy discussed some of NOAA's

interagency and international work in the Arctic. NOAA is trying to ensure that it stays in the middle of the activity and make known the value they provide.

Dr. Lawson Brigham, Chair, HSRP Emerging Arctic Priorities Working Group

Member Brigham remarked that the US has the largest Arctic and Antarctic research budget, perhaps by as much as 10 times. He discussed some of the US' far-reaching presence in the Arctic. What is lacking is the development of Alaska's coastline and the natural resources of Alaska, along with the infrastructure to support it.

The only infrastructure issue that is addressed in the National Strategy is charting the Arctic region. Member Brigham believes that this should be NOAA's highest priority. In order to coordinate surveying, mapping, and charting the US Arctic waters, hydrography, shorelines, and topography, the Implementation Plan's next steps include:

- Complete acquisition of US Arctic elevation data and geoid model development
- Transition to Arctic water level gauge operations
- Increase public access to existing Arctic mapping data sets
- Increase percentage of Bering Strait surveyed and charted (for future IMO routing and rules)
- Increase percentage of potential US Arctic deep draft ports and harbors of refuge surveyed and charted
- Increase percentage of US Arctic with comprehensive topographic mapping tools

The IMO has developed a mandatory Polar Code to be rolled out in May with enforcement beginning January 1, 2017. The US will be implementing the Polar Code for the US Arctic through the Coast Guard. Currently, the US is one of few countries with no rules for its Arctic areas, but they will under this Polar Code. Though it won't apply to government ships initially, in the long-term government vessels will have to be in compliance. SOLAS and STCW amendments in the Polar Code address marine safety and MARPOL is amending annexes to address issues of environmental protections.

Member Brigham distributed a recent UAF study entitled *Alaska and the New Maritime Arctic*. Major findings of the study include:

- Arctic natural resource development is the primary driver of Arctic marine transportation
- Arctic shipping routes are unlikely to revolutionize the global shipping routes; will function as seasonal supplements to existing routes
- AMSA's 17 recommendations compare favorably with the US National Strategy for the Arctic Region themes and key issues
- IMO Mandatory Polar Code – Arctic-specific rules and regulations for the US maritime Arctic; in force January 1, 2017
- Maximum extent of winter ice edge in Bering Sea has not changed much in five decades; earlier seasons of navigation in spring are not anticipated
- Minimum Arctic sea ice extent has retreated dramatically in five decades; longer autumn operational seasons are anticipated for offshore drilling and coastal resupply

- Highly seasonal marine traffic in the Bering Strait Region with no traffic from December to May; key commercial traffic from June to November. There is a direct correlation to regional sea ice cover
- Offshore hydrocarbon activity is the most significant fact in marine operations in the US maritime Arctic for the next several decades. By 2025, the Chukchi Sea could plausibly have 100 support vessels (assuming eight platforms)
- Hydrography and charting in the US maritime Arctic are critical to safe navigation and facilitating coastal development of ports
- An Arctic port in western Alaska will be key to regional development, but it must be linked to natural resource exports and servicing the offshore hydrocarbon industry
- Seasonal increase in marine traffic along the NSR; no indicators that large numbers of commercial ships will use the NWP
- Key US maritime Arctic infrastructure needs: hydrography and charting; Arctic observing networks; marine domain awareness; Alaska deepwater port; SAR and environmental response capacity; polar and coastal icebreaking capacity; defined Arctic transportation corridors

The US is still using the Arctic Council's *Arctic Marine Shipping Assessment 2009 Report* for addressing the international issues of enhancing Arctic marine safety, protecting Arctic people and the environment, and building the Arctic marine infrastructure.

RDML Gerd F. Glang, Director, Office of Coast Survey

RDML Glang presented a risk-based methodology of assessing the adequacy of charting products in the Arctic region. He presented a graphic demonstrating the area of hydrographic data availability combined with a generalized bathymetry model. Confidence in the hydrographic data is separated into four categories: high, medium, low, unassessed. Surveys done with older equipment receive a lower confidence level assessment. The next step is to determine the depth and classify by shallow (0-20m), mid-depth (20-50m), and deep (>50m). Combining the areas of confidence with depth is done to generate five levels of concern. Kotzebue Sound has been identified as an area of highest concern because it is unassessed and shallow. Next, AIS vessel traffic is incorporated to determine priorities. Combining these inputs demonstrates the confidence levels where vessels have been operating. Arctic-wide, 23% of the vessels are operating in areas with medium, low, or unassessed confidence levels in chart data. 80% of US vessel traffic is operating in areas with higher confidence levels.

