

National Marine Sanctuary Program Research Coordinators Meeting 2006



Hosted by the
Hawaiian Islands Humpback Whale and the Northwestern Hawaiian Islands
National Marine Sanctuaries

Held at the Waimea Plantation in Kauai, Hawaii

February 14 - 18, 2006

Report of the National Marine Sanctuary Program, Research Coordinators Meeting 2006

Contact: Dr. Steve Gittings, Science Program Manager, NMSP

Credits:

Cover Photos:

Top left: Aggregation of Rudderfish and Black Triggerfish, Credit: Na Pali Explorer (<http://www.napali-explorer.com/>)

Top right : Humpback whale breaching, Na Pali Coast in background, Credit: Na Pali Explorer

Center: Kauai rooster, Credit: Metroblogging Hawaii (<http://hawaii.metblogs.com/>)

Bottom left: Underwater caves along Na Pali Coast, Credit: Na Pali Explorer

Bottom right: Waimea Plantation Beach, Credit: Kathy Dalton

Report Preparation: Kathy Dalton



U.S. Department of Commerce
Carlos M. Gutierrez, Secretary

National Oceanic and Atmospheric Administration
VADM Conrad C. Lautenbacher, Jr. (USN-ret.)
Under Secretary of Commerce for Oceans and Atmosphere

National Ocean Service
John H. Dunnigan, Assistant Administrator

Silver Spring, Maryland
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Office of National Marine Sanctuaries
Daniel J. Basta, Director

AGENDA

Day One: Tuesday, February 14

- 2:30 pm Science Council Meeting
 - Drivers, purposes, and strategic links
 - Council membership and operations
 - Roles, responsibilities
 - Communications (science accomplishments and needs)
 - Council activities and schedule
 - Congressional contacts (RCs, staff)
 - Charter and protocols

Day Two: Wednesday, February 15

- 8:30 am Welcome to Kauai and the Waimea Plantation – *Randy Kosaki and Jean Souza*
- 8:45 am Introduction and overview for the meeting – *Steve Gittings*
- 9:00 am Pacific Regional Science – *Dr. Joanne Leong, HIMB Director*
- 10:00 am Site activities and collaboration among sites – *10 minute presentations by Research Coordinators*
- 12:00 pm Lunch
- 1:00 pm NCCOS Partnership
 - Project updates – *Mark Fonseca*
 - Director's meeting and future activities – *Patricia Hay*
- 3:00 pm REEF update – *Gittings*
- 3:15 pm HMAP update – *Catherine Marzin*
- 3:45 pm Website development and the Conservation Series – *Kathy Dalton*
- 4:15 pm AUV presentation – *Brendan Foley, WHOI/DSL*
- 5:00 pm Adjourn

Day Three: Thursday, February 16

- 8:30 am SWiM reports – *Dalton, Jeff Rosen, Gittings*
- 11:00 am Science Needs: EAM Issues and end-to-end science accomplishments and needs – *Gittings*
 - Introduction
 - Lunch time work-session
 - Report outs
- 2:00 pm Regional structure and Science Council discussion – *Gittings*
- 3:00 pm Program Diving Issues – *Mitchell Tartt*
- 3:30 pm Site Characterization – *Tartt*
- 4:00 pm Program Performance Measures – *Tartt*
- 4:30 pm FY07 Priorities – *Tartt and Gittings*
- 5:00 pm Adjourn

Day Four: Friday, February 17

- 8:30 am IMaST – *Christine Taylor and Jaeson Abraham*
- 10:00 am Data collection and consistency on NMSP funded cruises - *Taylor*
- 10:30 am Seabed Mapping Prioritization Project – *Taylor*
- 11:15 am NMSP Atlas Project – *Taylor*
- 12:00 pm Lunch – FY06 AOP Summary & FY07 AOP guidance/priorities - *Gittings*
- 2:00 pm Regional Breakouts
- 3:00 pm Adjourn

Day Five: Saturday, February 18

- UAV trials (Upolu Point, Island of Hawaii)

National Marine Sanctuary Program
Research Coordinators Meeting
Tuesday, February 14 – Saturday, February 18, 2006

INTRODUCTION

Despite difficult budget cuts in FY2006, the NMSP has high expectations for continued progress on conservation science. We continue to form strong partnerships, both locally and nationally, conduct numerous field activities, are generating funds for sanctuary science, and are participating in a number of outreach activities to promote our programs. A week after the Research Coordinators meeting, we would have the opportunity to brief Congress on science accomplishments, distribute documents highlighting our programs, and provide information on NMSP, NOAA, and partner expenditures on research and monitoring.

The NMSP continues to evolve, with greater attention to building regional activities and infrastructure, conducting regional expeditions, and promoting and participating in regional observing system activities. We are working to evaluate new technologies for research, monitoring, education, management, and enforcement. And we continue to work toward system-wide approaches to planning, conducting, and reporting on our program's work.

All this activity, combined with the continued commitment to site-based research coordination and field activities, requires improvements in teamwork among NMSP science staff. It will require commitments of some staff to new and expanded roles as they serve on the newly formed Science Council. Lines of communication will have to be built to ensure effectiveness of the new regional structure of the NMSP. With new requirements for meeting performance measures under restricted budgets, we need to reevaluate our science needs and promote our science priorities to existing and prospective partners inside and outside NOAA. And we must continue to create trails to the future of marine conservation through commitments to developing and evaluating new management approaches and incorporating new technologies that promote efficiency.

With these thoughts in mind, four goals were set for the FY2006 Research Coordinators meeting:

- Teamwork – enhance our ability to work efficiently in the new regional structure of the NMSP
- Growth – commit to new roles that improve top-to-bottom and side-to-side integration
- Outreach and “Insight” – recognize, announce and take advantage of our accomplishments and the contributions of our partners, and commit to reevaluating our priority science needs
- Looking to the Future- explore the potential for new technological approaches to support science and management

Sessions and action items focused on these goals. The first meeting of the Science Council addressed a number of new regional responsibilities of Council members, with the goal being to improve communications and cooperation among sanctuaries within each region of the sanctuary system. We committed to generating a series of one-pagers that outline the role science has played in marine sanctuary management. These will be compiled into an outreach document targeted at Congress, NOAA leadership, and science partners. Following that, we committed to using a similar approach to update the science needs of the program, in this case targeting partners, potential new partners, and funding decision makers. Meeting sessions on System-Wide Monitoring (SWiM), historical ecology (HMAP), the Reef Environmental Foundation (REEF), website development, performance measures, and IMaST all focused on programs that support the sanctuary system and promote national recognition of our efforts and needs, even as most are implemented at the local scale and directly support individual sanctuary needs.

