Summary Record
Hydrographic Services Review Panel Meeting
July 29-30, 2008
Sheraton Fisherman's Wharf
2500 Mason Street
San Francisco, CA

Meeting Introduction – Tuesday, July 29, 2008

On the call of the Designated Federal Officer (DFO), Captain Steven R. Barnum, National Oceanic and Atmospheric Administration (NOAA), and after public notice in the Federal Register (Volume 73, No. 131, Page 38989 dated July 8, 2008), the Hydrographic Services Review Panel (HSRP) meeting was convened on July 29-20, 2008, at Sheraton Fisherman's Wharf Hotel, 2500 Mason Street, San Francisco, CA. All voting members attended except Capt. Andrew McGovern, Capt. Minas Myrtidis, and Mr. Torres-Morales. The following report summarizes the deliberations of that meeting. Documents available to and or prepared by the HSRP are available for public inspection via the web at http://www.nauticalcharts.noaa.gov/ocs/hsrp/hsrp.htm and 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. A list of the HSRP members and other attendees is provided in Appendix 1. Note: In this summary document the capitalized word "Panel" refers to HSRP Panel.

Welcoming Remarks:

Captain Steve Barnum, the Designated Federal Official of the HSRP, began the meeting with a quick description of the HSRP "Panel" and its mission before passing it over to Mr. Jack Dunnigan, National Ocean Service (NOS) Assistant Administrator. Mr. Dunnigan briefly spoke about the importance and history of California with regard to coastal mapping. He also spoke about the California marine sanctuaries, marine transportation and the ability to obtain real-time current readings, the Committee on the Marine Transportation System (CMTS), and recent bills in the Senate such as the: Hydrographic Services Improvement Act (HSIA), the National Undersea Research Program (NURP) Act, NOAA's Integrated Ocean and Coastal Mapping (IOCM) Act, National Sea Grant (NSG) Reauthorization and Integrated Ocean Observing System (IOOS) legislation. Mr. Dunnigan pointed out that these bills were defeated in Congress the day before the Panel meeting. He also mentioned approved amendments to the International Hydrographic Organization protocol in which he emphasized how it was important for our hydrographic programs to work collaboratively around the world.

Action Item:

Mr. Dunnigan challenged the Panel to strategically think about how the Panel should prepare its message for the new leadership transition at NOAA and at the Department of Commerce (DoC) level.

Meeting Call to Order:
HSRP Chair, Mr. Tom Skinner, then called the meeting to order and asked each Panel member to introduce themselves (see Attendee List─Appendix 1) and tell a little bit about themselves.

Meeting Summary Approval:
Mr. Skinner discussed meeting minutes and corrections from the March 7, 2008 HSRP Miami meeting and the April 18, 2008, Teleconference meeting. All corrections were noted and the minutes were voted on and approved by all Panel members present.

Overview of HSRP Activities & Meeting with NOAA Deputy Undersecretary:
Mr. Skinner then discussed the Coastal Society annual conference and explained that Roger Parsons put together a panel on Ocean and Coastal Mapping which resulted in dynamic discussions and interactions with the California representatives. Mr. Skinner discussed that the HSRP Chair, Co-chair, and Mr. Bruce Vogt of NOS, all met with Mary Glackin, Deputy Undersecretary at NOAA on March 12, 2008. Ms. Glackin was briefed on the HSRP's Five Most Wanted Hydrographic Services Improvement Report; recommendations from the Miami meeting and April 2008 teleconference call; IOOS recommendations; and PORTS®.

Action Item:
Deputy Undersecretary Glackin encouraged the HSRP to "crosswalk" ideas and coordinate positions with other NOAA FACA committees, and that the HSRP should develop a strategy for working with the new Administration.

Mr. Skinner discussed with the Panel the issues and need for developing a transition strategy for the new Administration and cross-pollinization with other NOAA Advisory Panels.

Action Item:
Mr. Skinner stated that the Panel will be working on developing a strategic plan for transition and cross-pollinization with other NOAA Advisory Panels.

RADM West HSRP Presentation to SAB:
RADM West discussed his presentation before the NOAA Science Advisory Board (FACA committee to the leadership of NOAA) on March 12, 2008. RADM brief the SAB on the critical role and importance of NOAA's hydrographic and navigation services in support of an efficient and safe marine transportation system; the need to strengthen NOAA's navigation services; emergency response capabilities; and joint areas of collaboration between the HSRP and SAB. RADM West said that he had been trying to get a bridge meeting three times but this was the first time it had happened with the key players, and that this could be an opportunity for the HSRP and SAB to work together. Five areas for possible collaboration between the HSRP and SAB were noted for discussion: 1) Future applications of data collected by NOAA Navigation Services; 2) Support for IOCM; 3) Monitor IOOS Development; 4) Research-to-operations in

hydrographic services; and 5) Monitor modernization and fleet recapitalization. RADM West's presentation was noted and received productive feedback from the SAB members.

Recommendation:
RADM West stated that from his presentation before the NOAA SAB—NOAA needs to do a better job of telling people what they do and the importance of their hydrographic and navigation products and services (e.g. a lot of people don't know what hydroservices are and don't realize the important role that NOAA has).

FY09 Budget Update:
Mr. Skinner turned the meeting over to Mr. Dunnigan and Mrs. Chappell to discuss the current NOAA budget situation. Mrs. Chappell presented that NOAA was likely to operate under a continuing resolution for FY09. She went over budget items in the President's FY09 request:

Mapping and charting adjustments to base for inflation:

- $1 million increase to support Ping to Chart improvements to get data from hydrographic survey vessels to the mariner more quickly;
- $700 thousand for Autonomous Underwater Vehicles (AUVs);
- $2 million for VDatum;
- $2 million increase for Electronic Navigational Charts (ENCs); and
- $1.8 million for Navigation Response Team (NRT).

Geodesy adjustment to base increases and $500 thousand carried through for height modernization (a reduction from FY08 because of the earmark that this line typically receives). Tides and currents had adjustments to base and $2 million for Physical Oceanographic Real-time System® (PORTS®) expansion and forecast model funds. Also, there was language in the appropriation bill that said to take action on PORTS® but the dollar amount wasn't added to the bill. In the end it was decided that NOAA would find resources for this action, not in the PORTS® budget but out NOAA's baseline someplace else.