This tool can be employed in targeting surveys in heavily transited areas of high concern and developing offshore transit corridors. NOAA is partnering with the US Coast Guard to develop an offshore transit corridor between the Aleutian Islands and the Bering Strait. The vessels will be acquiring high-confidence track-line bathymetry. Good communications and partnerships have made this one of IOCM's success stories.

The AIS data was extracted from June 2012- July 2013. When the supposition is "retreating sea ice will lead to increased marine traffic," past navigations trends (while informative) are of limited value. But because it is input to a GIS, more complexity can be added.

Chair Perkins asked what it would take to formulate a cooperative trackline survey collection program from all of those vehicles in transit. RDML Glang responded that the short answer is resources. Building

relationships and doing some systems check-out would also be necessary. Ms. Chappell said that there are some opportunities that NOS is looking to develop further. The Arctic is being used as a demonstration project for a trackline selection tool.

Dr. Larry Mayer said he is concerned about the temporal changes and asked how they are captured. He expressed concern that the seafloor may be labeled simple at one time but not be so simple the next. RDML Glang has asked that ships surveying Kotzebue Sound and Nome do some reconnaissance lines over the work done in 2012. Coastal processes also need to be looked at to direct us to where change is happening more rapidly. Dr. Mayer agreed and said it may be a good place for satellite-derived bathymetry once a baseline is established. Member Brigham said that what is needed is to roll UNOLS new ship, Sikuliaq, into this program. Member Armstrong said UNH has been helping to get Sikuliaq's multibeam set up and that they definitely want to maintain that relationship in order to continue getting data from the good systems that are on-board.

RDML Glang commented on how he sees OCS' priorities in enabling crowdsourced or volunteer-observed data. Several vendors are creating closed ecosystems for their customers. NOAA is trying to approach the vendors in a broader sense and build those relationships. On the back end, NOAA is investing time and effort developing through the IHO a global bathymetric database. They are recording crowdsourced data for the whole globe. On the front end, IHO is working on a pilot project with the Professional Yachting Association for rules of behavior – how to log the data, what metadata goes into it, etc. The next step will be to bring in experts to establish standards for what crowdsourced bathymetry might look like.

Vice Chair Hanson asked if there is a planned schedule for getting the rest of the data. RDML Glang said the 2015 plan becomes the 2016 plan, unless things get done more quickly. Those survey areas much larger than what we anticipate getting done in one year, but there are plans for the future. A five-year plan using this methodology has not been developed. One of the things the Panel is being asked is what kind of criteria should be considered for how much gets done in a particular season in the Arctic, given limited resources.

Timothy Smith asked if anyone could speak about managing the lack of the bathymetry on the river systems in western Alaska and what the methods are for approaching the dynamic nature of the river systems from a charting perspective. RDML Glang said that a tug operator came to the HSRP meeting in Anchorage and made their point very strongly that NOAA's not paying enough attention to charting those rivers which can be extremely tidal and have highly varying bathymetry. This is part of the question going to the Working Group: there are place in western Alaska that are important for different reason, how do we decide which ones are more important. He added that those rivers would be a real challenge due to the need to establish water levels. Mr. Stone said that in order to carry out those surveys, we would have to gain more expertise at using equipment such as bottom-mounted pressure gauges and GPS tide buoys in those areas.

Integrated Ocean and Coastal Mapping (IOCM), Coastal Resilience, and National Mapping Strategy

Audra Luscher, Resilience Program Manager, CO-OPS

Ms. Luscher discussed foundational information and what it means to apply it to coastal intelligence versus coastal resilience. Resilience is a feedback loop. For politicians who prefer not to work around climate change, resilience has provided a great framework to continue talking about changing conditions without tying it to the concept of climate change. When events do happen, we need to be prepared to advocate for, not just putting the community back the way it was but to take a step forward toward making it more resilient. Since Hurricane Sandy, we have a new disaster recovery framework that incorporates things like ecosystems which were not previously part of recovery.

Resilience is dynamic. Communities can change their resiliency in a number of ways for better or worse. The question is: How do we set up consistent and fundamental ways to assess where we are in the resiliency spectrum to know how socially or ecologically vulnerable we are? Indicators are becoming a big part of the management component of resilience.

Communities rely on authoritative information. For coastal intelligence, we have to look at using the same data in different time horizons. Many managers can't make authoritative decisions based on information for a long-term time horizon. We have been looking at sea levels in a long-term perspective, but the sea level has fundamentally changed how high the tide is rising in communities every day, resulting in nuisance flooding.