Below is the list of meeting participants, as well as extended descriptions of the sessions. This report is also available as a pdf document on the NMSP website: <http://sanctuaries.noaa.gov>.

ATTENDEES AND CONTACT INFORMATION

	Name	Affiliation/Location	Email
1	Jaeson Abraham	NMSP/HQ	Jaeson.Abraham@noaa.gov
2	Brad Barr	NMSP/Woods Hole	Brad.Barr@noaa.gov
3	Ed Bowlby	Olympic Coast NMS	Ed.Bowlby@noaa.gov
4	John Broadwater	NMSP/Maritime Heritage Program	John.Broadwater@noaa.gov
5	Kathy Dalton	NMSP/HQ	Kathy.Dalton@noaa.gov
6	Andrew DeVogelaere	Monterey Bay NMS	Andrew.Devogelaere@noaa.gov
7	Sarah Fangman	Channel Islands NMS	Sarah.Fangman@noaa.gov
8	Brendan Foley	Woods Hole	bfoley@whoi.edu
9	Mark Fonseca	NCCOS	Mark.Fonseca@noaa.gov
10	Steve Gittings	NMSP/HQ	Steve.Gittings@noaa.gov
11	Ben Haskell	Stellwagen Bank NMS	Ben.Haskell@noaa.gov
12	Patricia Hay	NCCOS	Patricia.Hay@noaa.gov
13	Emma Hickerson	Flower Garden Banks NMS	Emma.Hickerson@noaa.gov
14	Brian Keller	Florida Keys NMS	Brian.Keller@noaa.gov
15	Bill Kiene	Fagatele Bay NMS	William.Kiene@noaa.gov
16	Randy Kosaki	Northwestern Hawaiian Islands NMS	Randall.Kosaki@noaa.gov
17	Joanne Leong	Hawaii Institute of Marine Biology	joanneo@hawaii.edu
18	Dani Lipski	Channel Islands NMS	Danielle.Lipski@noaa.gov
19	Catherine Marzin	NMSP/HQ	Chatherine.Marzin@noaa.gov
20	David Matilla	Humpback Whale NMS	David.Matilla@noaa.gov
21	Greg McFall	Gray's Reef NMS	Greg.Mcfall@noaa.gov
22	Paul Orlando	NMSP/HQ	Paul.Orlando@noaa.gov
23	Bob Pavia	NMSP/Seattle	Robert.Pavia@noaa.gov
24	Jan Roletto	Gulf of the Farallones NMS	Jan.Roletto@noaa.gov
25	Jeff Rosen	Clancy Environmental Consultants, Inc.	jrosen@clancyenv.com
26	Jean Souza	Humpback Whale NMS	Jean.Souza@noaa.gov
27	Mitchell Tartt	NMSP/HQ	Mitchell.Tartt@noaa.gov
28	Chris Taylor	NMSP/HQ	Christine.Taylor@noaa.gov
29	Allen Tom	NMSP/Pacific Region	Allen.Tom@noaa.gov
30	Monika Thiele	NMSP/HQ	Monika.Thiele@noaa.gov

PRESENTATION SUMMARIES

Day One: Tuesday, February 14

SCIENCE COUNCIL MEETING

Presenter: Steve Gittings

Attendees: Steve Gittings, Ed Bowlby, Kathy Dalton, Brian Keller, Randy Kosaki, Jean Souza, and Mitchell Tartt

Summary: Gittings used this session to introduce the goals, purpose, responsibilities, organization and operations of the Science Council to its inaugural members. The Science Council will be a body composed of research staff that will promote system-wide and regional coordination on conservation science. The Council will provide a mechanism for the National Marine Sanctuaries to improve communication and obtain valuable feedback and input at the site, regional, and system levels and will increase our flexibility and capabilities in cross-cutting program areas. In particular, the structure will permit the sanctuary program to ascend beyond a collection of individual site programs into a deliberate, coordinated, national program that is larger than the sum of its parts. The purposes of the Science Council include: provide advice and recommendations to the ONMS Executive Team, Leadership Team, and ONMS on conservation science needs and priorities; enhance communication at site, regional and national levels regarding science operations, opportunities, priorities, and strategies; and coordinate activities and opportunities among sites, within regions, and nationally.

An initial set of responsibilities for the Council includes dissemination of information to the ET, regional AOP preparation and AOP review, regional fleet allocation (users themselves determine fleet allocations), proposal reviews, regional collaboration (e.g., with NMFS, IOOS), reviews of the Conservation Series, synthesis reports, and requirements documents, SWiM program review, developing research prospectuses, and preparing for the RC meeting and science symposia.

The Science Council will be organized as follows (inaugural members appear in parentheses): Science Program Manager (Gittings), Science Team member (Tartt), West Coast Research Coordinator or staff (Bowlby), Pacific Islands RC or staff (Daschbach), East Coast/Gulf of Mexico/Great Lakes RC or staff (Keller). Ex officio members include the Education Council Chair (Michiko Martin), and the Maritime Heritage Council Chair (Broadwater). Each person will serve a 2 year term (except the Science Program Manager). Operations will require that 10% of the person's staff time be committed to the Council; this will include travel to two meetings (RC meeting and 6 months afterwards) and conference calls on intervening quarters.

Action Items: Immediate action items include developing AOP Guidance and science priorities, the development of a Charter, and updating the program's accomplishments and science needs.

Day Two: Wednesday, February 15

WELCOME TO KAUAI INTRODUCTION AND OVERVIEW FOR MEETING

Presenters: Randy Kosaki, Jean Souza, and Steve Gittings

Summary: Kosaki and Souza gave the Research Coordinator's a warm welcome to the 7th Annual Research Coordinator's Meeting. The meeting was held at the Waimea Plantation, an historic sugar plantation in an oceanfront resort setting located on the west shore of Kauai.

Gittings followed the welcome by outlining the goals for the meeting. These goals include improving our teamwork (we must cooperate more on matters of mutual interest), growth (we must commit to new roles that improve top-to-bottom and side-to-side integration), outreach and "insight" (we need to recognize, announce and take advantage of our accomplishments and the contributions of our partners, and commit to identifying our priority needs) and finally, we must look to the future (explore the potential for new technological approaches to support science and management).

PACIFIC REGIONAL SCIENCE

Presenter: Dr. Joanne Leong

Summary: Dr. Leong, the director of the Hawaii Institute for Marine Biology (HIMB) summarized the partnership that NWHICRER has with HIMB. The original goal of the partnership was for HIMB to provide scientific support for the NWHICRER designation process; this has now evolved into HIMB providing science based information for management needs. Dr. Leong explained that for a relatively small amount of funding HIMB is able to provide 40 investigators focusing their studies on the reserve. Dr. Leong also noted that the Hawaiian Archipelago is a natural laboratory that provides opportunity for baseline assessment research. To date, HIMB has focused their research efforts on coral health and disease in the NWHI (is disease prevalent and are there indications of future problems?), examining the community structure and need for protection of the French Frigate Shoals, determining and predicting the scale of apex predator migrations, and developing ecosystem management models in collaboration with the National Center for Ecological Analysis and Synthesis (this includes creating maps, conducting benthic surveys, developing a database of existing data, conducting data synthesis and obtaining additional field data).