Mr. Dunnigan noted that although there have been some budgets that have been approved by the House and Senate Appropriations Committees', there is not expectation that those are going to be acted on this year. So, NOAA will move into the new fiscal year with a budget that is a continuing resolution, authorizing the continuity of services at the same levels that we had in 2008. Mr. Dunnigan noted that this would be difficult for NOAA because 2008 was a very bad year for NOS and for a lot of the programs that the agency is concerned about. Mr. Dunnigan brought up two thoughts on the new Administration: 1) they will basically throw the budget out and come up with their own budget for 2009; or 2) they will write off 2009 and keep the continuing resolution going and focus their efforts on a budget for 2010 (which Mr. Dunnigan felt was more likely). He added that the Office of Response and Restoration (OR&R) took a $5 million budget cut so NOS is trying to manage that and the situation to fund PORTS® without the money to do it.

Action Item:
Mr. Dunnigan raised a couple of questions to the Panel: 1) What is the Panel's advice regarding our whole approach to deal with the survey backlog? It will take NOAA decades at current funding levels to be able to address the existing backlog and over time many of the observations points that we have are become older and older; and 2) With the demand of expanding our survey efforts to the northern part of the globe—what is the likelihood that NOAA is going to be able to see some real growth in funding to support this need? NOAA could double the funding and really not make the kind of progress that it would like to make. Does NOAA need a new business model or redefine what's important? Mr. Dunnigan said he didn't know what the answer was, but was looking to the Panel for recommendations.

Mr. Welch suggested that the program convince the agency that there are certain items that out to be in the agency request for the emergency supplemental appropriations bill. Mr. Jeffress asked what percentage of the cost does the hydrographic mapping fuel take and Mr. Dunnigan responded that while he did not have the exact numbers that it would be safe to say that the panel would not be able to believe that NOAA could continue operation at the levels that they've been operating at with the rise in fuel costs. Mr. Dassler stated the Mitchell refuel is about a half million dollars and that the RAINIER is about the same and that this was pretty significant. RADM West asked if the Panel operations were still intact and if there was any impact to the program since the bill with the HSIA appropriations didn't pass. Mr. Dunnigan said that they had been working from a base of $30 million that we could use to meet a number of needs. This year, that was only $8 million so NOS is not in as good shape to be able to manage their way through.

RADM West said that the Panel should tackle the overwhelming needs of the new and current survey backlog issue. Mr. Dassler agreed and stated that public awareness of the age of the data on the charts was necessary, as well as, an understanding from the public that just because there is a white spot on the chart that that doesn't mean that there isn't a significant shoal in that area—it may be that there is no data there.

CMTS National Strategy Report:
Mr. Dunnigan provided an update on the Committee on Marine Transportation System (CMTS) National Strategy report. Mr. Dunnigan stated that the CMTS was a new committee established to take on where the old Interagency Marine Transportation System (IMTS) left off and that the commitment of U.S. Department of Transportation's Maritime Administration (MARAD), NOAA, U.S. Coast Guard (USCG) and the U.S. Army Corps of Engineers (USACE) as the lead agencies to make this effective has been great. The National Strategy for the Marine Transportation System: A Framework for Action is now a public document on the web (http://www.cmts.gov/) and it's going to be adopted by the president. Mr. Dunnigan credited Helen Brohl for its success in bringing the agencies together to create this document. One example of getting to the core of identifying how the agencies can leverage each other in order to provide better services is: NOAA as the lead focusing on technology and sharing those technologies better—the USCG with Automatic Identification System (AIS), NOAA with the PORTS® system,

and the USACE and others with developing new technologies. Mr. Dunnigan, after some discussion, suggested that after the new Administration comes in, to find a way to get the HSRP together with MARAD and talk about issues that the two Advisory committees see as important between NOAA and MARAD, and develop some mutual ways of moving forward. Mr. Skinner suggested that this be discussed in the discussion tomorrow.

San Francisco Stakeholder Panel:
Mr. Skinner introduced the San Francisco (SF) Stakeholder panel. He explained that San Francisco was a unique area for not only navigation and maritime purposes, but also for the estuary and SF Bay and offshore waters. He asked the SF panel to talk about some of the diverse uses of hydrographic data that is relevant to navigation and ocean and coastal mapping. Mr. Skinner asked the SF panel to introduce themselves and provide some background on what they do.

- Jim Haussener, California Marine Affairs and Navigation Conference;
- Jim Fawcett, Sea Grant Ports and Harbors;
- Captain Lynn Korwatch, San Francisco Marine Exchange;
- Captain Marc Bayer, Tesoro West Coast Shipping Operations;
- Eric Van Dyke, Elkhorn Slough National Estuarine Research Reserve; and
- Sheila Semans, California Seafloor Mapping Program and the California State Coastal Conservancy.

Mr. Jim Haussener, California Marine Affairs and Navigation Conference, spoke about being a harbor master, federal agencies and local agencies working together, and the need for real-time, accurate navigation data. He stated that California is the largest exporting state in the US, like all of its infrastructure programs—NOAA's navigation service programs are behind the curve. In California, tens of billions of dollars are needed just for the California Marine Transportation System (MTS). Even with the economic downturn there is still a 7-8% increase overall and lack of funds to dredge.

Action Item:
Mr. Haussener suggested that NOAA provide a central, coordinated, and well-ordered repository of hydrographic information; ensure data continuity; coverage density standards; adherence to industry standards; and increase investment in PORTS® and IOOS.

Mr. Fawcett, Sea Grant Ports and Harbors, discussed two issues: 1) the soundings that are generated by the USACE hydrographic surveys and 2) IOOS. Regarding the USACE data—there are issues with groundings, because there is no way to provide the USACE data to the boating public.

Action Item:
Mr. Fawcett's suggestion was to have NOAA provide interim charting data including the USACE data on the web. With regard to IOOS, he stated that Sea Grant, by virtue of the fact that it is based in a university environment, get involved in how IOOS provides data. He suggested that a useful way of looking at IOOS may be that the need comes first, then

the data vs. with IOOS, the data comes first and then the need is figured out. He suggested that Sea Grant personnel be trained to better connect the information from their users back to the IOOS—an opportunity to leverage within NOAA. Mr. Fawcett, also suggested that Office of Coast Survey (OCS) could help Sea Grant determine how they could help with leveraging capabilities across NOAA.

Captain Korwatch, San Francisco Marine Exchange, discussed how the Marine Exchange of San Francisco is the project manager for the SF PORTS® system. SF PORTS® has incurred funding problems, and functionality and reliability of the system has been problematic. User request for PORTS® system data is exponentially growing and funding is extremely limited—the Marine Exchange is not sure that the SF PORTS® system will continue. Although the Cosco Busan incident raised the visibility of the SF PORTS® system—some of spill response efforts were impacted by a faulty sensor not functioning accurately. At this time, there is not a functional current sensor within the Port of Oakland. The Marine Exchange, in coordination with the USCG, is in the process of installing a current sensor on an eight-foot buoy. Captain Korwatch, also discussed the public/private partnership with Tesoro to "adopt a sensor" where sensors that were previously installed at specific docks can be relocated to other areas in the SF bay.