Coastal resilience is about sitting on the shoulders of coastal intelligence. It is important to weave these stories together so that they don't appear competitive. Ports should be stepping up just as much as communities going for resilience grants and looking at future conditions. Resilience brings in an ability to leverage and create new opportunities under the navigation portfolio:

Opportunity 1: Adapt existing foundational technologies, instrumentation, and procedures to support resilience. By adapting current procedures, we could service resilience in a very strong way. Some of the PORTS systems have been around for 19 years, collecting data from pre- and post-event conditions that could be analyzed. The reference frame should be applied to monitor changes in coastal land elevations and water levels.

Opportunity 2: Increase the use of observations to validate hydrodynamic models. Use these baseline monitoring to inform decision support applications.

Opportunity 3: Extend support to PORTS beyond real-time navigation applications. Products that help industries understand changes and how to make contingency plans will ultimately make people, places, and ports more resilient.

Ashley Chappell, IOCM Coordinator, OCS

Ms. Chappell discussed the interagency commitment on the National Coastal Mapping Strategy. All of the pieces of resiliency have an underlying need for ocean and coastal mapping data. The IWG-OCM is co-chaired by NOAA, USGS, and USACE, and is charged with facilitating the coordination of ocean and coastal mapping activities and avoiding duplications. The Ocean and Coastal Mapping Integration Act of 2009 charged the IWG-OCM with developing an annually updated National Ocean and Coastal Mapping Plan. The group was further charged in the National Ocean Policy Initiative to develop an interagency plan for topographic and shallow bathymetric mapping to ensure comprehensive and accurate elevation information for coastlines. The implementation plan focused initially on coastal LIDAR which was

merged with the terrestrial LIDAR mapping effort, 3-D Elevation Program (3DEP). Together, these efforts leverage the 3D Nation Initiative that seeks to create a modern, accurate elevation foundation for the entire country. This is considered a high priority data need given the return on investments assessments. JALBTCX (Joint Airborne LIDAR Bathymetry Technical Center of Expertise) has made great advances coordinating on LIDAR acquisition. Ms. Chappell noted that for Version 2.0, we will be looking at other types of acquisition, in particular offshore acoustic aerial photography.

The NCMS has five components:

- An aspirational strategy :
    - How IWG-OCM agencies and partners *could* achieve comprehensive coastal LIDAR elevation mapping
    - Assumes commitment to 3D Nation in addition to primary missions/mandates
    - Sufficient resources
    - Coordinated acquisition strategy among federal/state/academia/private sector
- An Annual Coastal Mapping Summit
- Working towards common standards
- Common data management procedures – a "whole life cycle" approach
- Consensus on targeted research and development

The acquisition strategy builds on USACE's topographic and bathymetric eight-year cycle. The SeaSketch mapping tool is a temporary demonstration of the kind of technology desired which has been very useful. The NCMS will be put out for public comment soon, but there is still work to be done on quality levels and fine tuning the eight-year cycle. Version 2.0 will hope to emulate successes such as the California Seafloor Mapping Project.

Mike Aslaksen, Chief, Remote Sensing Division, NGS

Mr. Aslaksen provided an update on the operations within IOCM. Orthomosaic imagery is NGS' baseline technology and he briefly reviewed the technology and its derived applications, such as a LIDAR Point Cloud. Complementary sensing technologies are being used to drive how, where, and when we fly topobathy LIDAR. Sandy Supplemental Funding allowed IOCM to partner with the National Centers for Coastal Ocean Science to develop a water clarity product and look long-term towards building a climatology. Satellite-derived bathymetry has blossomed within NOAA as a tool for determining charting priorities. NOAA has been very enabled by access to data and the ability of GIS to process data. On top of all this is topobathy data and NOAA has built a case for private investment in the technology. The multiuse of the data is what makes it so appealing; this is the foundational data on which resilience happens. A key research item being looking at is how to pair laser observations with the water clarity products for refining data. Mr. Aslaksen demonstrated the level of detail provided by green LIDAR. Stakeholders want the seamless data provided by this immense data set and he believes the technology is going to be big.

There have been several challenges which led to delays in delivery of the Sandy data but everything is expected to be delivered by the middle of July. NGS is planning to use imagery quite a bit, especially in the ports. From the upgrades in the camera systems, we are planning to collect georeferenced oblique imagery to provide baseline data for hurricane response; Coastal Managers are big users of this kind of

imagery. Mr. Aslaksen reviewed NGS' topobathy operations. Shoreline data is delivered through the NOAA Shoreline Data Explorer and the LIDAR data is delivered through the Digital Coast partners at OCM.

Member Kudrna asked if there is any documentation of behavioral changes in municipalities based on this information. Mr. Aslaksen said that Digital Coast has opened up its architecture for higher-level planning and, in one example, the City of New York has used that tool. Ms. Luscher said that there is a resilience GPRA that tracks long-term adaptations resulting from policy changes. Some economic information has been included in the assessment s of how data is influencing decision making in regards to community resilience. Behavioral change is a new area that NOAA is just beginning to focus on. The two resilience initiatives that cycled in included how much the data costs and how much it is influencing changes to the infrastructure. Member Maune pointed to the National Enhanced Elevation Assessment study which focuses on return on investment.