Actions: Consider forming similar partnerships at your site and region. Allen Tom will send a copy of the NWHICRER-HIMB Memorandum of Agreement.

SITE ACTIVITIES

Presenters: Research Coordinators gave 10 minute presentations on activities in their sanctuaries

Summary: Research Coordinators were asked to give a 10 minute presentation answering the following questions:

- What was your single greatest accomplishment for 2005?
- What was your biggest surprise of 2005?
- Where will you feel the FY06 budget cut the most?
- Do you have any prospects that brighten your hopes for FY06?
- What keeps you motivated?

Channel Islands

Sarah Fangman

Channel Islands NMS's single greatest achievement for 2005 was conducting 140 Days at Sea aboard the *R/V Shearwater* to conduct research & monitoring activities (191 DAS total when you add education, emergency response, maritime heritage, etc.). This is a very notable achievement as this level of effort is similar to the capabilities of the NOAA vessels. Most of these efforts were conducted through partnerships with other agencies and institutions, where CINMS staff provided input on the study design based on management needs and field support. Of those 140 DAS, major efforts included: Plumes and Blooms project, marine reserves monitoring, benthic mapping, and seabird monitoring. Other 2005 accomplishments included Sanctuary Aerial Monitoring and Spatial Analysis Program, Collaborative Marine Research Program, West Coast Obs, and Pflieger Institute of Environmental Research's fish tagging and movement studies. The FY06 budget cut will have a significant impact on the site's ability to conduct research (there is \$0 discretionary funds for research). The biggest impact this will have is on deep water reserves monitoring efforts. The Delta cruise is currently the only deep water project undertaken in the deep portions of the reserves (excluding the ROV project, but that project focuses at depths above 100m). Also, West Coast Obs and mini-grant funds have provided major contributions to the CINMS monitoring program, without these efforts this year it is unclear what the impacts to the program will be. 2006 prospects include the hiring of a new CINMS Research Coordinator and the full funding of the *R/V Shearwater*, which will allow for the important research and monitoring projects that have been supported by the vessel to continue in 2006.

Fagetele Bay

Bill Kiene

Many issues that are of concern at Fagetele Bay NMS are potential cross cutting themes amongst similar ecosystems at other sites. 2006 projects include determining what affect land-based problems have on the coral reef ecosystem, especially as compared to fishing pressures; building interagency cooperation; drafting the FBNMS Condition Report; and working with the EPA to complete the watershed classification scheme. FBNMS is a very diverse, resilient and robust ecosystem and the local American Samoan community must be engaged. Therefore, long-term goals for FBNMS include developing new MPAs in America Samoa (the governor wants 20% of the area to become no-take zones); evaluating ecosystem condition and the impact of management; and inspiring stewardship of all the Territory's resources.

Florida Keys

Brian Keller

The staffing situation at Florida Keys NMS is continually evolving. Joanne Delaney is still serving as the part time Permit Coordinator, an Associate Science Coordinator will be hired in FY06, and Brian will transition to the Regional Science Coordinator position as a Southeast Regional Science Office is established in St. Petersburg. The biggest accomplishment at FKNMS in 2005 was the *Nancy Foster* Coral Condition Cruise (Tortugas to Carysfort) during which a major bleaching event was studied (the result of the most stressful thermal event yet measured in the Keys). Several FKNMS staff, most notably Lauri MacLaughlin, contributed to the success of the cruise in collaboration with Dr. Debbie Santavy (EPA). In addition to the 2005 hurricane season, the biggest surprise in 2005 was that the FKNMS was awarded a

second \$250K grant for the NOAA/South Florida Mapping Project via a Florida legislative initiative. The 2006 budget cuts will result in the loss of \$200K for projects, matches, and a Special Studies RFP in partnership with EPA. The budget also zeroed the science program's travel budget (BDK and assistant). FY06 prospects include continuing to receive external funding including CRCP appropriating about \$200K via BDK for UNCW and FWRI and the Florida Keys Initiative to fund benthic habitat mapping noted above.

Flower Garden Banks

Emma Hickerson

The Flower Garden Banks NMS major accomplishments for 2005 include a special issue of the Gulf of Mexico Science Journal on Flower Garden Banks NMS research and the cataloging of over 8,000 images into a geodatabase. Surprises in 2005 include the first widespread coral disease outbreak (many partners wanted to conduct studies), hurricanes Katrina and Rita, and the worst bleaching event on record. The budget impacts of 2006 resulted in the *R/V Pt. Glass* being sold. 2006 positive prospects include a \$3.2 million earmark for a new Research Vessel (90' catamaran with construction to begin summer 2006 and project delivery in late 2007). Challenges in 2006 include the office move to Galveston by June 2006 and the launch into the Management Plan Review process.

Gray's Reef

Greg McFall

The greatest accomplishment at Gray's Reef NMS in 2005 was achieving consensus on the design and placement of a Research Area in GRNMS. This was possible through Matt Kendall and Christine Harvey's (NCCOS) work to develop an analysis tool to guide the research area placement. The biggest surprise in 2005 was the 2006 budget cuts. These cuts will impact several long-term monitoring projects (including REEF) and several research projects that are necessary to collect preliminary data prior to establishing a research area. Prospects for 2006 include the site focusing on regionalization.

Gulf of the Farallones

Jan Roletto

Surprises for the Gulf of the Farallones NMS in 2005 were environmental anomalies such as variable upwelling and warm water conditions and increased mortality events in spring but fewer during post-breeding season. Other surprises in 2005 included difficulties to support and maintain SEA Stations, sharks damaging buoys, fishermen unable to avoid array in prime transit area to fishing grounds, data analyses and funding, and reduced oiled wildlife. The budget cuts in 2006 will result in the loss of funding for SEA Stations-West Coast Obs, tenuous partnerships will be placed on hold, data analyses and integration plans will be placed on hold, reduced Beach Watch funding and loss of funds for Biennial Research Workshop, research and education library, staffing on *FULMAR*, and the development of justifiable Special Permit Conditions for white shark disturbance regulation. The Gulf of the Farallones NMS Science Program has the following objectives for 2005-06: assess the sanctuary's information base; conduct studies of species or marine communities to identify resources most at risk or in need of management attention; promote the sanctuary as a site for management-related marine research; design, conduct, and facilitate characterization, research and monitoring projects that are responsive to management concerns and incorporate results into education and resource protection programs; and encourage information exchange and cooperation. A positive prospect for 2006 is that the Draft Management Plan will be certified which will be followed by staffing and funding. In addition, the Management Plan and SWiM Status Report will demonstrate the strong need for additional research staff and funding.