Action Item:
Captain Korwatch recommended the HSRP look at Federal funding for the PORTS® system.

Captain Bayer, Tesoro West Coast Shipping Operations, discussed the critical issue that his company needs timely, accurate deep-draft navigation survey data to ensure safe passage planning and efficient transit time for the SF bay and up river areas. Their ships lack accurate depths or soundings for some of these areas. They plan their transit depths months in advance. Lack of accurate survey data impacts their cargo loading and size, transit timing, and clearance ability. He stressed that the SF port area is very difficult to work with in terms of geographic features, shoals, air quality, local rules and regulations, and tug escorts. Captain Bayer discussed the benefits of his partnership with the NOAA PORTS® system. With the SF PORTS® system, they have a full weather station and directional current meters with speed readings that help to prevent docking and navigation accidents; they can improve passage planning and the accuracy of spill projectory models; in addition, improve search and rescue efforts. With SF PORTS® data, we can look right into the system and get real-time information and determine whether or not to transit or transfer. Salinity sensors are also very important in the vicinity of shoals because there is a depth measurement difference between salt and fresh water—which impacts transit planning.

Action Item:
Captain Bayer stated the critical need for real-time, accurate sounding and met data. He would also like to see the Ocean Observing System married to the PORTS® system to give people a one-stop shop where they can obtain important information. Additionally, Captain Bayer suggested that PORTS® should be integrated into AIS and electronic

charting along with real-time tide information for improved passage planning, safe transit, and to avoid groundings.

Mr. Van Dyke, Elkhorn Slough National Estuarine Research Reserve, spoke about how NOAA's hydrographic and geodetic surveying data helps to understand habitat issues and the impact of changes in habitat on our lives. Specifically, Mr. Van Dyke discussed how the intertidal area, where both water and land interact, and the elevations that affect our habitats are influenced by the tides and by the elevation of the land. He discussed the benefits of the partnership with the NGS for important geodetic survey technology and Global Positioning System (GPS) data; the Continuously Operating Reference Stations (CORS); the benchmarks; and height mod data for accurate geodetic calibrations. Inundation issues from the tides affect our habitats, and deposition of sediment or erosion, tectonic effects or compaction of sediments—all change the elevation and the surface of the Elkhorn Slough marsh. Benefits of the partnership with Center for Operational Oceanographic Products and Services (CO-OPS) resulted in installation of tide gauges to for water-level monitoring and inundation analysis helps to determine the level of habitat degradation. In collaboration with NGS and CO-OPS, Elkhorn Slough developed and installed a network of "mud-tide gauges" or SET (surface or sediment elevation) tables to measure the elevation of the surface sediment relative to the benchmark. This information helps determine where surface erosion or deposition is occurring, inundation patterns, and helps to determine future conditions of the habitat.

Ms. Semans, California State Coastal Conservancy, gave a presentation on the seafloor mapping in California. She began with the formation of the Ocean Protection Council (OPC). California's response to the Ocean Commission's recommendations for a regional council to look at their ocean governments and how they managed their oceans. The Marine Life Protection Act called for a network of marine-protected areas. In 2005, OPC hosted a mapping workshop of experts that prioritized where and how they should map, what products and standards were needed. End result, a map that showed 66% of San Francisco bay area not mapped. In partnership with state, Federal, academia, and industry (e.g., National Marine Sanctuaries (NMS), California Geological Survey, USCG, and Moss Landing Marine Labs)—a test pilot project was implemented in 2006 that resulted in the California Seafloor Mapping (CSMP) project. Next phase, large-scale implementation of the CSMP includes partnerships with NOAA's OCS and Coastal Services Center (CSC). In October 2007, the CSMP received $15 million for a base map series of data for the state. A Memorandum of Understand (MOU) has been developed with NOS to manage an industry contract to share the support costs for the data collection, and technical oversight and review to ensure that the data collection meets standards—MOU is still not complete. NOS will use the CSMP data to update their navigational charts. Additional partnerships with National Marine Fishery Service (NMFS), NGDC , and IOCM is providing biological groundtruthing; help with storage of large data sets; and integrated, coordinated ocean and coastal mapping efforts.

Action Item:
CSMP recommends continual Federal government assistance for data storage and processing of large data sets; and delivery techniques. CSMP would like to see Bathymetric lidar be tested more in California for nearshore work, and would like to explore AUV capabilities for seafloor mapping.

Mr. Skinner recommended that the Panel develop some recommendations based on the testimony they heard or comments they received. Members of the SF panel brought up the point about meeting data standards, making data available but making the data uncertainty known. The issue of how to deal with NOAA's survey backlog and if there is a plan was brought up again. RADM West stated that the Navy has a survey backlog and felt that NOAA should use digital charts and update their charts electronically including the local information. He also stated that NOAA can't fund everything—that more and more items keep getting added to the pile, but there just isn't enough money. RADM West asked that in addition to telling the Panel what the problems are inform the Panel of some innovative ways to solve the problem. He gave an example, if PORTS® is going to bring in X more dollars then why not take some of those dollars to make that extra foot go away?

Captain Hickman stated that PORTS® is highly desirable—both in ports that have these systems and those ports that want them, but can't afford to fund them. She also stated that the Panel, in the past said that PORTS® should be the backbone to IOOS even more so now that AIS is being integrated with PORTS® (which she asked Mike Szabados to update the panel on).

Mr. Welch suggested those that want to keep PORTS® funded create a document in which they state the implications of having this data or not, and send it to their Senators and Congresswoman Pelosi. The Panel discussed at length the cost of PORTS® in San Francisco and if the cost warranted adding the system in or why it was a problem to fund it if there were nine different counties.

Public Comment Period:
Mr. Toby Garfield, San Francisco State University and the Romberg Tiburon Center in Marin County, asked that the 'ruins' remark on the chart be changed. The Romberg Tiburon Center is listed on the chart as a "ruins' mark. He is working with the NOAA Seascore program to place water-measuring instruments throughout the state; with NGDC for processing the data collection; and providing the data to IOOS. Mr. Garfield expressed his frustration of having to go through four different portals of four different NOAA offices to obtain NOAA's products and services—there is not one portal, but rather several. Further, he explained the issue of latency in the data—when they pass the data to NOAA—the latency can be up to six hours. Mr. Garfield also expressed his interest in obtaining a partnership for an AUV for daily checks on the depths of channels.

Action Item:
Mr. Garfield recommended that NOAA integrate its coastal observing products into one site for user efficiency. Not burden data givers with having them go to multiple places or have users go to different places in NOAA to get data.