Chair Perkins asked how the implementation of the new topobathy LIDAR dataset has changed cost efficiency of the program. Mr. Aslaksen said that it costs more but the multiuse of the data far outweighs the incremental costs. This technology offers more opportunities to collect data on a day-to-day basis, as opposed to waiting for tide windows, sun angles and other factors to line up. The dataset also produces not only a shoreline but also shallow water bathymetry. After a couple of years, NGS will look at the cost-savings analysis.

Chair Perkins asked if the oblique aerial imagery would allow for post-storm damage assessments in an automatic change detection environment. Mr. Aslaksen said it's a multiuse data set, but initially it is a pre-event planning data set. It may not be able to perform automatic change detection, but we could provide georeferenced imagery that decision makers could incorporate into GIS.

Member Miller asked about the funding status of IOCM and when acoustic data will be coming into the IOCM framework. Ms. Chappell responded that there is no direct IOCM funding stream but NOAA and other partners are committed to IOCM projects and if budgets improve there is a good foundation for continuing with these partnerships. IOCM will probably start looking at sonar this fall, after the first version is released.

Member Jeffress asked if the Bureau of Economic Geology out of the University of Texas Austin is involved in the coastal mapping effort. He also asked what standards have been established for ingesting all of this LIDAR data. Ms. Chappell said the National Coastal Mapping Summit is open to any entity, both for recommending priority areas and for partnering. She wants to bring in everyone engaged in mapping and set data quality standards. The proposed date for the Summit is June 17 at the Oregon State University. Chair Perkins noted that the University's sensor package is different from what was used in the Sandy Supplemental program and that there may be some differences in the fidelity or content of those data sets. Member Lockhart replied that both are new generation sensors, they are similar tools but have different specifications. Chair Perkins asked Member Lockhart to prepare a presentation for the Panel comparing the datasets.

Breakout Session De-briefs to HSRP

Coastal Intelligence

Member Miller reported that the group's discussion focused primarily on maximizing access to highly trafficked and increasingly space-constrained ports by providing ship managers with real-time information to maintain reliable safety margins and the criteria for selecting new ports for Precision Navigation systems. Criteria included quantifiable physical elements such as population, inundation risk, tidal signature swell, weather patterns, and the number of vessels that call on the port, particularly large vessels. Other considerations included partnerships available in particular areas, where is there potential funding, who needs it most, and which places are most at risk. Member Blackwell shared criteria used for determining priorities used for GRAV-D. The group discussed the common elements of Precision Navigation and PORTS and whether a new funding model needs to be created for Precision Navigation.

RDML Glang added Member Kelly's suggestion for utilizing the Coast Guard's risk methodology, the Port and Waterways Risk Assessment (PAWSA), which he believes would be a useful approach. Mr. Ferguson said that the Port of Long Beach will be doing a PAWSA this summer and they can share their experiences with the HSRP.

Coastal Resilience

Ms. Chappell reported that the theme throughout the coastal resilience conversation was that we can't do this alone, we really need to integrate across Agencies from our different perspectives and mandates, honing in on what NOAA has to offer those different perspectives. A number of discussions are centered on applications and visualizations, and partnerships are going to be a big part of this. The group wrestled with the issue of how much information to provide through these applications to avoid inundating stakeholders with too much information. Questions considered were: How do we grapple with this new resilience funding that is going to be flowing into communities? Where do we insert ourselves and how do we make ourselves relevant from a navigation and foundational information perspective to these communities? One suggestion was to consolidate a number of gauges together to make a decision support network on storm surge or sea level rise. Another was the whole perspective of sea level and the contribution of land subsidence. Working at that level is important so that communities understand the change. How can NOAA's information better support incentive programs, like FEMA's Community Rating System? IOOS, Navigation Managers, people working through the Sea Grant Extension, and advocates working at the local level can use this information to better integrate into a management framework.

Ms. Chappell added that Navigation Services programs should take some time to figure out who the users are and who is being targeted for the messaging.

Public Comment

There was no public comment.

Adjournment

The meeting was adjourned at 5:59 p.m.

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Friday, April 10, 2015

The meeting was called to order at 8:35 a.m.

Chair Perkins provided a recap of the previous day's sessions. The group reconvened the breakout sessions that were started on Thursday with the goal of developing work plans.