Humpback Whale

David Matilla

SPLASH continues to be the focus at the Humpback Whale NMS. 2005 accomplishments included the continuing success of SPLASH, various humpback whale rescues, the training of students, PIFSC workshop, International Whaling Commission, Korea MPA workshop, and outreach efforts in Tokyo. Goals for 2006 include finishing splash SPLASH (toxicology and fatty acid analysis, stable isotopes, informing management) and seeking other funds to complete additional analysis.

Monterey Bay

Andrew DeVogelaere

The highlight at Monterey Bay NMS in 2005 was completing the Davidson Seamount Cruise in partnership with MBARI. The seamount is located about 75 miles south of Monterey Bay and the goal of the cruise was to look for deep water corals. It is believed that a new species of coral was discovered, other species of interest included large sponges and tunicates. The next step is to age the corals and to determine why the corals are located where they are. Other key projects in 2005 included continued work on marine reserves (determining where to place them, using them as a decision support tool, conducting ecological assessments) and continuing the SIMoN project (a new State of CA grant will allow for mapping). The 2006 budget cuts will result in lost money for projects, therefore, the site will have to rely heavily on grants. Priority projects for FY06 include the deployment and use of the *R/V FULMAR*, assessment of recovery from trawling, the removal of invasive species (including Asian Kelp from harbor) and continuing work on marine reserves. A potential problem for the site is that they have received a lot of complaints from the MB Aquarium that the Sanctuary is conducting science operations outside the sanctuary, thus creating the perception that MBNMS is discouraging research in Monterey. A possible solution is to have the science team collaborate with the permit team. **Action item:** Greg McFall will be attending the permitting workshop in April; he will use this as an opportunity to present Andrew's concerns.

Olympic Coast

Ed Bowlby

The 2005 highlight at Olympic Coast NMS was the NOAA Fisheries combined west coast cruise that monitored seabirds and marine mammals (CSCAPE). The biggest surprise in 2005 was that after OE funding was secured to conduct deep water coral and sponge surveys the assessment could not take place because the ROV was no longer available. The 2006 budget cuts have required the site to scale back on feeding aggregation and prey surveys. NCCOS funding cuts has also required the site's biogeographic assessment to be postponed. In addition, West Coast Ocean Observing system cuts will impact additional efforts. Projects that are still on the table for FY06 include spending the OE funding, sidescan sonar mapping, and having MAC II ship time.

Stellwagen Bank

Ben Haskell

The primary accomplishment at Stellwagen Bank NMS in 2005 was getting an in-depth look at underwater humpback whale behavior through the use of digital acoustic recording tags. The biggest surprise in 2005 was successfully marshalling the resources of an ocean noise consortium to understand the noise budget of the sanctuary by placing 10 acoustic receiving units that cover ~83% of the sanctuary. This project will collect data for approximately a year. The second biggest surprise in 2005 was convincing the federal government and industry to back a proposal to the IMO to move the Traffic Separation Scheme traveling into Boston to reduce the risk of striking whales. The 2006 budget cuts will result in the loss of \$65K funding to Cornell University to analyze terabytes of acoustic data that is currently being collected from the 10 acoustic buoys. A positive development for 2006 is that external funding from the International Fund for Animal Welfare and Massachusetts Environmental Trust was obtained to hire an ocean noise specialist to work on bioacoustic policy and research. 2006 will also serve as a time to work off of the new *R/V AUK*.

NCCOS PARTNERSHIP

Presenters: Mark Fonseca and Patricia Hay

Summary: Information was provided on the status and location of reporting on the NCCOS-NMSP Long Term Agreement (LTA). Besides funding provided by NMSP to NCCOS during 2003-2005 (~\$2KK), NCCOS brought leveraged funding to those and other projects totaling ~\$8KK (FTE salaries not included), indicating a thriving collaborative relationship.

Good news was provided in that NCCOS was, in the face of significant budget cuts to NSMP, providing directed funding for projects under the LTA totaling (\$350K), additional support for other Sanctuary-related projects notwithstanding.

Fourteen active projects were summarized and will be provided in the form of single page, end-to-end documents to be posted on both NMSP and NCCOS web sites.

Program Managers Steve Gittings and Mark Fonseca were congratulated for being selected to receive the NOS Peer Recognition Award for their development of a conservation science partnership between NMSP & NCCOS. In FY05 NCCOS marshaled over \$5 million for research directly supporting NMSP needs. NCCOS benefits from the focus provided for its place-based ecosystem science agenda and this focus informs the application of NCCOS science to NOAA's strategic goals.

Action items resulting from the NCCOS Center Directors' Retreat in August 2005 were reviewed and NCCOS leads have been identified. The August meeting was the first time that NMSP participated in joint sessions with all NCCOS Center Directors. Action item topic areas included: ecological forecasting; a West Coast Ecosystem Symposium; Vessel/Aircraft coordination; data and information management needs; new roles for NCCOS with regard to the partnership; new documents to facilitate rapid communication of management issues/needs; and, revisions/additions to the Long-term Agreement.

Future activities were reviewed with special focus on improvements to the NCCOS website including: increasing the visibility of the partnership via NCCOS project links; NCCOS project one-page summaries; diagrammatic representations of NCCOS projects with regard to NMSP management needs; liaison reports; and a more visible link to the NCCOS Project Explorer.

Action items: Research Coordinators should remember to contact NCCOS when new research needs arise so NCCOS may attempt to assist. Web links from each site to NCCOS will be established, as appropriate to increase stakeholder awareness, improve outreach, improve leveraging with other funding sources and improve congressional support for our ability to help Sanctuary sites' research needs. Planning for non-LTA funded projects will be moved to late summer so as to jump-start collaboration in the upcoming fiscal year.

REEF UPDATE

Presenter: Steve Gittings

Summary: The Reef Environmental Education Foundation continues to provide valuable support to the NMSP. Program-wide, they are the most valuable source of fisheries independent data we have for species and biodiversity assessments. The data support regional evaluations of fishing pressure, the effects of harvest restrictions and zoning, allow the identification of areas of high diversity for ecoregional planning and the evaluation of the biogeography of fishes, and enhance our ability to discover new and non-native species. As of 2/10/2006, REEF's database had over 91,400 surveys in it, with approximately a third being from marine sanctuaries. In 2005, REEF presented papers at scientific symposia, participated in numerous public festivals, made many public presentations on fish identification, coordinated the Great Annual Fish

Count in July; continued to improve its outreach via the REEF website and other printed materials, began on-line data entry for census data, and provided raw data output to 17 parties requesting it. REEF surveyors conducted zone monitoring in Florida Keys and Channel Islands NMSs; assessments at Gray's Reef, Flower Gardens and Olympic Coast; field surveys in Monterey Bay and Hawaiian Islands Humpback Whale NMSs; and *Wellwood* restoration and *Spiegel Grove* monitoring in the Florida Keys.