Mr. Skinner pointed out that from his experience sometimes the user doesn't know what they want or need.

Heather Kerkering, representing Central and Northern California Ocean Observing System (NCOOS), stated that their priorities were addressing user range between Harmful Algal Blooms, and how to monitor and help provide ocean observing information for recently designated marine-protected area in California. She stated that her group set up a one-stop shop, web-based product where all maritime transportation folks can find information they need for better safety. Ms. Kerkering, further stated that the NCOOS would like to collaborate with other NOAA program offices.

Julie Thomas and Tom Jacobsen spoke about receiving IOOS funds for wave buoy measurements (real-time wave buoys) in the Los Angeles/Long Beach area, and brought up the idea of a National Wave Plan. They also stated that the group should discuss where do we need it? How can we bring it together and how can we collaborate on this? Is this worth expanding to other ports, how do we really get this into the operations of the maritime community?

Discussion continued among the Panel and presenters regarding validation buoys, modeling, ship size, the cost of holding a ship from entering a port etc.

Action Item:
Ms. Thomas stated that high-directional wave data is needed in the US

Captain Barnum stated that the process for contracting hydrographic services and contracts for drafting nautical charts had been requested. Captain Barnum briefly explained that NOAA defines the contract area and area to be surveyed. It is then advertised on FedBizOpps. Companies' submit their qualification packages and the most qualified firm is selected.

Mr. Enabnit gave a presentation on NOAA's raster navigation charts and procurement process. He explained that the electronic version of raster navigation charts is now provided free over the internet. In 2005, the contract agreement with NAVTEG (current provider of raster chart production) ended. NOAA is leaving the raster charts posted, but they are not being updated for Notice to Mariners, or for new editions and the weekly update service is also not functioning. NOAA will regain control of the format and the production capability. Once NOAA re-establishes the production capability, they expect to re-evaluate the situation concerning whether to use contract labor or to conduct this operation internally. Mr. Enabnit, also spoke about print on demand charts. NOAA, due to computer security issues will have to switch to a producer agreement. NOAA is hoping to have more than one partner so that it helps NOAA against a single point of

failure. NOAA sees this as a good motivator to produce just Electronic Navigation Charts (ENCs) and move out of producing raster navigation charts.

Captain Barnum brought NOAA's collaboration with the Center for Coastal and Ocean Mapping at University of New Hampshire (UNH). Develop a risk tool to look at AIS, vessel types and where the ships are going. Then combine that with the age and vintage of hydrography to help guide NOAA where to prioritize surveying.

Mr. Skinner asked the Panel about recommendations to the VADM and asked Ms. Dickinson if she had anything. She stated two issues: 1) Print on demand (POD) is not very well known by the public and 2) problems with having one vendor. She felt that there isn't going to be a lot of competition since it is a highly specialized skill to do these charts. Mr. Skinner asked Mr. Enabnit to speak about the print on demand background and why NOAA chose a vendor to do the printing. Mr. Enabit spoke about NOAA's new production system called the 'Nautical Chart System II' coming online, and then handed the floor over to Mike Serafin to talk about being a chart agent and PODs. Mr. Serafin spoke about the initial struggles with the PODs, but now says it works well. Printing is easy, they don't have to have tons of stock on hand of all the charts and the corrections to the chart are done for you. Mr. DeGree, from OceanGrafix, the company that currently does the PODs, was the next to speak. He stated that the use of PODs has grown and suggested that NOAA consider allowing them to print the POD on both sides (i.e. make the size smaller and fit one part on one side and the rest on the back). He also pointed out that 79 % of recreational mariners didn't know what a new edition was or what it did or what it was for and at the same time 42% don't know what a Notice to Mariner is and 39% don't use them. Clearly, these numbers indicate the point that updated nautical data and safe navigation is not getting out to the recreational mariner. Mr. DeGree stated that the litho and POD chart have become competitors with one another which is unnecessary.

Action Item:
Mr. DeGree recommended that NOAA back up their commitment with charting vendors to allow for chart printing improvements, and emphasize and educate the marketplace on the importance of their charting products to avoid confusion and save money.

Discussion regarding PODs continued with both sides of the issue raised regarding the positives of having redundancy (i.e. other vendors) and hurting a very small company which is specialized and has been making the PODs for several years.

Captain Barnum spoke about the major undertaking of the Nautical Chart System II and how it will give NOAA the ability to re-scheme the charts. Then, he asked Mr. Enabnit, who attends the International Maritime Organization (IMO) Navigation Subcommittee meetings, to talk about Electronic Chart Display and Information System (ECDIS) and E-Navigation. Mr. Enabnit spoke briefly about the mandatory carriage requirement of ECDIS, the re-draft of the Safety of Life at Sea regulation and E-Navigation which is an initiative to try to integrate the bridge system and AIS.

LCDR Van Den Ameele, Chief of the Hydrographic Systems and Technology Program, was asked to talk about surveying on the ellipsoid. He briefly gave background information on what a datum is—basically a set of constants for specifying the coordinate system used for calculating points on the earth—a common reference system. Specific geodetic datums are usually given distinct names like NAD83—for vertical datum e.g. NGVD 29. The earth is not really two dimensional though—contemporary datums are not separated into three dimensional ones: Latitude, Longitude and Ellipsoid height. So when NOAA moves to the ellipsoid we are talking about a 3-D representation instead of the 2-D we are used to. An ellipsoid is almost like a sphere, but it has a major axis and a minor axis, so it's not completely round or completely spherical. We need an ellipsoid because it becomes important when we start talking in three dimensions when we want to reference our position on earth. The ellipsoid is sort of the mathematical representation to what the earth's surface really looks like.

Mr. Parsons is the NOAA IOCM Coordinator, and the Co-chair of the Interim Sea Working Group on Ocean and Coastal Mapping. He briefly spoke about how the NRC produced a report in 2004 entitled "Geospatial Framework for the Coastal Zone: National Needs for Coastal Mapping and Charting." Some of the things the NRC assessment pointed out is that they took a lot of pain to address common user needs for ocean and coastal geospatial data, ocean and coastal mapping data, and ocean and coastal mapping product development. Also, he brought up other issues mentioned in the morning meetings: compatibility among data formats, standardization, and the need for inter- and intra-agency coordination, communication, and cooperation. Making data accessible—NOAA has any number of portals by which you may or may not discover data, and that is a problem that both the NRC and the Ocean Action Plan addressed.

Action Item:
Common shared needs: There are needs of leverage and set priorities and develop Standards, develop and share and standardize the mechanisms for acquiring data, distributing data etc.