HSRP Discussion of Work Plans

Coastal Intelligence

Member Miller reported that the group recommended that the NOS Road Map should better reflect the core activities of Navigation Services. Their response to meeting the needs of expanded commerce and busy ports through enhanced and integrated decision support tools and maximizing access to high-traffic and increasingly space-strained ports included:

- The demonstration in LA/Long Beach
- Integration of NOAA data
- The development of an integrated product.

The group expects 1 to 2 years of development and system validation.

The group continued its discussion on determining criteria for selecting the next locations for Precision Navigation. PAWSA would be used as one data point in a larger evaluation process, to be combined with the US Army Corp Cost-Benefit Analysis tool and other factors not included in either. The list for criteria was refined to include:

- Who is willing/ready to partner?
- Who needs it most?
- Which ports are most at risk?
- Is port expansion planned?
- Where is it easiest to install?
- What does the existing infrastructure look like?

The group had a robust discussion on how to market the product and the need to develop new marketing models for Precision Navigation. A concern was raised that if a commercial entity opts to buy the sensors and the program, should the data be made public and does that entity have the right to sell the data?

Coastal Resilience

Mr. Aslaksen reported that, first and foremost, there is a need to define and prioritize the core products that the Nav Services provide which enable, or are critical to, resiliency. This also includes looking at long-term data streams (e.g. the decades of information from PORTS) and building a climatology of a certain area that could lead to improved decision making.

Other topics included access to data through visualizations for clarity among a larger audience and prioritizing gaps and data streams. The Hampton Roads Pilot Project is an opportunity to demonstrate

what can be done in a high-profile case supported by many agencies. The group recommended that this demonstration be a focus area for Nav Services to deliver and provide the capability to support resiliency.

The group discussed the importance of identifying stakeholders in ongoing efforts. Are we taking advantage of current activities inside and outside of NOAA in terms of education. How can we work with these folks directly and not duplicate ongoing efforts.

How do we connect what we do in priority data streams to the current funding efforts? Are there avenues for working with the overseers of resiliency grants to include guidelines and specifications that Nav Services provide and/or reference the capabilities to meet the outcome of those grants. Incentivizing communities to do things in certain ways may be an avenue for a recommendation to the panel in the Nav Services. The group stressed the importance of coastal resilience rating criteria.

Member Shingledecker added that both groups share some concern that the NOS Road Map doesn't cover everything that the HSRP may wish to comment on.

At the request of the Panel, Member Atkinson provided the group with some background and specifics on the Hampton Roads Pilot Project. He also offered to give a larger presentation to the Panel at a later time.

Ms. Luscher said that one of the issues facing this project is how to integrate the data from the local level gauges that were installed for very specific purposes and do not contribute to the larger reference frame like NWLON would. How to tie these subordinate stations to an NWLON so that they could derive datum for calculating mean sea level or integrate the information with decision-making tools tied to landmarks in socially relevant areas. Member Atkinson said that this may be one model for how to do these things in other areas. Ms. Luscher asked how we could take this and provide protocols that another community could apply. Member Kudrna said that the real accomplishment would be behavioral changes in planning commissions and municipalities. Member Jeffress mentioned the difficulty in getting elected officials in local governments to listen to potentially bad news.

Discussion on Working Groups

Chair Perkins led the discussion on which of the working groups will be retained and proposals for new working groups. The three working groups that were established in 2012 and the two that were proposed in Charleston were reviewed.

Legislative & Policy Initiatives – Member Miller, Chair: Review and revise HSRP charter (accomplished). Proposed: review HSIA for recommended revisions, monitor legislative initiatives pertinent to HSRP (perhaps develop SOPs). Because the charter comes up every two years, Member Miller recommended retaining the L&P WG. She suggested the Working Group address SOPs and push back work on the IOCM until spring of 2016. This group shall remain with Member Miller as Chair.

Strategic Mission-Centered Effectiveness Working Group - Member Jeffress felt this group did not have a well-defined mission and was, therefore, not very effective. This Working Group will be dissolved and a new group established with an appropriate title and clear purpose.

Emerging Arctic Priorities – Lawson Brigham, Chair. Chair Perkins said everyone is very happy with the work this group has done. This group will be retained with Member Lawson as Chair.

An ad hoc Working Group charged with planning the next meeting will be retained.

An Engagement Working Group was proposed to address the need for communication and outreach on the needs and accomplishments of the HSRP. The work of this group may eventually reside with the L&P WG, but Vice-Chair Hanson said that there is a lot of groundwork that needs to be done first. Member Shingledecker requested more clarification on what we want to communicate and how, as well as how it might be received. While it is a useful topic, until those questions are answered, a Working Group that spends its time answering Dr. Callender's questions or Breakout Group questions might be more beneficial. Member Kudrna responded that NOAA does great research and data collection but, as the Science Advisory Board has said, engagement is its weak link. The HSRP could be very useful in this capacity. Member Miller said that, to some extent, there are mixed messages coming from NOAA leadership on what they are looking for in engagement.