We awarded a Base Activities Contract for FY05-Y10 that will allow any site to obligate funds for REEF support. For the third straight year, the Climate Data Modernization Program (CDMP) awarded REEF a grant that allows them to archive historical survey data and scan in all new census data. For the first time, CDMP has decided to consider a project "ongoing." That is, REEF will not have to continue to submit proposals. CDMP will continue to fund their work.

Plans for FY06 in national marine sanctuaries include continuing ongoing data collection projects, conducting zone monitoring in the FKNMS (grant from Dunn Foundation), finalize and launch a REEF census program for Fagatele Bay and American Samoa, and fully implementing online data entry in other regions (currently the only one is in western Atlantic). REEF also received funds to support the development of on-line mapping capabilities from a NOAA Coral Reef Conservation Grant. They also plan to add an invertebrate monitoring protocol to fish censuses in California, based on their successful experience doing so in the Pacific Northwest.

Comments and Actions: Sites are encouraged to use the new funding vehicle to allocate funds to support site-based survey activity by REEF and its members.

HMAP UPDATE

Presenter: Catherine Marzin

Summary: For the past two years, the National Marine Sanctuary Program has been engaged in an effort to assess the historical ecology of its sanctuaries. The first pilot project was undertaken through a grant to the University of New Hampshire, to assess the historical biomass and biodiversity at Stellwagen Bank NMS. In its second year, this successful effort has led to NMSP investing in other partnerships taking advantage of the wealth of historical documents generated by the project:

1. NMSP has digitized over 1000 photos, fishermen's interviews and log books from the US Fish Commission fisheries research vessels. These documents have been provided to the NOAA Central Library, and are now accessible for researchers through the Library's online search catalog. In addition, the library is now developing a new album featuring the US Fish Commission pictures in the NOAA photo library.
2. NMSP has been awarded a grant of \$50K by the Climate Database Modernization Program to further image and index US Fish Commission records held at the national archive. Among the documents to be digitized are original US Fish Commission Statistical Bulletins (1892-1920).
3. NMSP is working on funding a new project in the Florida Keys that will estimate the historical biomass and biodiversity of the sanctuary.
4. NMSP is developing a new partnership with France that will access French historical records pertaining to US marine resources, in particular in the sanctuaries.

WEBSITE DEVELOPMENT AND THE CONSERVATION SERIES

Presenter: Kathy Dalton

Summary: The National Marine Sanctuary Program's website was redesigned and launched in November 2005. Since the launch took place there have been 60,000 visits to the website, this is a 25% growth compared to the average number of hits during the winter. NMSP science issues are featured on the NMSP website, however, these webpages are still in need of considerable work. Please visit <http://www.sanctuaries.noaa.gov/science/welcome.html>. The Science Team will work with the NMSP webmaster (Valarie Thorpe) to improve these webpages, which will include reformatting the drop down menu to include sections dedicated to: Characterization, Monitoring, Research, In the Field, Conservation Series, Links and References. The Characterization, Monitoring and Research webpages will remain the same as what currently appears on the NMSP website. The In the Field webpage will be formatted similar to the MHP Expeditions page and will serve as an opportunity to highlight Science Expeditions currently taking place in Sanctuary waters. The Conservation Series will continue to be archived on the Science Pages. The Links webpage will serve as an opportunity for the program to highlight its many partners. The References webpage is a bibliography of important published materials coming out at the site level. The Science Team will be working to reformat the information that is currently posted on this page.

Comments and Actions: In the Field – Dalton will distribute a template that should be completed by RCs after the completion of a Science Expedition. The form will serve to summarize the purpose of the expedition, the expected findings, images and contact information. When completing these forms remember your audience is the general public! Once your form is completed return it to Dalton (Kathy.Dalton@noaa.com) and she will work with Thorpe to have the expedition added to the In the Field website.

Conservation Series – Consider using this opportunity to highlight work that is taking place in your Sanctuary! Dalton has created a template that can be used to assist with formatting manuscripts, please request that the authors use this template when they submit their manuscript.

Links – Send Dalton websites for any partners that you would like to highlight on the program's website.

Projects and References – It was noted that this title is a bit misleading, therefore, we will change the title to read "References". When an article or manuscript is published pertaining to science at your site, please send the citation and a pdf to Dalton and she will have it posted on the website.

AUV PRESENTATION

Presenter: Brendan Foley, Deep Submergence Laboratory, Woods Hole Oceanographic Institution, bfoley@whoi.edu, 508.289.3766

Summary: Whether faced with managing marine mammals, fish populations, coral reefs and other habitat, or cultural resources such as shipwrecks, it is essential to collect accurate baseline measurements of the resource, and repeat those measurements over extended periods of time to detect and monitor changes. For some resources, Autonomous Underwater Vehicles (AUVs) can provide to National Marine Sanctuary managers this foundation of quantifiable scientific information.

The Woods Hole Oceanographic Institution's Deep Submergence Laboratory operates several AUVs specifically designed for precision underwater surveys. These vehicles include the Autonomous Benthic Explorer (ABE), Sentry, and SeaBED. Unlike torpedo-shaped AUVs, the centers of gravity and buoyancy are separated on these vehicles, making them passively stable. This allows them to hover, or to operate at very slow speeds close to sea floor features. These AUVs carry scientific sensor packages that include

high-resolution still and video cameras, strobe lights, multibeam mapping sonars, side scan sonars, and environmental sensors such as fluorometers, conductivity-temperature-depth sensors (CTD), and most recently, an *in-situ* mass spectrometer. Virtually any sensor can be mounted on AUVs: they are very flexible platforms, and can be configured to meet the specific needs of science users.

AUVs offer advantages over many of the traditional methods of underwater data collection. Compared to divers, AUVs can go much deeper (at least 5000 meters), survey with far greater precision (survey placed within 1-2 meters in real-world coordinates, with <10 cm precision within that local survey), for longer duration (eight hours or more per dive, two dives per day), and higher speed (2-3 knots).

While AUVs' high speed is desirable for broad-area surveys, their ability to maintain precise control while moving very slowly is equally important for feature mapping; during photographic or acoustic data collection, low speeds enable very high data density.