Meeting Introduction – Tuesday, July 29, 2008:

Cosco Busan Oil Spill Response:

- Jordan Stout, NOAA Office of Response and Restoration
- LT. Commander Gus Bannan, USCG Sector San Francisco
- Dave Reynolds, NOAA National Weather Service

LT. Commander Gus Bannan, Chief of Incident Management in San Francisco formally "Marine Environmental Response provided an update of the Cosco Busan response and mentioned that to date, there had been an over 40 percent clean-up of the oil which surpassed the typical 10 to 15 percent which is considered a good clean up. Within the first two days, over 30 percent was cleaned up. The amount contaminated land and oiled shoreline was about 371 total miles throughout the Bay Area and Angel Island was one of

the remaining segments that remained to be cleaned up. The Coast Guard has two standing segments that they believe have buried oil which poses the problem of not knowing how far down its been buried.

A copy of the official ISPR report that highlights the statistics was put together by a variety of agencies. The USCG commandant requested an ISPR, which is an incident-specific group, to prepare a full review of all the procedures, and it covers the details about the response and less about the actual accident. The accident is still under review by several different agencies. Concerning birds and mammals, 1,084 were captured alive; 1,851 were collected dead; 432 have been rehabilitated.

For the Cosco Busan incident, NOAA provided a number of roles such as: scientific support, resource expertise, and sanctuary management. They were heavily involved in Natural Resource Damage Assessment which is ongoing and will continue for the next couple years. NOAA also had a representative on the Regional Response Team and on the panel that provided input on the ISPR report to get sort of an outside, independent peer review of the process.

At the time of the incident, the current meter at the Bay Bridge was not putting out data, so response teams weren't able to use the PORTS station or the tide station at the Golden Gate, which have helped them to validate their tidal models and pick out a written trajectory estimate of where the oil was going to go.

After a discussion with the USCG modeling folks of their wish list of items they could have used that came out of Cosco Busan response, PORTS® was viewed as an important thing for them to use in the San Francisco Bay Area. An operational current meter at the Bay Bridge could have been helpful, but the USCG was able to use other information to help map and frame out the problem.

The PORTS® system was not operational at the time of the Cosco Busan accident and was having to rely on a tide station out at Golden Gate. Mr. Szabados mentioned that PORTS® was not working at the time of the incident due to a shortage in funding and that over the last several years, the maintenance has fallen off on some of its sensors. NOAA has partnered with an organization called "OSPR" or the Office of Spill Prevention and Response with the Marine Exchange in terms of Operation and Maintenance (O&M) funding and that has fluctuated over the past several years.

NOAA does a number of the ports based on available resources and is looking at developing or building relationships with operational modeling entities. The integration of visibility to PORTS® is something that NOAA has been working on for several years and been testing several instruments in the past, and unsuccessfully working with the USCG and Federal Aviation Administration (FAA), with finding a reliable visibility sensor.

Captain Hickman noted that it is important to capture the fact that the PORTS® system was down and that taxpayers dollars were used to put the equipment in. While it may

have/not have changed the events of the Cosco Busan, the fact remains that it could have been used to collect real-time data and the fact that equipment was there and was not being maintained due to local money not made available.
A comment was also made that it would be nice if the PORTS® system had wind and visibility sensors. Mr. Szabados mentioned that all those wind sensors that are presently out there are incorporated into PORTS® and announced that NOAA was in the process of installing three new ones to add to the existing network.

LT. Commander Bannan mentioned that the total response cost is around $75 million for the Cosco Busan incident which is viewed as a minor to medium oil spill. As of right now, the financial responsibility that includes the USCG costs and other governmental agency costs including both Fish & Game, OSPR, as well as some of the NOAA costs is somewhere around $3.5 to $4 million. From a ship like that, if they had actually struck it head on, we would be dealing with a major spill at least as large as the one experienced down in Louisiana.

Mr. Reynolds mentioned that the cost of inputting a full Automated Surface Observing System (ASOS) is estimated to be about $10K and Mr. Welch noted that not while the lack of one of these systems in any way contributed to this accident, you certainly could conceive of a situation where the presence of one of these systems would avoided an accident many times more expensive than something like this.

Mr. Welch noted that we have a national policy of investing pennies into these preventative measures, and then instead of doing that -- by saving that money, we spend hundreds of millions of dollars in response measures after the accidents occur.

During the discussion, there was a comment about what PORTS® and how PORTS® was used in the Cosco Busan response and how the lack of the current data might have—had the PORTS® system been operational would have helped in refining the response and provided some suggestions about what PORTS® could do in a future response.

A one-pager is needed from Jordan Stout of NOAA-OR&R for the Panel members that describes the role of PORTS® in this particular response and what could be done in PORTS® to help future responses in the Bay Area? If there were a one-page with bullets saying, "Here's how it was used"; "Here's how it could have been better in this particular aspect"; "Here's how NOAA in this day could use it in the future," that would be very helpful to the Panel.

There's a specific problem in the San Francisco Bay Area and the Panel needs to make sure that the policymakers of the San Francisco Bay have some very concrete observations about the SF PORTS® system, whether it's the state arguing maintenance costs or the Federal folks or whether there ought to be a federal responsibility for maintenance costs.

National Geodetic Survey (NGS) 5 Year Strategic Plan and GRAV-D Plan:
Mr. Dave Zilkoski, presented NGS' 5 Year Strategic Plan and the GRAV-D Plan. He spoke of the mission of the NGS and that it has not really changed in 200 years. NGS provides the infrastructure for the National Spatial Reference System (NSRS). Infrastructure, models and tools, and outside capacity, are the three capabilities that NGS brings. Its next steps are highlighted in its 5-year strategic plan and it's 10-year plan which serves as its future vision. Mr. Zilkoski, pointed out that NGS' strategy is to have the ability to create better infrastructure, models and tools so that its partners don't need its many monuments any longer. The NGS plan is to evolve its infrastructure and expand its models and tools so that its better positioned to use that infrastructure that its reducing like CORS and gravity models that are needed to complete the process and then provide outside capacity where the user -meets their needs.

NGS is presently building its outside capacity, transferring its technology, and decreasing its infrastructure Spatial Reference Center and Height Modernization programs. It will be dealing with more of a customer focus with its infrastructure explaining what it can bring to the table and finding out what its customers bring to develop an integrated cooperative organization.

Mr. Zilkoski, also talked about how NGS believes that customers are in need of better horizontal and vertical data. In 5-10 years, NGS will have new horizontal and vertical data as part of its plan. The use of satellite information to get accurate elevations is what most people need in terms of inundation models and erosion. Over the past year, NGS has been meeting with people that are building inundation models with the Hurricane Center and has been meeting with coastal zone managers and talking about evacuation routes in hopes of building a better system of models and tools that meet their needs.