It was decided that the Engagement Working Group should be combined with the Planning Working Group and a draft purpose statement was created: Identify and develop appropriate outreach tools to effectively engage relevant stakeholders to convey the key messages identified by the HSRP. Members Maune and Kudrna will Co-Chair.

Member Miller proposed a temporary Working Group to address coastal intelligence and resilience in the context of Dr. Callender's questions. Chair Perkins was concerned that some of the questions would be huge tasks unto themselves, but Vice-Chair Hanson responded that they would not be if the Working Group is advising and directing from a high level. Member Kudrna asked if Callender's questions were seeking long-term multiple responses or if he is setting questions to the HSRP for this meeting that will be followed by new questions at the next. RDML Glang said that it is up to the Panel how they would respond but higher-level input is sought by the next meeting. Members Atkinson and Lockhart will Co-Chair.

During discussions, Member Miller announced that Representative Lowenthal had just joined the Coastal Community Caucus. RDML Glang suggested including that item in the Panel's report to the Administrator.

Items to be included in the meeting report include:

- A statement regarding HSRP's engagement with Rep. Lowenthal, his proposed legislation and his joining the Coastal Communities Caucus.
- A statement regarding the importance of what's been learned regarding the Precision Navigation Project in LA/Long Beach.
- Mention of effective partnerships
- A statement that the HSRP was pleased to note that progress was being made on NOS cooperative agreements and Pre-Scripted Mission Assignments with USACE and FEMA, although no new agreements are in effect at this time.
- A statement on the importance of outreach and engagement.
- Acknowledgement of the importance of the West Coast buoy network for recreational boating as a strictly local issue.

There was discussion on planning logistics for the next meeting in Washington, DC. RDML Glang said that it will be up to the panel who they would like to interface with, but getting on Admin. Sullivan's calendar is a good idea. Vice-Chair Hanson said a meeting at Commerce would be a good idea to meet with International Trade representatives on issues surrounding the supply chain.

Public Comment

There was no public comment.

HSRP Discussion of Process and Procedures Document

Chair Perkins led the discussion. During the Administrative Session, the Panel drafted a statement stating that at the end of each meeting segment or half-day, the Panel will summarize critical points brought up during that segment. White boards or on-screen documents will be used to record these summaries and the Panel members, with NOS support and personnel, will coordinate compilation and collection of those summaries.

The timeline for sending the Recommendation Letter to the Administrator is:

- Two weeks from conclusion of meeting for review of Draft Recommendation Letter by Panel
    - Followed by two weeks for comment on the Final Recommendation Letter
- 30 days from conclusion of meeting for receipt of the official transcript
- 30 days from conclusion of meeting for receipt of the meeting minutes and distribution/posting to Google Drive
    - Followed by two weeks for comments and edits
    - Final meeting minutes published two week later

RADM Glang said that, prior to the Charleston meeting, Coast Survey staff prepared the meeting summaries which were more succinct. Member Miller said that if we're going to develop a summary out of notes taken at the meeting, we will have to have designated note takers. If it's a Panel Member, then that person loses out on the discussion. The bylaws state that NOAA is required to provide clerical services during the meetings, but they need a faster turnaround. Member Shingledecker suggested that an agenda item be built into each day's schedule to discuss the key points of what has been discussed. Chair Perkins: It's clear there is a need for take-aways, and every member is capable of taking notes and sharing them in a wrap-up session, reviewed at the beginning of day in an administrative session, then at the end of the meeting they should be in a good position to formulate the recommendation letter.

Creation of the meeting report

Member Blackwell said there needs to be some clarification of what NOAA staff's support should be. The Panel would be taking on significant administrative burden to do all of the daily note-taking, there does need to be some capturing of information separate from the transcript. Member Miller said that, if a summary is going to be prepared, the Panel or someone with technical knowledge needs to at least review it. RDML Glang said that his concern was that the Recommendation Letter was created after the meeting and the content didn't necessarily reflect everyone's input. One way to mitigate this was to have available some notes or takeaways that don't have to be totally complete but everyone should agree that they are representative of what was discussed. Member Shingledecker said that preparing the letter from

the summary or transcript slows down the process. Perhaps the letter can come first, then after the summary is received NOAA staff can extract relevant items to prepare a meeting report to send to the Administrator. Member Barbor agreed and said that the Letter's formulation should be part of the deliberations. Member Miller said that NOAA staff should be charged with doing a real-time draft summary of the key points from the discussions as each session wraps, and provide note-takers for breakout sessions. RDML Glang said that NOAA staff could certainly provide informal meeting minutes going forward, but we shouldn't strive for a product that would be as comprehensive as what is received from the Court Reporter and every Panel Member has the opportunity to review the minutes and make any changes they think are necessary. Chair Perkins commented that breakouts and administrative sessions are not being captured by the Court Reporter and the flip charts that were prepared during those sessions are not audible. How do we get the content from these sessions into the meeting summary? RDML Glang responded that the outcomes of the breakouts are recorded in some way – there is a hard copy that becomes part of the record, the report outs and those discussions are part of the record.

