SUMMARY RECORD
Hydrographic Services Review Panel
Public Meeting
October 12-13, 2010
Vancouver, Washington

Tuesday, October 12, 2010

Introduction

On the call of the Designated Federal Officer (DFO), Captain John Lowell, National Oceanic and Atmospheric Administration (NOAA), the Hydrographic Services Review Panel (HSRP) meeting was convened on October 12, 2010 at the Heathman Lodge, 7801 NE Greenwood Drive, Vancouver, Washington.

The following report summarizes the deliberations of this meeting. Presentations and documents are available for public inspection via the web 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, MD 20910. The Agenda is available via the web at http://www.nauticalcharts.noaa.gov/ocs/hsrp/archive/2010/May/Agenda_Final.pdf

Call to Order

Mr. Ed Welch, Chair, HSRP, called the meeting to order on Tuesday, October 12, 2010, at 8:30 a.m. He then turned the meeting over to Captain Lowell for opening comments.

Opening Comments

Captain John Lowell, NOAA, Designated Federal Officer, began the meeting by providing emergency procedure logistics and a brief description of the HSRP Panel, its mission goals and meeting protocols. Captain Lowell also introduced himself as the HSRP Designated Federal Official (DFO) and stated that the HSRP is a Federal Advisory Committee (FAC) that provides recommendations and information on NOAA's hydrographic services. He recognized the HSRP Panel members present. He stated that Juliana Blackwell, Director of the National Geodetic Survey (NGS) is not present but represented by Ronnie Taylor, Acting Director NGS. Also present is Rich Edwing, Director Center for Operational Oceanographic Products and Services (CO-OPS), and himself as Director of Office of Coast Survey (OCS). Captain Lowell then turned the meeting over to Ed Welch, HSRP Chair.

Mr. Welch asked the HSRP to introduce themselves for the NOAA participants, as well as Speakers and other meeting attendees. Mr. Welch stated that Public sign in sheets were on the back tables and for any Public attendees to please sign in, and indicate if

they wished to make a public comment. Mr. Welch presented that the meeting program will focus on the challenges and special conditions of the Columbia River system and the Pacific Northwest. He also welcomed Dr. Larry Robinson, Assistant Secretary of Commerce and stated that the Panel is interested in hearing Dr. Robinson's message. Attendee list can be found at end of the Summary Record.

Welcoming Remarks

Dr. Larry Robinson, Assistant Secretary of Commerce for Oceans and Atmosphere, discussed that he toured the NOAA Ship *RAINIER* while undergoing repairs at the Port of Portland and recognized how the technology of hydrographic surveying has changed over the several years. Dr. Robinson discussed that maritime commerce is a critical piece of the American economy and generates many economic benefits via America's ports and waterways, and that the importance of the marine transportation system cannot be overstated and is integral to the Obama national ocean policy. Dr. Robinson presented that the National Ocean Policy Taskforce created the National Ocean Policy to ensure the stewardship of our oceans, coasts and Great Lakes, and that this national policy creates a National Ocean Council (NOC) comprised of 27 fellow agencies and is charged with the coordination and recommendations, and measuring outcomes for implementing the National Ocean Policy. Dr. Robinson noted to the Panel that NOAA and Commerce each share seats on the NOC, that he represents NOAA on the Deputies Committee of the NOC, and that NOAA worked tirelessly in helping shape the development of this National Ocean Policy (NOP) process. He also stated that the NOP creates nine national objectives that coordinate and integrate across the agencies.

Dr. Robinson also talked about Coastal and Marine Spatial Planning (CMSP), the public policy process that will help better determine how to sustainably use and protect our oceans, coasts and Great Lakes, and that the CMSP framework includes nine regional planning bodies to ensure that the unique needs of each region of the United States are met in ways that respect the regional objectives and priorities. Dr. Robinson noted that the product services and information provided by NOAA's navigation and services offices (i.e., Coast Survey, Geodetic Survey and Center for Operational Oceanographic Products and Services) are integral to a number of the objectives in the NOP.
Dr. Robinson presented that CMSP is designed to reduce conflict among users and increase efficiency and predictability of government actions in relation to marine transportation interests. For, example, CMSP may expedite issues like the permitting process of port development, dredging, and expansion projects, and create a balanced and predictable environment for ports, rivers and other maritime posts to make sound business decisions on trade and water commerce. He emphasized that CMSP provides a framework to balance uses against demands for emerging technologies such as renewable energy, and that NOAA's navigational services and offices play a valuable role in CMSP. Dr. Robinson further pointed out that the NOP and CMSP can serve to bring attention to the importance of NOAA's navigation products, nautical charts, water level and current data, positioning information, shoreline identification, and marine zonal boundaries. He also stated that NOAA's ability to provide navigational services and ocean observation information will provide the maritime community with improved

forecasts for weather and ocean conditions, as well as, enhanced mapping to support safe, efficient marine navigation and commerce. Dr. Robinson stated that stewardship is another priority objective that ties closely with the mission of NOAA's navigational services offices. He presented that an improved geodetic, water level, surveying and mapping infrastructure is needed to support the developing Arctic marine transportation system. Dr. Robinson further stated that NOAA is positioning itself to provide the information, products and services needed to meet the emerging needs of the Arctic region, and that NOAA's navigation offices play an integral role in implementing the National Ocean Policy. He charged the stakeholders and Panel to get involved in regional planning to ensure the marine transportation and hydrographic interests are well represented within the national dialogue.

Mr. Welch thanked Dr. Robinson and noted that the HSRP developed an original report of most wanted list of hydrographic services improvements back in 2007, but that the Panel recently updated this report to reflect more relevant recommendations for NOAA Leadership.

Keynote Address

Colonel Steven R. Miles, U.S. Army Corps of Engineers (USACE) "Corps", presented the keynote address on the Columbia River and Maritime Commerce. Colonel Miles thanked the Panel and NOAA staff for the invitation to speak, and stated that he sees the Corps as contributor to the importance of hydrographic surveying, mapping and charting of the Columbia River. He stated that NOAA's hydrographic surveying and mapping and charting products are essential tools and crucial to understanding river flows and capacities, hydraulic conditions and sediment transport for use in dredging. Colonel Miles stated that the Corps Portland District operates and maintains nearly 400 miles of the Columbia and Snake River navigational lock system, this is an $18 billion transportation system—agricultural products travel from Lewiston, Idaho to the Pacific Ocean across the Columbia River system and are exported to places like Japan, Korea, China and Indonesia. He further stated how the Corps relies on NOAA's daily weather forecasts and severe storm warnings to effectively manage the reservoir release flows for prevention of flash floods. Colonel Miles presented that improving and maintaining navigation for economic development and safety is where the Corps and NOAA find common ground, and that the Corps values its relationship with NOAA for public safety and supporting maritime commerce. He presented that standardization and sharing of data is important, with differing formats of hydrographic survey and geospatial data, each agency should work together and synergize joint activities to leverage crucial resources. Colonel Miles proposed to the HSRP that the Corps and HSRP meet again next year with a joint meeting, have breakout sessions to discuss and tackler the challenges both agencies' face. He closed with stating that the state of Washington's maritime cargo is expected to increase from a current level of 75 million tons to 125 tons in the next 20 years; the Columbia River's impact is felt all the way across the United States; and that NOAA and the Corps work to safeguard the nation's environmental assets.

Mr. Welch thanked Colonel Miles and asked if Panel members had questions.

- Captain McGovern thanked Colonel Miles and stated that he was in 100% agreement that there needs to be a common data standard and that getting everyone together would be very good.
- Captain Lowell asked if Colonel Miles would address the challenges relating to moving funding around to address changing needs.
- Colonel Miles responded that the Corps' has flexibility to reprogram funding specifically for navigation emergencies, but that they also conduct feasibility studies as part of the normal operations process.
- Mr. Jeffress questioned Colonel Miles on how did the drought affect navigation in the Columbia River?
- Colonel Miles responded that this year was not as extreme as other years, and that he did not know of any restrictions due to low water areas for navigation—but that drought affects the Corps' ability to produce sufficient hydropower.
- Mr. Dasler noted that the Corps' stated difference between the shipping channel and the federal authorized channel was well taken; that the Panel understands the Corps' hydrographic services and chart mapping mission is only for federally-authorized depths and widths, and that NOAA's activities are more to get a full view of the entire bottom and conditions of the waterways as a whole; and that these agencies' hydrographic and mapping mission are not quite oriented towards the same purpose; thus, does the Corps' have any comments as to how the Corps' and NOAA better synchronize given the fact that they are both approaching it with a slightly different mission?
- Colonel Miles responded that he thinks the solution exists with the Corps' and NOAA technical folks getting together and figuring out how the data collection needs can be improved and shared.