AUVs deliver more precise navigation and positioning than towed sensors, making their surveys repeatable. This is essential for both science and resource management. AUVs' excellent terrain-following ability permits them to collect data in the "sweet spot" for particular sensors, or in much closer proximity to the sea floor than towed systems: operating within a meter of the sea floor or other features results in very high resolution data. Additionally, AUVs can be programmed to perform feature location and characterization within the same dive. In this 'adaptive survey' mode, the vehicle conducts a large scale survey and compares sensor inputs against user-defined criteria. Upon conclusion of the first survey phase, the vehicle returns to features deemed most interesting for close-up investigations.

Unlike Remotely Operated Vehicles (ROVs), AUVs do not require a cable. This tether-free capability opens new operational scenarios, such as under-ice missions. By eliminating the cable and its supporting winch system, AUVs can be deployed from smaller and lower-cost vessels. Compared to the operational costs of a dedicated science ROV, AUV surveys are less expensive. More importantly, for many applications AUVs generate higher quality data than any other vehicle configuration.

AUVs do have limitations. They do not perform well in cross-track currents greater than half a knot. They are not yet capable of manipulating and recovering objects. They also have very little ability to transmit data real-time.

However, a solution to the real-time data transmission problem lies in AUV hybridization. By attaching a fiber optic tether to the vehicle, data can be passed to scientists on the surface. WHOI is now building a hybrid vehicle with a 11,000 meter depth rating, and successfully has tested the hybrid concept with the ABE vehicle.

AUVs are mature, reliable systems and are being used regularly by a range of users. In fact, WHOI AUVs are already at work in National Marine Sanctuaries. Over the last four years, our team has partnered with Stellwagen Bank NMS to map shipwrecks, geology, and benthic habitats.

This collaboration between NOAA and WHOI is on-going; additional archaeological cruises using AUVs in Stellwagen Bank NMS are funded for FY2006 through a grant from the NOAA Ocean Exploration program. NOAA OE funds will also support WHOI's 2006 Aegean Sea survey of deep water ancient shipwrecks and an underwater volcano.

Day Three: Thursday, February 16

SWIM REPORTS

Presenter: Kathy Dalton

Summary: The Condition Reports (SWiM Reports) will be an Executive Summary of pressures, current state, and responses being addressed or considered at each sanctuary. They will be high-level documents intended for a general audience, be based on a “pressure-state-response” model, will use existing data, and contribute to resource Condition Reports at regional and national scales. The reports will have a consistent format (about 30 pages long and formatting will be completed by staff at headquarters) and will use information related to resource condition that comes from existing monitoring programs and other research ongoing in each sanctuary. All of the reports will contain a “State of the Sanctuary” section that will describe the current status of the sites in detail by addressing a set of questions that were outlined in the *Monitoring Framework for the National Marine Sanctuary System*. These questions relate to water, habitat, and living resource quality and are applicable across the system of sanctuaries (since publication an additional 3 questions relating to maritime archaeological resource quality have been developed and will be addressed in the Condition Reports). The results of these questions will also be summarized in the Condition Reports via “Status and Trends” tables. The reports will be published in a hardcopy format and will be posted on the NMSP website, which will allow users to interact with live URL links in order to access additional information. The reports will be prepared every 5 years.

Eventually, the results presented in these reports, especially as they relate to the set of 17 questions, will be synthesized into reports at larger geographic scales. It may also be possible to generate brief supplemental reports or chapters for specific resource types (e.g. marine mammals, coral reefs) and particular issues of interest (e.g. reserve effectiveness). The Condition Reports may serve to inform management decisions and assess effectiveness for individual marine sanctuaries. They will serve as important outreach materials, and will inform the public about site qualities and resources, threats, status and trends, and management responses to resource threats. They will also increase the visibility of the NMSP as well as that of efforts to conduct monitoring on a system-wide basis.

An approach to completing the “Status and Trends” portion of the report was discussed. A model, tested by the SBNMS team includes:

1. Gather *data sources*.
2. Develop *overview* of site history and resources using existing data (e.g., State of the Sanctuary report).
3. Identify primary *pressures* on sanctuary resources, and develop a “snapshot” of each.
4. Respond to the standard *17 questions* utilizing site staff and other partners/experts for each topic. Resource status and trends and supporting basis for judgment information is summarized in the “*State*” section. Use time-series graphics, when available.
5. Summarize *responses* (actions, guidelines, regulations) to pressures, including proposed actions identified in Management Plan updates.
6. *Review* process and finalization of the report.

Options for answering the 17 system questions were also discussed. Possibilities include:

- Conduct workshop with resource experts (water, habitat, living & maritime) to address each question.
- Individual interviews with resource experts to address each question.
- Sanctuary staff complete initial draft and request expert input and review

A timeline for completing the reports was distributed and includes:

- Channel Islands – writing to begin after RC meeting
- Cordell Bank (began October 2005) – report has been drafted, currently developing responses to

- the 17 standard questions
- Fagatele Bay (began December 2005) – report has been drafted, beginning efforts to develop responses to the 17 standard questions
- Florida Keys – writing to begin in April 2006
- Flower Garden Banks (began February 2006) – beginning first draft
- Gray’s Reef (began February 2006) – first draft complete and currently under review
- Gulf of the Farallones (began January 2006) – first draft complete and currently under review
- Humpback Whale – writing to begin after RC meeting
- Monterey Bay – writing to begin after RC meeting
- Monitor – writing to begin after RC meeting
- NW Hawaiian Islands – writing to begin after RC meeting
- Olympic Coast – writing to begin in February
- Stellwagen Bank (began January 2005) – currently under final review. Final formatting to be completed by March 2006.
- Thunder Bay – writing not to begin until FY07

The reports will also need to undergo a review process standardized for all sites. We are required to meet the requirements of the Data Quality Act and the Peer Review Guidelines for Influential Scientific Information (ISI). All comments must be posted on the Department of Commerce website.

Comments and Actions: Following the RC meeting Dalton will touch base with each RC to formulate a plan to complete their site’s report. In the meantime, all RCs should read the Statement of Work, Data Quality Act & Peer Review Guidelines for ISA and HISA. Gittings will prepare a draft review plan for the reports and distribute for comment.

SCIENCE NEEDS: END-TO-END SCIENCE ACCOMPLISHMENTS AND NEEDS

Presenter: Steve Gittings

Summary: The NMSP was invited to provide a congressional briefing on March 6, 2005, just two weeks after the Research Coordinators meeting. We used the meeting to begin to generate one-page summaries of examples of science being used to drive sanctuary management decisions and actions. We agreed to an outline for the documents and were able to generate several during breakout sessions. Everyone agreed to submit more within a week of the meeting. The result is a package of approximately 20 examples. The entire package was presented in printed form during the briefing, and will be converted to a Conservation Series issue on science accomplishments. Several were presented orally during the briefing by the managers of the sanctuaries (vessel routing relative to whale aggregations – Craig MacDonald; Tortugas Reserve design, reserve effectiveness, and seagrass restoration – Billy Causey; Channel Islands Reserve boundary selection – Chris Mobley; and topographic feature characterization and protection – G.P. Schmahl).