Recommendation Letter

Chair Perkins asked, given Panel members' schedules, how long is a reasonable amount of time for responses. Member Miller suggested one week and said that if a member reviews the draft and does not have any comments, they should put their name at the end of the document and say "No comments" so it is clear that everyone had a chance to review it. Member Kudrna suggested making the draft review period two weeks, followed by two weeks for review of the final product. Chair Perkins asked if the NOS review of the Letter fit within this timeframe. RDML Glang replied that it's the Panel's Letter, NOS doesn't need to be involved at all. He felt the timeframe was reasonable if Paul Bradley's assistance were to be sought in preparing the letter.

Member Miller said some expectations should be set for receiving a response to the Recommendation Letter. After the Charleston meeting, Chair Perkins sent all of the presenters a letter thanking them for their time and provided them with a copy of the Recommendation Letter. He would like to do the same thing again, but with a letter endorsed by the whole Panel. Member Fields suggested following up with a note on where a presenter's issue stands and providing them with links to where on the NOAA website they can follow the status of their issue what NOAA's response is to the recommendation. RDML Glang said NOS' website is undergoing several updates and probably won't be finished for about 9 months. New documents can still be posted to the current website. Member Fields recommended posting the recommendations from Charleston and the current meeting and whatever the responses are to the website.

Tracking the activity of Working Groups and how they report back to the larger Panel

Member Miller said that expectations for number of meetings would depend on what the objective of the Working Group is and expectations shouldn't be codified. Chair Perkins suggested that maybe the Working Group Chair should report progress once a month. Member Shingledecker said that at each physical meeting of the HSRP, Working Groups should discuss the activities and expected outcomes by the following meeting. Member Kudrna said some elements require short-term decisions and feedback to take action on. Member Fields suggested making the SOP a living document that can be modified as appropriate.

HSRP Discussion on Meeting Report to NOAA Administrator

Chair Perkins led discussion on the draft Recommendation Letter. The letter will focus primarily on recommending full utilization of NOAA's hydrographic survey fleet. Member Kudrna said they should be recommending something be done to address the backlog. Member Barbor said the issue is NOAA being inefficient and compromising its long-term core competency. Member Miller said the real concern is the basic hydrographic expertise being lost; NOAA has to retain its core capabilities. RDML Glang discussed the variety of reasons for the backlog and 58.6 percent utilization of allocated sea days. Member Miller said it is important to demonstrate that ship usage has steadily declined over the years and a graph should be included to illustrate this. Member Blackwell suggested requesting a briefing on the issue at the next HSRP meeting in Washington, DC. CAPT Brennan said this is has become a systemic problem because of the legislative and budgetary hurdles. He proposed asking how this board could potentially help with that situation. Member Miller said the HSRP does not need to be sensitive to internal NOAA politics, we need to look at what NOAA's doing and if they're doing it right.

Member Barbor added a second recommendation regarding Precision Navigation and the successful partnerships in LA/LB. CAPT Brennan discussed some of the enhancements that they were hoping to add to the web server – wave model overlays as well as winds and AIS added to the web viewer. In this instance, the intent was to demonstrate the capabilities for LA/LB. Member Kelly felt it would be important to maintain that Precision Navigation is distinct from PORTS and they should seek to rebrand it position themselves for selling it as a new product.

Chair Perkins said the Panel had the best point of conclusion he's seen had regarding the Recommendation Letter.

HSRP Future Meeting Planning Discussion

Chair Perkins asked for the Panel's input on what they would like him to convey to the IOOS FACA at the April 30 meeting. Member Barbor said Regional Associations do outreach very well and he would like to hear their advice on outreach mechanisms to get support for NOS products and data. He suggested soliciting their comments on NOS' data and information models. Member Shingledecker relayed an email from Paul Bradley stating that IOOS' external players, not the NOAA program, has been providing outreach on how IOOS supports the maritime industry, it would be helpful for HSRP members to listen in on this. Member Kudrna suggested inviting IOOS and Sea Grant's Washington-based leadership to address the HSRP on outreach aspects. Member Shingledecker said half of the time should be spent discussing what HSRP does, and half what HSRP could learn from IOOS. Member Kudrna provided some background on IOOS' structure and some of the internal issues they're dealing with currently. Chair Perkins will post a previous presentation on HSRP to the Google Drive and he solicited feedback from the Panel members. Member Anderson suggested pointing out that the sensors and observations they make have potential value in the Precision Navigation environment; CO-OPS has been working in this direction. Mr. Stone noted the issue of how operational those tools are; clarification and discussion on that issue would be very beneficial.