Mr. Welch again thanked Colonel Miles for his excellent presentation and for the service the Corps' is providing, and introduced Mr. Kennedy as the next speaker,

National Ocean Service (NOS) Updates

David M. Kennedy, Acting Assistant Administrator, NOS, presented an update on NOAA's navigation services role and responsibility in the Deepwater Horizon oil spill. He presented that NOAA was fully involved from the beginning working with other Federal, state and local agencies during the damage assessment, response and operations, communications and restoration, and will continue to be involved for quite some time. He stated that some of NOAA's efforts ranged from conducting sampling to determine the level of contaminated fishery products; aerial imagery to determine oil spill impact on coastlines and habitats; satellite and trajectory modeling was updated on navigation charts to project movement of oil so shipping could avoid the impact areas; waterways of navigation ports needed to be cleaned quickly to ensure continued shipping and commerce movement; weather forecasts for predictions of hurricane impacts on direction and movement of oil; and mapping capability for finding anomalies under water that turned out to be plumes of oil. He stated that bathymetry charts were valuable for determining new anchorage locations for the ships that had oil on their

bottom and needed to be cleaned—they needed to anchor these ships somewhere until the cleaning was completed. He also discussed that information on tides, movement and onshore winds played an important role in determining coastal impacts, as well as shipping impacts. Mr. Kennedy closed his presentation elaborating that NOAA's navigation products, services and information capabilities played a vital and important role in NOAA's ability to effectively respond and assist with such a major event.

Mr. Welch thanked Mr. Kennedy and asked if the Panel had questions.

- Mr. McBride presented two questions: 1) considering media reports on the volume of the oil spill and NOAA's modeling capabilities—where did all the oil go? (2) how in the future does NOAA go about institutionalizing the lessons learned on this event, including future training and disseminating this through agencies and jurisdictions—if this happens again, we will have good information on what occurred in this case?
- Mr. Kennedy responded that NOAA is continually working with other agencies' on data collection, assessments, and studies—and that this would be a long-term process. There will be a response report led by the United States Coast Guard that NOAA will contribute to. NOAA itself is doing its own postmortem—looking at everything from operations to lessons learned at the national level.

Mr. Welch observed that one of the things the Panel has talked about in the past has been the need for NOAA and its Federal counterparts, and some other agencies to seek out folks in the private sector and at other levels of government on collaborative efforts in nautical services and ocean. With this, he introduced the West Coast Governors' Agreement (WGCA) on Ocean Health Stakeholder Panel. The WCGA is a major undertaking by several states to enhance ocean processes and ocean health and build up state resources and state responses and to coordinate this effort with the Federal government.

West Coast Governors' Agreement (WCGA) on Ocean Health

WGCA Overview, Jessica Hamilton-Keys, Natural Resources Policy Advisor, Oregon Governor Ted Kulongoski's Office, presented an overview of the WCGA effort. Jessica began her presentation with the call for regional ocean management which came from the Ocean Blueprint for the 21st Century Final Report of the U.S. Commission on Ocean Policy, 2004. He talked about how this report identified the need for regional, ecosystem-based management to ocean management, and that in response to this report, in 2006 the states of California, Oregon and Washington launched the West Coast Governor's Agreement on Ocean Health—a shared state effort between California, Oregon and Washington for a regional ocean management approach. She stated that the three states have common concerns about water pollution, ocean education, declining fish population, degraded marine habitats, and climate change impacts; therefore, they instituted collaborations on ocean issues to create mechanisms for expanding scientific and educational efforts, strategies to share ocean resources and engage the Federal government on the issues that the states

believe warrant national attention. Jessica discussed that the goal of the WCGA is to create a regional research priority plan to strategically focus investments in improved scientific understanding of ocean resources and process. She discussed that in 2008, the WCGA released an Action Plan that encompassed 26 actions ranging from evaluating the potential impacts of offshore alternative energy development to complete a seafloor map for West Coast territorial seas to supporting local planning effor6ts for working waterfronts. She further stated that to implement these actions, Action Coordination Teams were established to focus on such efforts as seafloor mapping, marine debris, renewable energy, climate change, integrated ecosystem assessments, etc. She discussed the common principles and common priorities of the National Ocean Policy Framework and how the WGCA supports coastal and marine spatial planning (CMSP). Further, she presented some of the challenges for regional CMSP such as funding, timelines, scale, lack of capacity and political changes in leadership. Jessica ended her presented with some benefits of CMSP on the regional level to include: leveraging resources, common information sharing, and increased collaboration with tribes, scientists, stakeholder, and other interested communities.

WCGA Seafloor Mapping Action Coordination Team—Federal Partnerships, Dr. Sam Johnson, U.S. Geological Survey (USGS), discussed the role of Federal agencies in seafloor mapping efforts for the West coast. He began with describing the California Seafloor Mapping Program (CSMP) which began in December 2005, a statewide marine mapping planning workshop to identify the kinds of products and data needed by stakeholders—workshops were held in California, Oregon and Washington. He presented that these workshops led to the California Ocean Protection Council in 2007 that approved $15 million for seafloor mapping; and in 2008, the NOAA Office of Coast Survey (OCS), through the American Recovery Reinvestment Act (ARRA) contributed funding support to sustain the program. He presented that the CSMP will: improve climate change and ocean circulation models; help evaluate the potential or ocean energy; identify submerged faults and improve understanding of tsunami potential; regulation of offshore development; improve maritime safety; and improve understanding of sediment transport and sand delivery. Dr. Johnson discussed the efforts and status under Action 6.3 of the WGCA Action Plan: Complete a seafloor map of the bathymetry, benthic substrate, relief, geology, and habitat of all state tidelands and submerged lands out to 3 miles. He presented key reasons for doing seafloor mapping to include: (1) safer navigation and commerce—110 new dangers to navigation have been discovered; (2) designation of marine protected areas; (3) defining and documenting habitat—ecosystem based management; (4) baselines for monitoring change; (5) bathymetry and Light Detection and Ranging (LIDAR) data needed to assist large-scale ecosystem restoration and assess sea level rise; (6) characterize earthquake faults and hazards; (7) characterize tsunami sources and impacts; (8) modeling tsunami inundation; (9) flooding, storm inundation—need for waves, currents, weather; (10) regional sediment management, distribution and sink; (11) siting infrastructure for offshore development and redevelopment—renewable energy, oil facilities, cables, etc., (12) marine spatial planning—seamless onshore-offshore geologic mapping; and (13) public education and awareness of what seafloor mapping is. Dr. Johnson also discussed some of the benefits of a regional seafloor

mapping program is that it supports the national framework for marine spatial planning, enhances intergovernmental collaboration, reduce conflicts among partnerships, and provides a transparent public stakeholder process. He said some challenges include: funding, staffing, continuity, and lack of capacity. Dr. Johnson ended his presentation stating that seafloor mapping is an important foundational science—the data is being used in various applications; there are major successes in leveraging resources through federal and state partnerships; curriculum is being designed for seafloor mapping efforts; and awareness efforts is educating the public on the importance of seafloor mapping and its benefits.

Mr. Welch thanked Dr. Johnson and asked if the Panel had questions.

- Mr. Dasler asked if Dr. Johnson could stress on the primary datum they are using for their mapping and the importance of the validation of those data.
- Dr. Johnson replied that the CSMP is using VDatum.
- Mr. Wellslager questioned where did they get their shoreline information from and how current is the data? And, how are they developing their ground truthing mechanism and what are they ground truthing?
- Dr. Johnson replied that the coastal LIDAR data is being collected by the USACE and is being incorporated into these maps and the USGS has generated the single-beam bathymetric data. Also, they start with the high-resolution bathymetric backscatter, take the camera sled over the representative sea bottoms in the mapping blocks, zero in on transitions within those blocks and result in the data needed to extrapolate across the rest of the area.
- Mr. Skinner noted to Dr. Johnson, Dr. Mark Borelli's mapping project inside Cape Cod bay area and how it produced interesting results in terms of a very dynamic shoreline process.
- Dr. Robinson questioned Dr. Johnson as to how did they deal with the quality assurance and quality control applied by different groups acquiring or accumulating that data?
- Dr. Johnson responded that the mapping data will be archived in the NOAA National Geophysical Data Center (NGDC) database and the contractor collecting the data states it meets the International Hydrographic Office (IHO) standards for nautical charting.
- Mr. Dasler asked if they get line items in the federal budgets or is most of the funding coming from the WCGA and other funding sources?
- Dr. Johnson responded stated that most of the money is coming from the coastal and marine geology program, some earmark monies in Fiscal Year (FY) 09, some from the California Ocean Protection Council and ocean conservancy.