One of its major pushes in the next 10 years is a program called "GRAV-D" or Gravity for the Redefinition which will replace the American Vertical Datum or "NAVD," North American Vertical Datum of 1988. In 10 years, GRAV-D will replace that data.

NGS presently has millions of navigation reports in its database which spans from the early '30s all the way until today. All of the things that elevations are important for GRAV-D supports. The idea is that you'll get elevations with GPS to within two centimeters in a very few minutes of data. At a cost of $38 million over 10 years, it's not all that expensive. The whole GRAV-D report has been included in the HSRP booklets and at present work is going on in Alaska because Alaska is one of the biggest benefactors of this program. NGS invites the HSRP to look at it plan and send its comments to Dru Smith by Oct.1st.

Climate and the Coasts, Arctic Policy Update & Requirements for NOAA Navigation Services:

Ms. Amy Holman, NOAA's Alaska Regional Collaboration Team (ARCT) talked about the implications and challenges of climate change for the state of Alaska and NOAA's navigation role in this situation. NOAA's ARCT is a regional concept team established by Vice Admiral Lautenbacher in late 2006. Purpose is to coordinate with regional stakeholders to integrate NOAA's products and services to meet the hydrographic and navigation needs of Alaska. Also, to get Federal agencies to speak with a more unified message particularly on the side of climate change, and how they are working together. For the past two years, the ARCT has developed an "Integrated Services Plan (ISP)" where NOAA went out into the community and asked: What are the things that NOAA needs to be planning for in the next 10-20 year time frame? The ISP shows 21 different scenarios that it believes NOAA should be addressing and involved with its stakeholders.

The Alaska State Legislature and Administration has come up with recommendations primarily on dealing with climate change. One of the biggest things in the news last year was the Arctic's ice melt which could possibly lead to the potential for sea routes opening. Climbing temperatures are leading to Permafrost thaw and Alaska is home to one of the national strategic ports in Anchorage.

Action Item:

The Immediate Actions Working Group set up by the Governor of Alaska to look at coastal communities has asked NOAA for sea ice measurements, weather observations, water level and tides, geodetic and vertical control, and ice forecasting. In terms of mapping, drafts were identified in the Arctic Marine Shipping Assessment which will be released later this year as a recommendation and a bilateral mapping of the Bering Strait.

The Joint Climate Impact Assessment Report (State Legislator's report) identified: geodesy, water levels, precipitation, weather, unmanned aerial, technology development, and fisheries as emerging requirements for improved mapping and hydrographic data in the Arctic area.

Ms. Holman spoke about the need for NOAA to help Alaska coastal communities stop coastal erosion. Recent General Accountability Office (GAO) and USACE reports have identified over 180 Alaskan communities experiencing some kind of coastal erosion in which the vertical control is needed. There are seven communities in imminent danger of being wiped away in one good fall storm, and there is a need for the DEM to tell us what the inundation is going to be. She also spoke about how the NOAA Corps is going to place an officer aboard one of the USCG vessels that is doing water waves analysis this summer up on the North Slope. Its tasks are to: 1) work on the coast pilot; 2) conduct weather, ice and other observations; 3) assist the Coast Guard with their reports; and 4) look at hydrographic survey best practices. There are also other ongoing research efforts to increase NOAA's ability to model waves accurately in Alaska.

Ms. Holman pointed out that Alaska has been experiencing a number of intensifying fires as a result of the climate change impacts. As temperatures are warming, the vegetation is growing, leading to more fuel, which thunderstorms trigger, and NOAA is also seeing an increase in ocean acidification which has an obvious effect to Alaska's living marine resources. NOAA, partnering with the USCG in an effort to obtain more observations, is presently training USCG personnel to do ice-edge observations. Loss of data from the Radar Sat-1 has caused NOAA to minimize the number of synthetic aperture radar images. This directly impacts NOAA's ability to forecast ice-edge and other ice observations. NOAA has placed scientists on a USCG vessel to conduct water and wave analysis, weather and ice observations, and hydrographic observations.

Ms. Chappell mentioned that at one time, we were getting Radar Sat-1 data for free from the NOAA's National Ice Center (NIC) through partnerships with the Navy and the National Geospatial-Imagery Association (NGIA) along with the Defense Mapping Agency (DMA). NOAA now has to procure the data, but it's actually cheaper to buy SAR imagery from the European and Japanese providers. NOAA is also looking at future potential partnerships with Canada, on sort of a replacement for Radar Sat, a government-owned operation that would be shared with NASA, NOAA, Canada, for free data in the future for a new satellite system.

NOAA National Weather Service (NWS) and the Minerals Management Service (MMS) just recently established a partnership on their ice observations and is gaining more data on their history of working with the oil and gas companies to see if there are other opportunities in which it could potentially explore.

Ms. Holman also talked about how the military is stepping up its patrol of the Arctic. There is increasing numbers of unannounced flights going on. Currently, there is no Antarctic Treaty to explain how this is all going to work. Further, there is increasing numbers of visitors/tourists who travel by ship wanting to see the Arctic now that it's more accessible, although there is no infrastructure currently in place to support them. In response, the USCG has stepped up its presence with having different deployments of aircraft, both fixed wing and rotor, and two vessels.

Ms. Holman talked about how NOAA IOCM project is working in Hedgemont Bay with a homeowner in the Alaska area, where they are helping them get more habitat information out of the data we're using. The Fishery Management Plans are so data sparse on habitats, so between the National Fishery Service and the state, there is really a dearth of information, and the habitat is crucial. NOAA is also trying to do more with the USGS. There is currently a statewide digital mapping initiative going on, and they have written a letter of support for the GRAV-D project, and NOAA is trying to coordinate mapping flights. USGS is doing some work on the North Slope and it would be idea to partner with them due to the great need of unknowns and put IOCM in effect up in that region.

Recommendation:
Mr. Welch noted that NOAA should be very careful where it invests its activities up there. The potential resources that are going to that region for hydrographic services are not going to be add-on resources; and will be possibly be diverted from other hydrographic services in all the other states. Mr. Welch strongly recommends that NOAA not be spending a bunch of money on hydrographic services to help promote possible deep-sea shipping from Europe to Asia when NOAA is not doing enough to promote shipping to the Port of Long Beach or Houston, and feels that NOAA has some tough choices to make in response to this issue. He feels that NOAA could easily see hydrographic services based on oil development and oil exploration up there, because that really relates to direct impacts nationally. NOAA should not just jump on the bandwagon of Arctic research to see if they can get some "blessing" for this type of stuff."

Recommendation:
Mr. Whiting believes that we don't need to do anything up in that region today, but feels that we have to start planning in terms of emergency response. Ms. Holman noted that the Canadians are planning and presently doing ice trajectory, making plans for a deepwater port, and for additional icebreakers.