HSRP Discussion on Future Meeting

Chair Perkins led discussion on first meeting of 2016 regarding location and what the Panel hopes to obtain from that location and regional stakeholder inputs. Vice Chair Hanson proposed Houston as a place to discuss Precision Navigation because of their experiences with oil spills, collisions, and coastal

issues. Member Jeffress noted that Houston is the fifth largest port system in the nation and does not have PORTS. Miami, Seattle, and the Great Lakes area were also discussed as options. Panel Members also expressed interest in going to UNH; Member Armstrong said they would be happy to host a meeting. NOS will provide a list of previous meeting dates and locations to the HSRP and conduct and informal poll by email.

Adjournment

The meeting was adjourned at 3:54 p.m.

HSRP VOTING MEMBERS IN ATTENDANCE:

Larry Atkinson, Ph.D.	Professor of Oceanography, Old Dominion University, Virginia
RADM Kenneth Barbor	Director, Hydrographic Science Research Center, University of Southern Mississippi
Lawson W. Brigham, Ph.D.	Professor of Geology and Arctic Policy, University of Alaska Fairbanks
RADM Evelyn Fields	NOAA Corps (retired)
William Hanson, Vice Chair	Vice President of US Business Development, 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
Edward J. Kelly	Executive Director, Maritime Association of the Port of NY/NJ
Frank Kudrna, Ph.D.	Chief Engineer, Port of Chicago; AECOM URS Corporation
Carol Lockhart	Hydrographic Surveying/LiDAR Hydrography
David Maune, PhD	Senior Remote Sensing Project Manager, Dewberry Consultants
Joyce E. Miller	Director of Seafloor Data Services, Hawaii Mapping Research Group Research Corporation, University of Hawaii
Scott R. Perkins, HSRP Chair	Director Federal Programs, Surveying and Mapping, LLC
Captain Salvatore Rassello	Director, Nautical Operations, Carnival Cruise Lines
Susan Shingledecker	Assistant Vice President and Director of Environmental

	Programs, BoatU.S. Foundation for Boating Safety and Clean Water

HSRP NON-VOTING MEMBERS IN ATTENDANCE:

Andy Armstrong	Co-Director, Center for Coastal and Ocean Mapping, Joint Hydrographic Center, University of New Hampshire
Juliana Blackwell	Director, National Geodetic Survey, NOAA

HSRP NON-VOTING MEMBERS NOT IN ATTENDANCE:

Richard Edwing (Peter Stone served as alternate)	Director, Center for Operational Oceanography Products & Services, NOAA

DESIGNATED FEDERAL OFFICIAL:

RDML Gerd F. Glang	Director, Office of Coast Survey, NOAA

NOAA STAFF PRESENT:

Mike Aslaksen	Chief, Remote Sensing Division, NGS
Glenn Boledovich	Director, NOS/PCAD
Captain Rick Brennan	Chief, Coast Survey Development Laboratory
Dana Caccamise	NOS/NGS
Russell Callender, Ph.D.	Acting Assistant Administrator, NOS
Ashley Chappell	IOCM, NOS/OCS
Jeff Ferguson	OCS Navigation Services Division, California Navigation Manager
Tiffany House	NOS/NGS
David Kennedy (via phone)	NOAA Arctic Policy Advisor, Office of the Undersecretary
Audra Luscher	CO-OPS
Lynne Mersfelder-Lewis	HSRP Program Coordinator

Captain Russ Proctor	Chief, Nautical Survey Division, NOS/OCS
Peter Stone (alternate for Richard Edwing)	CO-OPS
Bianca Terry	NOS

SPEAKERS AND ATTENDEES:

Christopher Cannon	Director, Environmental Management, Port of Los Angeles
Mike Christensen	Senior Executive Lead for Supply Chain Optimization, Port of Long Beach
Tom Cullen	Administrator, State of California Office of Spill Prevention
Jeff Ferguson	OCS Navigation Services Division, California Navigation Manager
Jim Haussener	Executive Director, California Marine Affairs and Navigation Conference
Congressman Alan Lowenthal	
John Z. Strong	Jacobsen Pilots Service, Long Beach, CA
Julie Thomas	Southern California Coastal Ocean Observing System (SCCOOS), Scripps University
Captain Jennifer Williams	USCG Long Beach