Comments and Actions: Expect to follow this activity with one related to updating our sciences needs. Over the next couple months, sanctuaries will be asked to submit one-page summaries in a similar format that convey priority science needs for the sites and regions.

REGIONAL STRUCTURE AND SCIENCE COUNCIL DISCUSSION

Presenter: Steve Gittings

Summary: The first meeting of the newly formed Science Council occurred the day before the Research Coordinators Meeting. The group discussed the drivers, purposes, and strategic linkages of the Council, membership, operations, member roles and responsibilities, communication protocols, and schedule. The initial members of the Council, serving two-year terms in most cases, are Steve Gittings (Program Manager), Mitchell Tartt (HQ rep), Ed Bowlby (west coast rep), Nancy Daschbach (Pacific Islands rep),

and Brian Keller (east coast rep). Sitting on the Council with *ex officio* status are John Broadwater (Maritime Heritage Council lead) and Michiko Martin (Education Council lead). Currently, the Great Lakes/Northeast, and the Southeast/Gulf of Mexico regions provide a single representative to the Council, as only one site focused on natural resources exists in the Great Lakes/Northeast Region.

Primary responsibilities of the Science Council are to:

- **Advise** the ONMS Executive Team and provide recommendations on conservation science needs and priorities
- **Communicate** at all levels regarding science operations, opportunities, priorities, and strategies
- **Coordinate** activities and opportunities among sites, within regions, and nationally

Council members will be responsible for dissemination of information to ET, regional superintendent, regional research coordinator, managers, and staff; help prepare and review regional AOPs; participate in regional fleet allocation meetings; promote regional collaboration with such entities as NMFS regional offices, NCCOS, the National Park Service, IOOS, and others; and support numerous other regional and national activities.

Comments and Actions: A charter for the Science Council will be drafted initially by Steve Gittings, then distributed for comments, additions, etc. A conference call will be held in May and serve as the quarterly meeting of the Council. Topics of discussion are likely to include FY07 AOP preparation, status of SWiM condition reports, fleet allocation, and the science needs assessment. John Broadwater encouraged the Council to keep in mind, especially during fleet allocation, that maritime heritage projects can often successfully piggyback with natural sciences efforts. He also briefly discussed the maritime heritage “Tiger Team,” which is available to assist sites with project and support site needs.

PROGRAM DIVING ISSUES

Presenters: Mitchell Tartt

Summary: Two topics were presented; volunteer diving and advanced diving. Volunteer diving from the NMSP is an issue that faces many sites. The NMSP has the authority under the NMSA to accept support of volunteer divers. However, there is not a consistent approach in place to evaluating and working with volunteer divers. Impacts to dive operations, diver safety, and liability are of concern, as well as the increased risk that is generated by using volunteer divers in field projects. The NMSP and the NOAA Dive Program are currently addressing the issue of volunteer divers and working on possible NOAA-wide guidance relative to volunteer diving activities. Significant concerns remain relative to medical insurance, workman’s compensation, and liability. Resolution to these issues is likely to be handled at the program level within NOAA. Volunteer divers will be a topic of discussion at the upcoming NOAA Unit Dive Supervisors Meeting, in Seattle Washington. Over the next several months, the NMSP will be establishing program-wide standards and requirements for using volunteer divers in Sanctuaries.

The NMSP is supporting a workshop to be hosted in March, 2006, by the Smithsonian Institution. This workshop will focus on issues relating to advanced diving and diving to depths of 300 feet. The NMSP Director is in support of the advanced diving to meet NMSP requirements; however, the interest is in addressing the needs we have using external capabilities, not in developing the capability in our program. We will address this at the Smithsonian workshop as well as other NMSP needs where deep diving technologies could support our missions. Topics will include deep coral monitoring, submerged cultural resource assessments, CINMS reserves monitoring, habitat characterization, and other NMSP science needs.

Comments and Actions:

- Information stemming from the UDS meeting and the Smithsonian Workshop will be sent to all RCs.
- NMSP Volunteer Diving Guidelines and requirements will be drafted and sent out for review. All RCs with interest should provide comment.

SITE CHARACTERIZATION

Presenter: Mitchell Tartt

Summary: A brief summary was provided of the requirements of the NMSP to characterize the resources and processes of each National Marine Sanctuary. These requirements are established by the National Marine Sanctuaries Act, a Congressional requirement defined during the reauthorization of the NMSA in 2000, the Office of Management and Budget and the NMSP PART Evaluation, and defined NMSP Conservation Science needs. An assessment of the status of this work and a plan to complete adequate characterization for each site should be completed by the end of FY06.

Comments and Actions:

Science Team will be reporting to NOS and OMB at the end of the fiscal year on the status of characterization in the NMSP.

PROGRAM PERFORMANCE MEASURES

Presenter: Mitchell Tartt

Summary: There are four program performance measures that pertain to conservation Science in the NMSP. The first relates to characterization and states “by 2015 100% of the sanctuary system is adequately characterized for management”. This year, the target on record is that the NMSP will be 80% characterized. To demonstrate this, the NMSP will package all of the existing characterization information in a manner that is accessible and organized system-wide. Three other measures relate directly to long term monitoring. These state that “The number of sites in which *water quality, habitat and living marine resources*, based on long-term monitoring data, is being maintained or improved. The SWiM Condition reports will be used to report on progress towards these measures. The final measure addresses “the number of sites with an ocean observing system component to site monitoring programs. By 2006, the target number is four and for 2007 the number is seven. Reporting on these measures will be handled by the Science Team and will take place at the end of FY06.

Comments and Actions:

Science Team will report on the process of each performance measure to NOS and OMB at the end of FY06.

FY07 PRIORITIES

Presenter: Mitchell Tartt and Steve Gittings

Summary: The group discussed the process for developing FY07 priorities, which will involve the councils acquiring information on candidate priorities from coordinators at the sites and passing it through the Strategic Planning Team, which will repackage it for Executive Team review and selection. We listed FY07 candidate priorities based on a hypothetical \$32 M budget. The priorities took into consideration impacts from FY06, program directives from FY06, management plan requirements, monitoring and characterization needs, and key performance measures (e.g., obs systems and marine zone effectiveness).