WCGA Seafloor Mapping Action Coordination Team—State Partnerships, Dr. Chris Goldfinger, Oregon State University, presented the State's role in seafloor mapping for the West coast. Dr. Goldfinger pointed out that it's a high priority for the WCGA to identify the federal and state resources to map 100% of the shelf waters within the next decade to address some critical issues such as: (1) tsunami inundation modeling—accurate tsunami modeling depends on detailed coastal seafloor maps that

currently do not exist; (2) alternative energy sites and tidal dynamics can generate renewable power through emerging energy technologies such as wave farms, tidal generators, power generating buoys—seafloor mapping is necessary for identifying, evaluating and siting potential wave power installation locations; (3) marine and habitat science—seafloor mapping allows for modeling nearshore fish populations for both the Federal Essential Fish Habitat process and State fisheries management, as well as marine debris; (4) coastal erosion and rising sea level—parts of the coast are moving up and down very rapidly due to the cascade reduction process—threatening property, infrastructure, recreation, and coastal economies; these challenges require high-resolution near-shore bathymetry and coastal topography—seafloor mapping data provides the basis for modeling ocean circulation, currents, waves, and sediment transport; and (5) navigation and safe commerce—many areas along the West coast have not been mapped since the 19th and 20th centuries, the data is of poor quality and the nearshore seabed is constantly changing, requiring the need for updated data; high resolution seafloor mapping is needed to detect unknown navigation hazards, as well as providing base map data for engineering, scientific and commercial activities. Dr. Goldfinger further discussed how seafloor mapping began with the Oregon Seafloor Mapping Task Force in 2006 and the Oregon Seafloor Mapping Workshop at Oregon State University (OSU) in 2008. He also talked about funding sources, project structure, training programs, progress of survey areas mapped, other state joint mapping efforts, and continued ground truth mapping for the of Spring 2011.

WCGA Climate Action Coordination Team (ACT)—Climate Change and Sea Level Rise Impacts, Eli Levitt, Washington Department of Ecology, Climate Policy Group, discussed the impacts of climate change and state-federal partnerships. Mr. Levitt stated that the primary objective of the Climate Change ACT is to create a framework and access to information that helps local governments plan for shoreline impacts, assist state agencies, tribal governments and private sector in coastal land development and infrastructure planning, and develop recommended actions to mitigate and adapt to impacts of climate change. He outlined some strategies for developing improved understanding of the physical impacts on coast environments such as: identifying the physical forcing mechanisms—sea level rise, identify increased storm activity and increased wave height; develop a west coast-wide physical impacts assessment of shoreline change and assessment methods; identify a common classification system; identify habitat types and for protection and restoration; and identify hotspots of threatened habitats. He further talked about State and federal interests—progress and coordination in addressing the strategies, funding and staffing challenges, and use of data for decision making. Mr. Levitt closed his presentation stating that Climate Change ACT is anticipating coordinating and working closely with the seafloor mapping community as bathymetric and topographic data will be needed to create very accurate shoreline maps as more communities conduct vulnerability assessments to help mitigate and adapt to climate change impacts.

Mr. Welch thanked Mr. Levitt and asked if the Panel had questions for the WCGA presenters.

- Mr. Dasler posed to Mr. Levitt that from lessons learned during Katrina regarding problems with getting benchmarks and datums all on the same page—how is this being addressed? How is sea level rise being tied with the national spatial reference system?
- Mr. Levitt replied that climate modeling is done at the global level and downscaled to a local or regional level, and that modeling is a set of projections. For mapping, people are measuring it differently, using different marks and it varies from locality to locality—up and down the coast and there is different risk or potential flooding maps and our group is trying to address this issue. For the future, there is going to be a need for consistent methodology.
- Mr. Wellslager pointed out that Oregon's geodetic advisor could help them with creating a baseline of the heights, specifically along the coastline, and help identify where there are regions of subsidence or uplift. He further stated that if Oregon has active CORS (Continuously Operating Reference Station) network or a real-time network, this might be tied to the national spatial reference system and could provide reference data.
- Mr. Skinner asked if there were characteristics that Mr. Levitt could identify for other regions that are important to make this type of effort successful and any other potential stumbling blocks?
- Mrs. Jessica Hamilton-Keys responded to Mr. Skinner that seafloor mapping is one of those issues that was driven by the scientific community, fishing community, ocean policy advisory council, and conservation group—it was one of those win-win issues that everyone recognizes the benefits from getting the information.
- Dr. Robinson asked if there were any tendencies in local governments to change their zoning and permitting processes?
- Mr. Levitt replied that these sorts of changes are slow, but will take collaboration along the state and local lines to develop processes where, both stakeholders and the governments are developing recommendations together.

Mr. Welch thanked Mr. Levitt and the entire WCGA Panel for their relevant, important and timely presentations. He then introduced the Columbia River Stakeholder Panel and stated that having these types of Stakeholder Panels give the HSRP a much better appreciation of the strengths and areas of improvement for some of the NOAA services on which the HSRP gives advice on.

Columbia River Stakeholder Panel

Columbia River Maritime Commerce, Captain Paul Amos, President, Columbia River Pilots (CRP), presented that the Columbia River Pilots is a group of about 42 professional mariners, licensed by the State of Oregon and federal government to provide commercial pilot services and directional movements of the ships up and down the Columbia River, and that their main focus is to protect the public and environment and economy by ensuring ships move safely up and down the Columbia River system. Captain Amos' presentation focused on how the CRP uses NOAA's navigation data.

He stated that the Port of Portland is primarily a bulk port, largest exporter of wheat in the U.S., and the third largest gateway for grain exports in the world. He said they have deep draft ships with keel clearances of sometimes only two feet, and the river shifts and sand ways build up—thus, a critical need for up to the minute surveys, real-time information. He also said that they use Corps survey data and overlay NOAA chart data on their TV32 (vessel traffic information system custom software), and using NOAA's charting products makes it possible for CRP to maximize the available channel depths to better serve local commerce and the regional economy. Captain Amos elaborated that important NOAA products include: charts, tide and current predictions, national weather service forecasts, Loadmax (predicted river water levels), extreme low water prediction, PORTS® air gap data, mobile tides and current data (accessed via cell phones giving falling or rising tides & meteorological information)—all excellent tools used for safe navigation, but CRP also needs new ways to display data—more graphical formats. He explained that if pilots are busy digging through charts and tide tables and trying to figure the correctness in their area, it takes a lot of time and distracts the pilots from what they should be doing, looking out the window. He said there are frequent outages of the sensors, happening during low water levels—they get discrepancies in the river level data, sometimes off by one, two or three feet, and when we working two feet from the bottom that information is critical. Captain Amos said the CRP would like to see more air temperature and visibility on the PORTS®. Also, he stated they have problems with two different types of datum, different readings for mean lower low water levels for bridge clearances—what is the value of the data, is it Columbia River Datum (CRD) or MLLW? He also stated another frustration is the inability to get current multi-beam survey data for the Columbia River system. Captain Amos closed his presentation talking about the frustration of the U.S. Coast Guard's canceling funding of their research and development center for the use of placing AIS (Automatic Identification System) signals with the NOAA PORTS® program—to display environmental messages directly to shipboard laptops.