Mr. Dunnigan mentioned that there's a new collaborative agreement between the Canadian Meteorological Service (CMS) and NOAA, signed in January 2008, to share marine and ice forecasting data and work together on climate issues. Another important issue Mr. Dunnigan raised is that we need to consider increased commercial traffic in the Arctic. Assuming an ice-free transportation line isn't necessarily going to directly come to the U.S. if it's just making it easier to get from Asia to Europe, but rather is going to be going through U.S. waters which are very environmentally sensitive. If something goes wrong, we are the ones that will be held responsible, therefore it gives us another reason to make sure that we have the information that we need to promote safety.

Panel Discussions on Potential Recommendations (to be finalized at a teleconference arranged following July 2008 meeting):
The HSRP feels that NOAA should be aggressive in going after funding for hydrographic services in FY09. Mr. Dunnigan noted that he supports the President's FY 2009 request and said that he didn't know whether the HSRP necessarily needed to. The House and Senate subcommittee marks are dramatically different from each other. If funding for FY09 ended up in a continuing resolution—at FY08 levels—the HSRP is concerned that NOAA's Hydrographic services would be underfunded and feels that it might be an opportunity for an emergency supplemental.

In terms of PORTS®, it's not necessary for us to refer to either the Oil Spill Fund or Harbor Maintenance Trust Fund (HMTF). People have different levels of familiarity with intricacies of those, but the HSRP has concluded that the cost benefit of the PORTS® program is dramatic; therefore, NOAA needs to figure out some way to aggressively fund the program.

Mr. Dunnigan noted that issues relating to the Oil Spill Liability Trust Fund and the Harbor Maintenance Trust Fund are actively being discussed. Both are separate funds within the U.S. Treasury that are managed. The HMTF is running right now at about a $4 billion surplus. Funds need to be appropriated from the trust funds for Oil Spill Liability, some funds can come out automatically, but other funds need to be appropriated. Though both are Federal funds, they are segregated and operate a little bit differently, so if the HMTF doesn't get appropriated, it just builds up. The CMTS has been actively addressing these issues.

Mr. McBride stated that the HMTF is subject to a lot of controversy right now amongst ports, and particularly channel users, because it's specific intention. When HMTF was drafted in 1986, it was to provide funding for dredging, a nominally $4 million service. But that cash drawer is empty because it now has to pay for war activities, and everything else, so there's no actual money there. There is a great deal of discussion amongst industry and port users about trying to tap into the HMTF, although it was fully appropriated to the USACE for dredging.

Mr. Welch noted that in reference to the Harbor Maintenance Tax, there are folks who feel like they have been taxed for a long time for a specific purpose─dredging. Monies have been building up and through various policies and Administrations (both Democratic and Republican), these folks feel that the monies has not bee spent on dredging. These folks have rightly been saying "why they are we paying these taxes?" Referencing the HMTF, you are taking money, that other folks perceive was collected from, them under less-than-truthful pretenses, whereas the Oil Spill Fund, there is less of a proprietary interest in the people who take it.

Mr. McBride feels that HSRP focus the NOAA Administrator on available trust funds and don't specify the HMTF.

Mr. Skinner recommended that we reiterate our support for a long-term solution for full Federal funding for PORTS®, but in the interim suggested that NOAA work with Department of Justice (DOJ) to not only support PORTS® funding, but other hydrographic uses, for any settlement process of the Coso Busan incident, and expand it. Mr. Skinner also feels that the HSRP should continue to push NOAA for a steady funding source and an increased funding source and explore the possibility of a DOJ settlement amount that could be used for something in San Francisco Bay for navigation.

Mr. Jacobsen suggested that the Marine Exchange may be a possibility of helping to secure PORTS® funding.

RADM West believes that the HSRP should help NOAA better coordinate and integrate what it spends in hydrographic services and identify what it spends in coastal areas to better manage public money. He feels that NOAA needs a better story about how it integrates its capabilities into NOAA investments and then into interagency investments of public money.

Print on Demand:
Mr. Welch spoke on the print-on-demand (POD) and raster chart vulnerability issue and questioned where it should be apart of the NOAA capability/ability to do these charts and should NOAA be required to do this capability in-house?

In regards to paper chart, CAPT. Steve Barnum noted that NOAA currently has lithographic charts as a fall-back or a backup system to the POD charts, and as NOAA moves forward, it is looking at its options. NOAA currently contracts with the FAA for the litho charts.

Mr. Dassler believes that the real issue is that raster charts are not currently being updated with the local Notice to Mariners that are coming out and are dangerous to navigation and that getting back online as soon as possible is the real issue.

Recommendation:
Mr. Dassler recommendation that NOAA do what's needed to get the Raster charts back, with giving regular updates as soon as possible, and then have a plan that offers some kind of redundancy/reliability if something happens again without needing a specific recommendation on how to do it.

CAPT Steve Barnum noted that Raster charts are not approved for navigation, yet ENCs and paper charts are under Title 33. CAPT Barnum admitted that the POD issue did reveal a weakness in the system. ADMIRAL WEST wasn't sure whether this is the type of topic that needs to go to the NOAA administrator and that CAPT Barnum and the Director of NOS report back to the HSRP in 60-90 days with a solution.

Action Item:
Mr. Dunnigan agreed. He and CAPT Barnum will report back at the next HSRP meeting.

Geodesy:
The HSRP understands the need for accurate heights and we could build on it even more by saying the marine transportation industry could benefit as ships become their own tide gauges to maximize efficiency and time during their approach and departure from harbors. Coastal environment concerns, such as sea level rise, subsidence, storm surge, and accurate definition of state seaward boundaries could be addressed and sensitive decisions made based on accurate data. The idea was is for the HSRP to endorse a National Research Council study on a height modernization program.

The Mapping Science Committee has recommended a study to assess the benefits of the Height Modernization Program. Using the 10-year plan as a starting point and providing guidance on how NGS can most effectively execute this on a national basis and the benefit for society. The study would address specifically societal benefits; technical improvements that NGS can provide the nation; identify other federal programs that would benefit from the improved three-dimensional geodetic control that National Height Modernization Program can provide; review parts of the 10-year plan that are relevant to

the implementation of accurate vertical control; identify key organizational attributes and infrastructure required to support National Height Modernization; and then identify opportunities for improvements to the National Geodetic Survey's organization and infrastructure to support a National Height Modernization Program and existing regional and state modernization programs.

Action Item:
The task for the HSRP is to endorse the Mapping Science Committee study and publish a report on the societal benefits of the National Height Modernization Program.