Navigating the Columbia River Bar, Captain Dan Jordan, Columbia River Bar Pilots (CRBP), presented about how the bar pilots bring ships safely into and out of the Columbia River Bar (CRB)—gateway for the Columbia river system out to the Pacific ocean. Captain Jordan talked about the dynamics of the typical weather conditions at the CRB, always southwesterly swells, meeting opposing river tide coming out so the swell then becomes steeper, taller, and then the coastal current—the flow of the river affects the seas and currents up to 11 miles outside of the Columbia river. He stated that the CRB pilots have direct, continuous communications with the NOAA's National Weather Service Forecast Office Pacific NW Coastal Marine Center. Captain Jordan stated that the CRP pilots use the forecast data, monitor the trend of buoy data to determine swell increase levels, and use this data to decide whether ships can safely pass over the CRB or resume ship traffic. Captain Jordan further presented the results of a Pacific Northwest Buoy Meeting where interested stakeholders explored ways to improve the current buoy system and provide better wave, wind and weather information for the Pacific Northwest—this meeting was convened primarily due to the poor reliability of the National Data Buoy Center (NDBC) buoys. He also stated the outcome of this meeting was a Corps' funded CDIP (Coastal Data Information Program)

wave buoy placed on the CRB, and displayed on NDBC's wave buoy data site. He said having this type of information enables the bar pilots to have additional current wave height data—comparing CDIP wave data with the NDBC buoy data, and that the more tools we have regarding wave heights, the better the decision making of whether or not to safely cross the bar. Further, he stated that they got a grant from the State of Oregon to add a second buoy creating a two-buoy system model, "The Coastal Wave Network Template" for assimilation and validation of wave model boundaries measured with a pair of inner and outer shelf buoys. Captain Jordan further discussed the concern that ships are getting bigger, but the Columbia River channel is not getting any wider—ships are sometimes confused with the dotted line contours on charts. He indicated that the Lower Columbia Region Harbor Safety Committee is looking at this issue and grappling with how to address the safety of navigation with the way channels are charted. Captain Jordan closed his presentation with recognition of the National Weather Service outstanding forecasting tools and their support; NDBC buoy reliability is imperative for wave bar forecasts; and NOAA and USCG are encouraged to explore solutions to the increasing trend of dotted line navigation, and recommended that NOAA modify their charted graphics of the improved channel and contours for the Columbia river system.

Chart Modernization for Portland District Projects, Mel Littell and Jacob Watts, U.S. Army Corps of Engineers, presented the different approaches of hydro survey chart modernization. Mr. Littell briefly talked about the history of chart modernization and how the older processes used resulted in different units and data. He presented how their new GIS (Geographic Information Systems) a Geodatabase GIS Data Storage Type approach works by improving chart performance to allow for directing all data to one central repository. Mr. Littell stated that the data updates can easily replace existing old data displayed on charts; creation of a GIS data set allows for analysis of existing NWP data; includes federal navigation channel framework; river miles; horizontal control points; dredged material placement areas; and it's a multi-agency data usage. He also talked about their new system allows for standardization of data and symbols, periodic updating of feature on charts, and removes duplication of efforts to collect data.

Mr. Watts described the geo database as a storage container for GIS data allowing holding of data from varying geographic locations or geographic projections within one database. He said basically, their new GIS system houses all the data the one finds on the new charts, and that the GIS allow the Corps' to incorporate data sets from other agencies, specifically, information from NOAA's Electronic Navigation Charts (ENC's) into their GIS system. Mr. Watts stated this GIS system results in more consistency from data points, additional data layers for more updated data, coloring of specific symbols such as shoaling areas for easy recognition, consistent naming structure, ENC data with buoy and obstruction points, and the inset maps contain real actual data, a streamlined package.

Columbia River Mapping Efforts, Michael Christy, David Evans and Associates (DEA), Inc., talked briefly about the surveying history of the Columbia river, historic NOAA surveys of the river, and showed that some places in the river have not been

surveyed in over 100 years. Mr. Christy presented that the Corps surveys the channel, which is the federally navigable channel regularly for maintenance and does a cross-line service, but do not detect obstructions to navigation. He stated that river pilots use Corps charts, not NOAA charts—thus, only items in the channel are updated, and in 2008, DEA was contracted to perform full bottom hydrographic surveys of the designated critical areas of the Columbia River—they found 65 uncharted dangers to navigation, 1,400 significant features and 400 disproved features. Mr. Christy also talked about challenges with the charting datum—a grading datum, not relative to tides but to metric heights. He also stated that there were problems applying water or tide correctors to data—conventional hydro surveys used tidal zoning to reference stations; and these stations are often in protected areas that may not be exposed to tidal events in the main channel—leading to uncertainty in measurement data. Mr. Christy stated that they converted data points to ellipsoid heights and then into a format used by National Geodetic Survey (NGS) for geoid models, that they loaded the separation model into hydrographic software to obtain depths in realtime for chart datum CRD; the CRD provided the ellipsoid height, and the mutli-beam sonar provided the water depth. He said this process allowed for determining discrepancies, and greatly reduced the uncertainty in the use of GPS water level data, and that DEA compiled existing data sets for a composite bathymetric model of the lower Columbia River to be merged with topographic LIDAR data resulting in the largest single source of composite NOAA data set. Mr. Christy also talked about some of the uses of the NOAA data set for predredge survey conditions, the Lower Columbia River Estuary partnership program, and the Super Fund site in the Portland Harbor. He closed his talk with how collecting data to chart standards, using NOAA products and services relative to the ellipsoid allowed this data to be used for different applications.

Columbia River PORTS®, Sebastian Degens, Port of Portland, provided an overview of the LOADMAX river stage (water level) forecast system for the Port of Portland. Mr. Degens talked about how the LOADMAX provides the maritime industry with real-time and forecast river level data; how the data is used to assist in deeper loading of vessels and reduces transit delays; reduces the risk of groundings, collisions, and allusions for maritime traffic; improves environmental and ecological planning and analysis, as well as river flow management and flood warning. Mr. Degens presented that the LOADMAX system began in 1984, and became a NOAA PORTS® system in 2006. He discussed that the LOADMAX is a cooperative effort between the Port of Portland, NWS River Forecast Center, and the National Ocean Services PORTS® program. Mr. Degens explained the benefit of LOADMAX to allow for more precise scheduling of ship departure and arrival times—you can set in your time of departure or arrival, your draft or desired draft, speed and date, then for the next ten days you can chart what your anticipated clearance would be. He talked about the benefit of river deepening and how having this type data allows for an additional foot of clearance which can result in significant economic benefit. Mr. Degens said the basic concept of LOADMAX is that some times in the year we have a lot more water above the Columbia River datum, and using the LOADMAX information about the water and tide levels, we can provide to pilots information so they can maximize the loads on the vessels—to put it in numbers an extra foot of draft can mean significant cost savings. Some low water

issues that Mr. Degens suggested should be looked at include: advancing bathymetric surveys; increasing the frequency of surveys; advancing the timing of dredging, obstruction removal and other berth maintenance; coordinating to assure the availability of dredge capability; and disseminating the information for use within the maritime industry and other stakeholders in a timely manner. Some new developments he noted include: long-term low flow forecast annually; new gauge under development at Hammond site; and 24 hour local response service through Merchants Exchange switchboard. Mr. Degens presented some suggestion for improvement to include: greater reliability of the Voice Data Response system; implement the AIS features for the data delivery shipboard; recognize that system is being used 24/7 by maritime industry; and fog sensors and air gap sensors.

Closing/Reopening of Columbia River Bar, Captain Douglas Kaup, Commander, United States Coast Guard, Sector Columbia River, presented on the USCG responsibilities in closing and reopening the Columbia River Bar for shipping traffic safety and commerce. Captain Kaup gave a brief history of why regulations were established for the closing and reopening of the bar—since 1992 over 39 vessels have capsized, and 66 fatalities have occurred. He stated that with the Taki Too sinking in 2003, 11 lives were lost, and from these incidents, the CG and the National Transportation Safety Board casualty investigations recommended a need for additional regulations to mitigate the risks associated with ship traffic loss and fatalities crossing the bar. He said that as a result, 33 Code of Federal Regulations (CFR) Part 165.1325 was implemented in December 2009 that states bars, "will be closed to all vessels when environmental conditions exceed the operational limitations of the relevant CG search and rescue as determined by the Captain of the Port (COTP)"—COTP is a position held by the Commander of the U.S. Coast Guard Sector. Captain Kaup also talked about the CG rescue capabilities for the bar—bars are closed when breaking seas are greater than 20 foot; rescue assets can only deploy in less than 20 foot seas, and that the Columbia River Bar is closed to vessel traffic when seas are greater than 20 foot. He said the USCG also has to notify Bar Pilots for bar closures—10 hours notice is required in order to suspend operations on the Lower Columbia River for deep draft vessels. Captain Kaup also discussed the importance and timeliness of reopening the bar to facilitate the flow of commerce, for the fishing industry, and the movement of deep draft vessels. He also discussed that the CG uses NWS forecast and wave buoy data, and visual observation when making the decision for closure/reopening the bar. He talked about issues with shoaling at the confluence of the Hood and Columbia where existing navigation charts showed a 20 foot of depth, but in July 2009, the tank barge New Dawn, with a draft of 12 feet ran aground in 6 foot water depth on a shoal. Captain Kaup stated that the barge was outside the Corps navigable maintained channel, but it was still depicted as navigable water on the chart, and that a survey was requested, but was not conducted until summer 2010. He also presented some navigation information requests of NOAA: additional wave buoy data; improved accuracy of data; and frequent survey of regularly changing shoals. Captain Kaup explained that having additional and improved accuracy of wave buoy data on the sea state will assist the station and the COTP with making more confident decisions for closure and reopening of the bar. Captain Kaup ended his presentation suggesting that NOAA assist safe navigation by

keeping their navigation charts updated in rapidly changing areas such as the Hood River—by keeping charts updated, mariners will have a better idea of non-navigable areas.

Mr. Welch thanked Captain Kaup and the Coast Guard for their many contributions in terms of safety and prevention and response. He asked the Panel if there were questions.

- Dr. Jeffress posed that there were no mention of salinity, and asked if the change in salinity from the Pacific up the river is a problem for draft? And do any stations measure salinity?
- Captain Amos replied that salinity is not much of a problem in the way ships port their draft before they transit up the river—its mostly fresh water further up the river. He indicated that some stations have the ability to measure salinity, and some stations in the lower part of the river would be interested.
- Dr. Jeffress questioned whether draw down in water levels due to large vessels going down whether is a problem for the Columbia River, and does it cause erosion?
- Captain Amos responded that this is an ongoing concern for the Columbia river and the squat tables that determine how far a ship will go down, they do not use them because they work so close to the bottom, and there has not been a definitive study of how squat works or does not work in narrow water ways.
- Mr. McBride questioned what is the impact of the Bonneville Dam as it releases water in terms of whether it affects your currents or water depths? If so, how much and how is that reported?
- Mr. Degens responded that they have modeled the water flow from the Bonneville dam, but it pretty much dissipates when it reaches Longview. Also, he stated that the Bonneville will hold back water because of the power band, and will not fully disclose how they are going to be releasing water—that is proprietary information. He also said that depending on whether Bonneville releases or holds back, they can see water levels changes by about six or eight inches.
- Mr. Whiting questioned the USACE as to what is their ping to chart time period? He stated that is seems to be a long time, and that NOAA has the same problem—it takes a long time to get the data out, and this should be improved.
- Mr. Littell replied to Mr. Whiting's question that in reference to the time for NOAAA charts from ping to publication depends on assets available for surveying, weather conditions, and coordination of data sets for matching.
- Captain Kaup encouraged that he would like to see a NOAA rep on the Harbor Safety Committee to help make things happen when areas on the river need to be surveyed.
- Captain McGovern had two questions: (1) when do they do their surveys, do they just do the federal channel or can you also do the natural channel? (2) Jacob, you are making your GIS compatible or using layers form the ENC's—can that work the other way around in that the extra layer you produce could potentially be put on an ENC?

- Mr. Littell responded to Captain McGovern's questions—as far as survey of the federal channel, they try to survey the Columbia River channel monthly; above Vancouver, where there isn't shipping traffic, those survey only happen a couple times a year, we do not cross line channels. He also stated that all this data is available, collected on a regular basis, processed and sent to NOAA for updates on the charts.
- Mr. Dasler questioned if the channel line surveys are single-beam or mutli-beam? And are those charts electronically available to the pilots?
- Mr. Littell replied it single-beam data, in pdf format and is downloadable data.
- Mr. Dasler further questioned Captain Amos that he commented about visibility sensors, and is this something that is provided by the NOAA PORTS® system?
- Captain Amos replied, yes the sensors along the river have the capability to place visibility sensors, fog sensors on them, but they do not currently have them, and the pilots would like to have them because Portland is where we have lots of fog and narrow channels.
- Mr. Edwing responded that NOAA had two of these sensors operating down in Mobile, recently finished operational testing, and that these sensors will be available this year to be added to other PORTS®.
- Mr. Dasler made two comments he wanted noted: (1) the recognition that the Columbia River datum has been an issue for some time; the wave of the future will be cell phone capability of two-centimeter vertical accuracies; real-time height information aboard ships, and real-time observations on the ships relayed to AIS—and with the changes in technology, it's critical that everyone gets on the same page, surveying the same relative data; these changes will resolve a lot of issue and problems; GPS heights will be a good way to approach the problems with datum measurements; (2) on the NOAA surveys from the standpoint of dangers to navigation, these take a very fast track; our hyrographers are out there collecting half-meter grid density data; this is sent off to Hydrographic Surveys Division; the charts get updated within a week; we download the updates weekly—usually within a week of identifying the danger to navigation; but there's a lot of data and we are working on improving that.
- Mr. Welch asked Captain Amos to elaborate on the Coast Guard Research and Development center funding issue; what were they trying to do; and do they have any estimates as to how much money is needed to finish the project?
- Captain Amos replied that the CG began the study in Tampa Bay, expanded to the Columbia River to see how the information would transfer and interact with the two relay stations we have. USCG stated they had funding until June 2010 and this project was funded through the Vessel Traffic Service area of the CG. But, the Commander who runs the VTS is unwilling to put money into the Columbia River effort because it is not a VTS area of the CG. Captain Amos further estimated that it would take about $200,000 to round out the study. He did state that the pilots would like some additional information: air gap sensors and get the data displayed properly; different graphic user interfaces so we can see the results of the surveys at a glance versus trying to study a chart.
- Mr. Welch asked Captain Amos to write up a three or four paragraph summary of what the pilots are trying to accomplish and submit it to the HSRP.

- Captain McGovern raised the point that the issue with the information carried over the AIS is not a local issue, but rather a national issue. He stated that with the coming carriage requirements that came out of the IMO, all ships are going to have to have this and the easiest way to get this information is from the PORTS® system; and there is an AIS data stream specifically for environmental information. Captain McGovern further stated that even with a tight budget, this is something that should be continued.
- Captain Amos responded that this is a national issue, a national product and without the funding we still have on the river an incomplete format.
- Dr. Jeffress pointed out that if funding for PORTS® maintenance benefits the Midwestern states through transiting the Columbia River system, and their exports are in the billions of dollars through the port system, the entire nation benefits—then, why is NOAA not funding the PORTS®?
- Captain Lowell stated that NOAA appreciates what the Corps had done in getting their information into a common format and thanked them for getting the channel framework done. He said that when the Corps creates a paper product and you overlay it with our vector product on top, they match—this is a major success in sharing this data between federal agencies. He also noted that when pilots go out and get a different vendor to create their software package, it challenges an organization that is supposed to creating a standard product on a national scale and to be able to deliver custom focus products for a local region—the capacity is very difficult to do this. The more customization and specific regional work we do in any one area means we are not doing it somewhere else or something is going off the table. Captain Lowell also stated that we are moving into a new fiscal environment that is becoming very tight; we will need to make hard choices; create efficiencies; and work together with our federal and end users to get this data out in an efficient manner.

Mr. Welch thanked the Columbia River Panel speakers for their participation and stated that the Panel will consider their input as they develop recommendations as an advisory committee for NOAA Leadership.