The HSRP feels that this is a worthwhile investment; however, it is reluctant to move forward with this at this point. Perhaps at the next meeting, the HSRP can be given more detail and will at that time be able to give a recommendation.

Action Item:
Mr. Welch suggested that at a future meeting we invite MMS and a panel of the leaseholders to give a presentation as to what their plans are up in the Arctic and find out their hydrographic needs? Admiral West suggested that along the Arctic theme, NOAA conduct a briefing on its intentions and extend invitations to Department of Defense (DOD), USCG, and the NIC.

Mrs. Chappell noted that, if the HSRP is looking at mapping requirements from the oil and leaseholders they might also want to hear from other parts of NOAA about their ecosystem, fisheries, mapping needs if a panel is going to be put together.

Mr. Whiting questioned Ms. Holman to see whether any Alaskan natives would be interested in coming to the next HSRP meeting and expressing their opposition or support of this effort. In addition, Ms. Holman indicated that the joint Alaska Command (ALCOM) and USCG would most certainly be interested and that ALCOM could give the military-wide perspective.

Mr. Whiting then questioned about whether the native corporations like NANA (Native – owned Regional Corporation)─descendants of first native people to live in Northwest Alaska or Arctic Slope Regional Corporation (Native-owned Corporation) should be invited to attend an HSRP meeting. Ms. Holman indicated that she would be happy to help arrange the invitation process.

Recommendation:
Mr. Armstrong felt that maybe members of the HSRP were getting a little overaggressive for the next meeting and suggested that since we have time to deal with the Arctic that the HSRP hold off till the meeting after next to include these items on the agenda.

Public Comment Period:
Ms. Kerkering encouraged the HSRP to promote NOAA IOOS and maybe have a discussion of it at the next scheduled meeting. She believes that San Francisco may be a good place for a pilot project due to NOAA's relationships between the state agencies, all

the NOAA PORTS®, NOAA NERRS (National Estuarine Research Reserve System), the sanctuaries, OSPR (Office of Spill, Prevention and Response), and its relationship with CDIP (Coastal Data Information Program). She mentioned that IOOS does work with a lot of other groups, monitoring within the Bay with groups such as U.S. Geologic Survey (USGS), and all of the environmental health departments of each of the nine surrounding counties.

Recommendation:
Ms. Kerkering also encouraged the HSRP for the inclusion of HF radar in its recommendations for technology to improve marine transportation and event response. She mentioned that it has been used throughout the state to track coastal discharges which have been proven useful for determining when to close beaches and keep them open, and playing a role in plant, wildlife, and human health issues. It has also proved successful in both the Safe Seas oil spill scenario and in the Cosco Busan event response and its essential to have that information. At present, it's funded through the state, through a voter-approved bond, but that funding runs out mid to late next year, and then there is no more funding for HF radar beyond that. She and others have been trying to get NOAA on board with this.

There is a meeting in August, in Colorado, to develop a national HF radar plan, and all the regional associations have reps going there. It would be very much appreciated if the HSRP could make recommendations to help fund the HF radar for marine transportation and event response for the San Francisco Bay and anywhere else in the nation.

Public Meeting Adjourned

To view any slide presentations, please visit:
http://nauticalcharts.noaa.gov/ocs/hsrp/archive/library.htm.

The public meeting was adjourned at 1:34pm. To view or download the verbatim meeting transcript, please visit:
http://nauticalcharts.noaa.gov/ocs/hsrp/archive/minutes/mar21_07tran.txt or
http://nauticalcharts.noaa.gov/ocs/hsrp/archive/minutes/mar22_07tran.txt.

Appendix I
Attendees at San Francisco HSRP Mtg.

Voting HSRP Members

Jonathan L. Dassler	Director of Hydrographic Services, David Evans and Associates, Inc.
Elaine L. Dickinson (teleconference)	Boat Owners Association of the United States (BoatU.S.)
Captain Sherri L. Hickman	Houston Pilots Association
Captain Thomas Jacobsen	LA Long Beach Pilots Association
Gary A. Jeffress	Geographic Information Science, Texas A&M University
R. Adam McBride	Lake Charles & Terminal District
Tom Skinner, HSRP Chair	Senior Project Manager, Durand & Anastas Environmental Strategies, Inc.
Edmund Welch, HSRP Co-chair	Independent Consultant
Matthew Wellslager	South Carolina Geodetic Survey
Rear Admiral Richard West, USN (Ret.) (via conference call)	President and CEO, Consortium for Oceanographic Research and Education (CORE)
Larry Whiting	Hydrographer, Terra Surveys LLC

Non-voting Members

Captain Andrew Armstrong, NOAA (Ret.)	Co-Director, NOAA/UNH Joint Hydrographic Center
Dave Zilkoski	Director, National Geodetic Survey
Michael Szabados	Director, Center for Operational Oceanographic Products and Services

Designated Federal Officer

Captain Steven R. Barnum, NOAA	Director, Office of Coast Survey

HSRP Decision Maker

John H. Dunnigan	Assistant Administrator, National Ocean Service

Presenter/Speaker

Jim Haussener	California Marine Affairs and Navigation Conference
Jim Fawcett	Sea Grant Ports and Harbors
Captain Lynn Korwatch	San Francisco Marine Exchange
Captain Marc Bayer	Tesoro West Coast Shipping Operations
Eric Van Dyke	Elkhorn Slough National Estuarine Research Reserve
Shelia Seamans	California Seafloor Mapping Program, California State Coastal Conservancy
Julie Thomas	Scripps Institution of Oceanography
David DeGree	President, OceanGrafix
Larry Koon (teleconference)	OceanGrafix
Mike Serafin	Baker Lyman, Inc.
Marilee Schaffer	Waypoints, Inc.
Jordan Stout	NOAA Office of Response & Restoration
Dave Reynolds	NOAA National Weather Service
Dave Enabit	NOAA Office of Coast Survey
Amy Holman	NOAA National Ocean Service
Roger Parsons	NOAA Office of Coast Survey
LCDR. Edward Van Den Ameele	NOAA Office of Coast Survey
Dave Zilkoski	NOAA National Geodetic Survey

Staff

Kathy Watson	HSRP Team Lead, NOAA Office of Coast Survey
Ashley Chappell	NOAA Office of Coast Survey
Virginia Dentler	NOAA Center for Operational Oceanographic Products and Services
Danielle Stuby	NOAA National Geodetic Survey

Others/Public

Terence Lynch	NOAA Office of Coast Survey
Bruce Vogt	NOAA National Ocean Service
Michael Serafin	
Michael Szabados	NOAA Director, Center for Operational Oceanographic Products & Services
Julianna Thomas	
Dave Zilkoski	NOAA Director, National Geodetic Survey