Building a Blueprint for Tidal Wetland & Salmon Habitat Restoration in Oregon in Collaboration with NGS and CO-OPS, Laura Brophy, Estuary Technical Group, Institute for Applied Ecology, presented a talk on tidal wetlands and salmon habitat restoration in Oregon. Ms. Brophy stated that her program was in collaboration with NGS and CO-OPS, addressed some of the objectives of the national ocean policy, and develops tools to detect, prevent and reverse the impacts of coastal pollution and habitat degradation. She stated that this project was funded by the Cooperative Institute for Coastal and Estuarine Environmental Technology program of NOAA and the University of New Hampshire, and that the program focuses on assembling the development of innovative technology to help solve coastal resource management problems. Ms. Brophy discussed that the goals of this project were to: develop new methods for measuring ecosystem driver in tidal wetlands; and analyze and distribute the resulting reference site data to help improve restoration results. She talked about why the data is needed—from 60% to 90% loss of tidal wetland in Oregon, and

discussed some objectives: choose new reference sites to characterize least-disturbed conditions; test new technologies and model inundation regimes; and compile and disseminate pilot reference conditions database. Ms. Brophy talked about the critical controlling factors in tidal wetland ecology and their impacts and how current measurement methods are expensive and lack adequate spatial or temporal resolution. She further talked about collaborative testing technologies; high precision surveying; determining tidal datums and inundation regimes; how the project compiled and correlated data on controlling factors, soil characteristics, and biology—resulted in a reference condition database where data is in use. Ms. Brophy discussed the collaborative partnerships that are using this NOAA-generated data, funding sources for the project, and future potential partnership to apply the NOAA data. Ms. Brophy pointed out the tremendous support from NGS setting up the monumentation at the study sites. This effort, she said resulted in very accurate information; allowing us to obtain high accuracy elevation data that we tied to the water levels and bring together the geodetic and tidal datums. She further stated how crucial this NOAA data has been to the development of the project, and that she is really appreciative of NOAA's involvement.

- Mr. Whiting questioned what was happening with climate change in the raising of the ocean level—how it was affecting those tidal wetland systems?
- Ms. Brophy responded that the tidal wetland systems are located where tides inundate, and Oregon has a big range in tide levels—she stated that a small change in sea level would results in a high loss of tidal wetlands; and have a major impact on the salmon spawning, as well as, sediment distribution and nutrient pollution will also have significant impacts.
- Mr. Dasler questioned if they were looking at subsidence as an issue?
- Ms. Brophy replied that the least disturbed sites have not under gone radial subsidence like when you dike a site; but if these sites were diked—the restoration sites could be underwater. But, she stated so far subsidence is not a big issue.
- Mr. Kennedy questioned about whether she experienced success stories and failures with her 17 projects—that NOAA could better understand what works and what doesn't work.
- Ms. Brophy replied that the drivers for restoring wetlands are fairly predictable; we are getting channel system development, and yes we have good success with rebuilding structure, and we are still trying to characterize our success with return of function.

Mr. Welch thanked Ms. Brophy for her presentation.

Public Comments

Ms. Holly Lopez, hydrographic surveyor and GIS analyst with Fugro, California. Ms. Lopez stated that Fugro has performed aerial mapping of the entire West Coast for the Army Corps of Engineers as part of their national coastal mapping program. She said this survey involves bathymetric LIDAR, topographic LIDAR, aerial photography and hyper spectral imagery, and that it extends approximately 500 meters inland and

1000 meters offshore, and that subject to water clarity, these data will help fill the gap between vessel base survey data and the beach. She stated that Fugro supports the efforts of the WCGA and hopes to engage in future mapping programs. Also, she stated that Fugro was involved in a very successful California mapping program and would like to be involved in the Oregon and Washington program as well.

Mr. Welch asked Ms. Lopez to give a brief overview of Fugro.

Ms. Lopez stated that Fugro is an international company that has offices throughout California, Mississippi, Alaska, Spain and Abu Dhabi. However, she works out of the Oakland, California office. Furgro, she stated provides hydrographic services, multi-beam, side scan, topographic and bathymetric LIDAR services.

Mr. Welch reiterated his appreciation to all the speakers of the day. The Panel was fortunate to have Dr. Robinson representing NOAA Leadership give the Panel some information on NOAA priorities relating to the national ocean policy and how navigation services play a role. He stated that Mr. Kennedy gave the Panel some information particularly as to NOAA's role in the Deepwater Horizon response. He further stated how the Panel learned quite a bit about the West Coast Governors' Agreement on Ocean Health; the collaborations and partnership; and the Columbia River Stakeholder Panel brought the Panel up to date on how essential the Columbia River is to the nation's economy, and how valuable NOAA's various navigation services enhance their ability to use this waterway. He also pointed out how Ms. Brophy's presentation about NOAA's information helps with vital wetland restoration projects.

Discussion Points Raised by the Panel

Mr. Dasler suggested as a possible recommendation that NOAA pursue how they may be able to get funds from some of the mitigating program from Deepwater Horizon to fund updating of models and water charts in the Gulf of Mexico to support trajectory models.

- Mr. Welch stated that it may be a good idea for the Panel to encourage NOAA to take sort of a liberal view of those types of things Mr. Dasler mentioned and not be hesitant about asking for reimbursement.
- Captain McGovern suggested that NOAA try to get the standard survey so that others can use the data.
- Mr. Dasler questioned Dr. Robinson as to what recommendations could the Panel make that would help NOAA in its endeavors with the political and budgetary process.
- Dr. Robinson responded that NOAA welcomes any comments they get from the community and that the Panel should point out that the recommendations are informing the Administrator that also sits on the National Ocean Council and interacts with supporters on Capitol Hill. He further suggested that the

HSRP recommendations should also be translated or transmitted from her to the National Ocean Council so that these 27 agencies get to hear them.

- Mr. Welch suggested that the Panel also use the statistics from Colonel Miles about the value of trade coming from the Midwest states to the Port of Portland and the Columbia River system—how the port system has streamlined and made transportation more efficient and safer, less collisions, less groundings and has benefitted an entire nation using those numbers.
- Ms. Brophy suggested some recommendations that NOAA prioritize partnerships with organization that are developing focused scientific data to support tidal wetland conservation and restoration efforts in the Pacific Northwest.
- Mr. Welch suggested that the Panel ought to consider saying something about the funding project issue that Captain Amos brought to the attention of the Panel.
- Mr. Dasler suggested that the Panel reemphasize the important use of VDATUM and datum transformations.

Mr. Welch asked if there were any closing remarks or comments.

Dr. Robinson stated that he wanted to thank Mr. Kennedy for his leadership he provided during the Deepwater Horizon response effort—it was of unprecedented proportions. He stated that Mr. Kennedy was in the trenches from day one, and that there are some lessons learned of how to deal with crisis. Dr. Robinson further stated he wanted to go on record acknowledging Mr. Kennedy's unprecedented leadership during this time. He also thanked the Panel and suggested they provide concise recommendations, backup and rationale—this would be very important.

Mr. Kennedy discussed that this was his first HSRP meeting and listening to the presentations and discussions he felt this Panel has a prime opportunity to step forward in leadership and provide important advice on relevant issues supporting ocean policy and marine spatial planning—positioning the Panel and activities to play a significant role in the Administration's policy.

Captain Lowell in closing offered a suggestion to the Panel, that we are typically over focusing on the troubles and what's not working, rather than what's working—navigation services typically work fairly well, and because they work fairly well we don't get a lot of attention.

Mr. Welch stated in agreement and officially closed the meeting.

Meeting Adjourned

The HSRP adjourned at 5:30pm

Summary Record
Hydrographic Services Review Panel (HSRP)
October 12-13, 2010
Vancouver, WA

Wednesday, October 13, 2010

Northwest Regional Stakeholder Panel

Use of High-Resolution Multi-beam Sonar Data in Management of Nearshore Biological Resources, David Fox, Oregon Fish and Wildlife, demonstrated via slideshow the usefulness of various NOAA products and services in fishery and marine preserve research and management along the Oregon coast and its estuaries. Of particular interest were the imaging and mapping instruments, used to determine and discover bathymetric and biotic density data, which is then applied toward a better understanding of fish behaviors, populations, and habitats. Mr. Fox emphasized the importance of ground truthing—determining underwater topographical features directly—in nearshore areas—waters too shallow for common vessels to navigate. Mr. Fox concluded the presentation with a Q&A session, in which he affirmed that the uses he described were applicable to similar work in other regions, and in which he described various web-based systems in development intended to disseminate research and encourage community involvement in maintaining marine bioregions.

Commercial Fishing Uses of NOAA's Navigation Products, Scott McMullen, Oregon Fishermen's Cable Committee (OFCC), explained the purpose of his organization—to chart submersed cables for the avoidance of commercial fisherman—and showed slides of examples of West Coast fishing vessels and their routes. He displayed samples of NOAA print-on-demand charts, which he thanked NOAA for extensively, and which he noted were critical to the OFCC fleet's operations, pointing out "they are absolutely up-to-date" and describing various features of the charts. He explained that his organization's fleet uses an electronic plotting program that incorporates an NOAA chart as its background. Mr. McMullen further thanked NOAA for their free downloadable charts and for their assistance updating charts for an important industry trade show. Mr. McMullen concluded his presentation by detailing several suggestions for improvements of NOAA's electronic charts, including: clarifying gaps in cable markers, which he called "cable corridors"; e-mail alerts for chart updates; digital copies of master charts available on disk; imbedded hyperlinks; and supplemental layers displaying various types of relevant data collected by the implementation of new technologies—many of which, both layer types and technologies, he named specifically. There was Q&A with the Panel regarding Mr. McMullen's suggestions.

Offshore Renewable Energy, Meleah Ashford, Oregon State University, explained the purpose of her organization—to research and develop means for harnessing renewable energy from marine/coastal environments—and showed slides of examples of various experimental and theoretical energy-harnessing mechanisms. Meleah emphasized the importance of NOAA hydrographic data in planning the placement and implementation of mechanisms for harnessing energy from waves and other ocean fluid-dynamic resources; proper placement of such mechanisms requires knowledge of marine floor depth, stability, and form, as well as an apprehension of environmental, social, and economic impact (aquatic life, commercial fishing, and tourism). Meleah's talk followed with Q&A regarding institutional interests and obstacles related to the future of coastal/tidal renewable energy.

Data Models and the Role of NOAA Hydrographic Services Products in the Lower Columbia River and Estuary, Keith Marcoe, Lower Columbia River Estuary Partnership, began by explaining the purpose of his organization—to improve the water quality and restore the habitat of the lower Columbia River at a watershed level, as one of 28 national estuary programs established by the EPA in 1987. He said each program is tasked with writing comprehensive conservation and management plans to meet the goals of Section 320 of the Clean Water Act, and that the primary objectives of the management plan entailed education and information dissemination to a variety of audiences, from governmental agencies at various levels, to volunteer programs, to environmental education interests of all types—to raise awareness and provoke suitable action. Mr. Marcoe provided a detailed historical context of the region's ecology and implications for its future and presented various slides of NOAA maps and graphs his team used in support of data models they were developing.

Height Modernization Efforts in Washington State, Dave Steele, Washington Department of Natural Resources, described "height modernization" and NOAA's role in building geoid models to expand on the applications of GPS technology and improve spatial mapping generally. His work with The Spatial Reference Center—a nonprofit organization set up to obtain grant funding to improve and modernize the geodetic network—has focused on developing an active control network of GPS stations dispersed across Washington State, called the Washington State Reference Network. Mr. Steele presented slides depicting topographical maps while discussing the methods and devices used for data collection and detailing corresponding elevation measurements.

Oregon Coast Charting, James Coleman, David Evans & Associates, Inc., began his presentation by showing photographic slides of the Oregon coast, commenting on the geological features, both specifically and generally and then showed a slide of a nautical chart of the coast line, noting its low resolution due to its source, B-4 surveys were done between 1900-1939. Mr. Coleman explained that the slide was of a smooth sheet from a survey done in 1927 and commented that NOAA was a "fabulous resource" in that one can go onto the web and download such a document. Mr. Coleman explained that his organization was tasked by NOAA via the West Coast Governor's agreement to update the survey, creating eight sheets spanning from Cape

Perpetual to Tillamook Rock—what he referred to as "the Oregon Coast Mapping Project." He demonstrated, via slideshow, discoveries of variations and omissions of geological features in the old survey that the new survey corrected for. He concluded the presentation by describing in detail, again using slide representations, a range of NOAA technologies and methods used to achieve accurate charting for the new survey.

Marine Operations Center-Pacific Relocation to Newport, Oregon, Captain Donald W. Haines, Commanding Officer, NOAA Ship RAINIER, Office of Marine and Aviation Operations Pacific, Seattle, gave a brief overview of the NOAA fleet, the Marine Operations Centers—in Norfolk, Virginia and Seattle, Washington—and the governmental chain of command pertaining to NOAA. Captain Haines addressed reasons for relocating the Pacific center as well as bureaucratic complications regarding leasing and location assessments, including an IG investigation of the relocation process. He showed slides of burnt piers from a 2006 electrical fire at the current Seattle location, an artist rendition of the future center, progress of the new site (prep, construction) in Newport, Oregon, and explained the logistics of the transition, including the hiring and training of personnel, particularly in regard to maneuvering vessels through the precarious waters. Captain Haines concluded the presentation with a brief description of NOAA's supporting role in times of emergency, such as charting the shoreline devastation caused by Hurricane Katrina and assessing the damage of the Haiti earthquake. There was a brief Q&A session regarding political/bureaucratic contentions and then the panel took a recess for lunch.

Public Comments

Mr. Goldfinger addressed the notion that he and many of his colleagues were specialists and practitioners of nebulous tasks regarding the charting and mapping of data for various purposes, all of which were worthwhile but not explicitly commissioned under the authority of a specific entity, federal or otherwise. Therefore, continental shelves were not being mapped in a comprehensive, systematic way, rather in "postage stamps" funded by discrete institutions for isolated projects. He suggested the panel consider if there was any way to "bring NOS into the game, think more about ecosystem applications and even natural hazard applications, and perhaps broaden the role."

Ms. Seekins identified herself as the GIS coordinator/analyst for the northwest region of NOAA fisheries—the only full-time GIS person from that agency, supporting approximately 200 people—and explained that in her projects, developing critical habitat data for marine species, she wanted everyone to be aware of her great need for NOAA's bathymetric data and that ease of access was of primary concern. This applied to her colleagues and counterparts elsewhere as well.

NOAA Updates

Center for Operational Oceanographic Products and Services (CO-OPS), Richard Edwing, described accomplishments of the 2010 fiscal year and expectations/plans for the 2011 fiscal year:

- Integrated wave buoy data into PORTS® systems in partnership with USACE and SCRIPPS Institution of Oceanography.
- Installed visibility sensors at two PORTS® locations for measuring fog.
- Published Columbia River PORTS® Economic Study—estimated a $44.9 million in direct annual economic benefits.
- Improved Nowcast and Forecast Hydrodynamic models; upgraded and retrofitted others; Mr. Edwing listed and described some of these locations and systems.
- Updated Tidal Current Predictions; NOAA Tide Predictions 3,000 location easily accessible via the web.
- Real-time Active Current Station Data—enhanced functionality of web-based products for ease of access and use.
- Produced a number of technical reports; put out a manual on guidance and planning for sea level rise; produced impact statements for major storms—ongoing.
- Completed structural upgrades of National Water Level Observation Network—ongoing; Mr. Edwing noted new partnerships.
- Adapted PORTS® and QuickLook data products and accelerated the development of a northern Gulf of Mexico hydrodynamic model for use by NOAA and other Federal agencies in response to Deepwater Horizon oil spill; Collaborated with NGS and Coast Survey to support charting and shoreline mapping—ongoing.
- Ended with brief Q&A

National Geodetic Survey (NGS), Ronnie Taylor, gave a brief update on the year's accomplishments, upcoming events, and budget issues:

- Hosted first federal geospatial summit to share information with other federal mapping agencies to propose improvements to the National Spatial Reference System (NSRS); also included plans for replacement of NAD (North American Datum) 83 and NAVD (North American Vertical Datum) 88.
- NGS began operational phase of the Gravity for Redefinition of the American Vertical Datum (GRAV-D) started in Alaska; will continue flying in Alaska until end of November, then to San Francisco and Sacramento.
- NGS improved infrastructure for precise positioning in Alaska; added 20 CORS stations to fill critical gaps and could add up to 50 more in FY11.
- NGS released real-time guidelines to provide definitive criteria to achieve various specific tiers of precision for use with the Global Navigation Satellite System.
- Conducted over 60,000 baseline (pre-impact) shore and damage assessment images of coastal areas impacted by the Deepwater Horizon oil spill.
- Added 100 CORS stations to network in FY09-FY10.
- Because of Deepwater Horizon, only mapped 21 of 28 priority ports; plan to complete those 7 in 2011.
- Released VDATUM national program plan—expansion of National VDatum planned for 2011.
- County scorecard ratings and expectations—currently at 78%; shooting for 83% in FY 2011; metric to assess how NGS is enabling local capacity for accurate positioning.

- Budget; no changes this year.
- Will continue collaborating with partners on CORS (Continuously Operating Reference Stations).
- Plans to complete a social economic benefit study for remote sensing products and services; did one for geodesy program, was successful.
- Would like to conduct a biannual gravity station comparison in the U.S. at Table Mountain going forward.
- Ended with Q&A for clarification of details.

Office of Coast Survey (OCS), Captain John Lowell, gave a brief overview of OCS activities:

- Mariners will be required to have Electronic Navigation Chart (ENC) systems on their ships; all hydrographic officers will be required to provide data and fuel to run the systems.
- Added 72 ENCs, totaling 772—nearly full coverage; 100% of all 175 major U.S. ports, 90+% interconnectedness of those ports; weak coverage in Alaska and Pacific islands.
- Acquisitions: 4,500 square nautical miles of hydro data.
- Recently released 3-year LIDAR contract to vendors for filling in nearshore data.
- The NOAA ship *Hassler* (*Rudy* replacement) is not online yet; NOAA terminated contract for default; NOAA in possession of ship; vendors didn't meet specs—too heavy; current plan to go through ABS and Coast Guard inspections by April 2011; have ready for 2012 hydrographic field season—limited operations; more studying and design work to do.
- OCS Navigation Response Team 5 conducted sidescan and multibeam surveying for Maine fishing communities in response to Stakeholder and political request for full bottom surveys of the Cobscook Bay area from significant loss of life and vessels.
- OCS navigation services supported Deepwater Horizon response efforts with collecting hydrography for oil spill trajectory maps and coastal survey models to determine movement of oil.
- Alliance for Safe Navigation—a recent poll indicated that only 36% of recreational boating respondents said that they "were concerned about the accuracy of the data used for navigation." OCS is working to build awareness that up-to-date navigational aids are important for safe recreational boating.
- OCS is making progress in surveying the Arctic; 674 square nautical miles of hydrographic data was acquired in 2010.
- NOAA is a representative on the Arctic Regional Hydrographic Commission—consisting of Canada, Denmark, Norway, Russia and United States.
- Ended with Q&A.

Comments

Dr. Jeffress spoke briefly of a new technology, unmanned aerial systems for data collection. Ms. Brophy requested assistance resolving issues with VDATUM, as well as an increase in the number of NOAA stations along the Oregon coast, and help linking

bathymetry data to terrestrial elevation data. The remainder of the time was taken up with the business of membership status, appointments, and terms.

Panel Discussion of Recommendations

The HSRP discussed recommendations to include in a letter to Dr. Lubchenco:

- NOAA should consider petitioning Congress for funding NOAA technologies in the planning of new infrastructure projects, nationally; reimbursements for expenses incurred during the Deepwater Horizon disaster; and initiatives NOAA might undertake in navigation services or mapping the impact on the Gulf.
- NOAA should support the maintenance and operation of the national PORTS® system.
- NOAA should continue to expand its efforts to deliver its navigation products and services more quickly and make potential users more aware of available resources.
- NOAA should consider the enhancements suggested by the Stakeholders' regarding the web-based charts and maps and should be more responsive to user requests for enhancements.
- NOAA hydrographic and nautical services and products should support the objectives of the National Ocean Policy Task Force.
- NOAA should emphasize funding for continuing to develop VDATUM.

There followed a brief discussion of various details of NOAA's navigation products and services, ideas for further recommendations, and final brief exchanges about future HSRP business, including membership and budget issues, meeting locations, and political implications.

Closing Remarks

Mr. Welch thanked staff, colleagues on the panel, and other participants in the meeting.

Meeting Adjourned

The meeting was adjourned at 5:00pm

Voting HSRP Members in Attendance

Jonathan Dasler	Director of Hydrographic Services, David Evans and Associates, Inc.
Dr. Gary Jeffress	Professor of Geographic Information Science, Texas A&M University – Corpus Christi
R. Adam McBride	Port Director, Lake Charles and Terminal District (Retired)
Captain Andrew McGovern	Sandy Hook Pilots Association
Captain Minas Myrtidis	VP, Fleet Regulatory Compliance, Norwegian Cruise Line
Thomas Skinner	Senior Project Manager, Durand & Anastas Environmental Strategies, Inc.
Edmund Welch, HSRP Acting Chair & Vice Chair	Independent Consultant for Maritime and Ocean Policy; Passenger Vessel Association
Matthew Wellslager	Program Manager, South Carolina Geodetic Survey
Larry Whiting	TerraSound, LLC (Retired)

Voting HSRP Members Not in Attendance

Elaine L. Dickinson	Boat Owners Association of the United States (BoatUS)
Captain Sherri Hickman	Houston Pilots Association
Captain Tom Jacobsen	President, Jacobson Pilot Service, Inc. & Bay Survey Enterprises, Inc.
Captain Ramón Torres Morales	Port of Las Americas Authority
Rear Admiral Richard West, U.S. Navy (Retired);	Past President, Consortium for Oceanographic Research and Education (CORE); former Oceanographer and Navigator of the U.S. Navy

Non-voting Members in Attendance

Andy Armstrong	Co-Director, Joint Hydrographic Center, NOAA
Ronnie Taylor	Acting Director, National Geodetic Survey (NGS), NOAA
Richard Edwing	Director, Center for Operational Oceanographic Products and Services (CO-OPS), NOAA

Designated Federal Officer

Captain John E. Lowell, Jr.	Director, Office of Coast Survey (OCS), NOAA

West Coast Governors' Agreement (WCGA) Stakeholder Panel

Dr. Chris Goldfinger	WCGA Seafloor Mapping Action Coordination Team, Oregon State University
Mrs. Jessica Hamilton-Keys	Natural Resources Policy Advisor, Governor Ted Kulongoski's Office Oregon
Dr. Sam Johnson	WCGA Seafloor Mapping Action Coordination Team, U.S. Geological Survey
Mr. Eli Levitt	WCGA Climate Action Coordination Team, Washington Department of Ecology, Climate Policy Group

Columbia River Stakeholder Panel

Captain Paul Amos	Columbia River Pilots
Michael Christy	David Evans & Associates, Inc.
Sebastian Degens	Port of Portland
Captain Dan Jordan	Columbia River Bar Pilots
Captain Douglas Kaup	Commander, United States Coast Guard, Sector Columbia River
Mel Littell	U.S. Army Corps of Engineers
Jacob Watts	U.S. Army Corps of Engineers

Northwest Regional Stakeholder Panel

Meleah Ashford	Oregon State University
James Coleman	David Evans & Associates, Inc.
Dave Fox	Oregon Fish and Wildlife
Keith Marcoe	Lower Columbia River Estuary Partnership
Scott McMullen	Oregon Fishermen's Cable Committee
Dave Steele	Washington Department of Natural Resources

Other Speakers

Dr. Larry Robinson	Assistant Secretary of Commerce for Oceans and Atmosphere, NOAA
Colonel Steven R. Miles	U.S. Army Corps of Engineers
David M. Kennedy	Acting Assistant Administrator, National Ocean Service (NOS)
Ms. Laura Brophy	Estuary Technical Group, Institute for Applied Ecology
Captain Donald W. Haines	Commanding Officer, NOAA Ship *Rainier,* Office of Marine and Aviation Operations Pacific, Seattle

Staff

Paul Bradley	National Ocean Service, Policy, Planning & Analysis Division
Virginia Dentler	Center for Operational Oceanographic Products and Services (CO-OPS)
Tiffany House	National Geodetic Survey, NOS
Kathy Watson	Office of Coast Survey, NOAA

Others Attendees /Public

Rebecca Arenson	NOAA, Office of Coast Survey
Doug Brown	NOAA, National Geodetic Survey
David Elson	NOAA NWS Portland
Mercedes D. Esdey-Heydorn	Andreas
Danny LeBlanc	United States Coast Guard
Holly Lopez	Fugro
Crescent Moegling	Hydrographic Services Division, Pacific Hydrographic Branch, OCS
Darra Nelson	Public
Gary Nelson	Chief, Pacific Hydrographic Branch, Hydrographic Services Division, OCS
Roger Parsons	NOAA, Office of Coast Survey
LT Matt Ringel	Commissioned Officer, NOAA Corps, Atlantic Hydrographic Branch, HSD, OCS
Andrew Schwartz	Department of Ecology
Barbara Seekins	NOAA Fisheries, NWR Portland
Ken Wightman	David Evans & Associates, Inc