A brainstorming session resulted in a list of program priorities for consideration by the Strategic Planning Team. The two highest priority items were:

- Monitoring – (e.g., allocation staff time and contract support to complete SWiM reports as well as continuing long term projects at sites)

- Ensuring funding for vessel operations at the sites, as well as funds for contract charters at sites without vessels or those who need supplemental field support

Other recommendations on the list included:

- Building out SIMoN (website)
- Ensuring continuation of West Coast observation system
- Analysis of CSCAPE data acquired in FY05 (west coast marine mammal and seabird data collected in cooperation with NMFS using some west coast obs funds and sanctuary and NMFS ship time)
- Reinstating science mini-grants program
- Continuing acoustic characterization work at sites
- Implement sanctuary mapping plan
- Support NCCOS efforts, particularly for continuation of biogeographic characterizations
- Conduct regional science and monitoring planning workshops and perhaps combine them with regional vessel planning workshops
- Conduct annual research coordinator's meeting
- Compile existing characterization data for the sites
- Ensure science staffing levels are adequate (e.g., backfill FKNMS Research Coordinator position)

Comments and Actions: These priorities will be forwarded to the Strategic Planning Team for incorporation into the FY07 AOP guidance. Those that are approved by the Executive Team will be incorporated into the annual guidance memo, which instructs the Leadership Team on procedures for AOP preparation and provides content guidance.

Day Four: Friday, February 17

IMAST

Presenters: Christine Taylor and Jaeson Abraham

Summary: This is the 3rd year that IMaST has been presented at the RC Meeting, however it has developed much beyond its original intent. With the inclusion of Jaeson into the team we now have the ability to deal not with only Geospatial Issues, but also with Information Systems in general. The new focus includes the three major elements of IMaST. These are management, integration, and program development. Management includes the GIS resources and technologies. Program development includes all information systems development and integration, including those projects that bring the two together into innovative products and solutions. This is basically an enterprise approach to information management. In the area of management, the IMaST working group has put together a document which shows the current geospatial capacity at each site based on personnel, equipment, software, training, expertise, and data availability. This document also makes a determination of how well each site is meeting its current geospatial needs, and makes recommendations for the future.

The IMaST group has also managed to create its own well maintained Intranet site, and is currently working on a Spatial Data Engine for GIS and related data storage, with a front end of an Internet Mapping System so that basic data layers will be viewable, downloadable, and accessible to anyone who needs them without the need for GIS software.

In the area of program development, Jaeson is putting together a guidance document for system development methodologies which needs to be followed prior to the start, during and at the end of any development of information systems, whether in house or through a contract. The idea is that this will ensure that projects develop according to their goals and needs. It also ensures that site, regional, national or external projects develop according to national criteria and policies.

Comments and Actions: IMAST covers a broad area of information systems, guidance, data dissemination and structures, sharing knowledge and personnel expertise, etc. Please let your IMAST representative know what you are currently working on, what tools you may need, and what you have planned in the future. You might be surprised how preplanning can help your efforts. The team had its 2nd annual meeting the week after the RC Meeting in Oahu. Notes from that meeting will be available on the Intranet site.

DATA COLLECTION AND CONSISTENCY ON NMSP FUNDED CRUISES

Presenters: Christine Taylor

Summary: There is a problem with metadata and data consistency in almost all data captured in the field where data planning isn't involved. This problem is not specific to NMSP, but needs to be addressed. In order to be FGDC metadata compliant or DMAC compliant, metadata must be attached to any data that is served to the public. This will very soon apply not just to government, but also to academic institutions (your university partners). On the "just because it makes sense" side, we should be consistent and thorough in our data logging in the field, and we should demand it when we can. OE is using a program that they call the Exploration Information System to log data while it is being captured. At least one person is assigned on each cruise as the data management professional. This is not a PI or a researcher (in order to free the researcher to do the work required). OE is currently redesigning this system, and Chris will be keeping track of this progress. Chris suggested that NMSP adopt this or a similar system on all NMSP funded or staffed field research endeavors. It was suggested by some of the RCM participants that at a minimum we could provide the system on our vessels and require its use whenever anyone uses them.

SEABED MAPPING PRIORITIZATION PROJECT

Presenters: Christine Taylor

Summary: Chris has been keeping track of the seabed mapping priorities for all of the sanctuaries and making sure that the information is given to the Office of Coast Survey (OCS) so that overlapping needs, and surveys of opportunity can be achieved in our areas of need. This has already worked in the SB and FGB areas in the last year. This dataset is an evolving one, and sanctuary sites should keep Chris updated as needs and priorities change for whatever reason. Most importantly, let Chris know if an area has been surveyed or a survey plan is in the works.

Last May a workshop was held at UNH to help us develop standards for seabed mapping criteria. We let our partners and most frequent survey data suppliers know what type of surveys we need and why. Because OCS surveys often do not meet habitat or maritime archeological needs, and habitat and MH surveys often don't meet IHO standards that OCS must adhere to, and because surveys are time consuming and very expensive, we discussed the possibilities of getting our survey needs fulfilled while also adhering to IHO standards. The basic outcome was to determine that our surveys need to be IHO compliant whenever that can be accomplished. If there is overlapping need in our areas of interest with those of OCS our contract surveys will try to plan a survey that is IHO compliant with the help of OCS. If this is not economically feasible, OCS should be asked if they want to contribute to the survey costs in order to achieve compliancy. If on the other hand, OCS IHO compliant surveys do not actually meet our needs, they will, if possible try to meet our needs as best they can and we will attempt to help with resources if we can. In many cases this could be personnel.

Cost analyses for planned surveys can be done on a survey by survey basis. Formerly we wanted to create an overall cost analysis for the entire program, but given all the differences in equipment, sea states, weather, depth, number of turns, etc. There are too many factors to predict years in advance.

Chris also wants to create a geo-database of existing surveyed areas geospatial footprints. This is being done for NOAA data through NGDC, but sanctuaries use data from other sources too. The idea is to keep an updated database of survey data that is available on-line. If you know of data sources for Chris, please email her the link.

NMSP ATLAS PROJECT

Presenter: Christine Taylor

Summary: Chris went over the elements of the maps for each of the sanctuary sites. All sites will, by this May, have an atlas page. This is not a biological, benthic, or policy structured map, but one that shows a general view of the area in which the sanctuary is situated. It will show topo/bathy at a large scales, geophysical features, roads, place names, towns, office and display locations, and other well known government managed areas such as national parks. Half of the maps are completed and can be viewed on the photo gallery page of the sanctuaries.noaa.gov site. These maps will be incorporated into a larger document which will include additional pages giving pertinent details about each sanctuary that may not be found on the map. The current plan is to have Meade Office Products publish the Sanctuary Atlas for their sale at their distribution centers. However these maps will be made available to sanctuary staff as Adobe Illustrator files so that they can be altered by the sanctuary staff for individual site needs.

Comments and Actions: For those sites that haven't yet been through the process there are a number of things that need to be considered.

- Each map needs a Point of Contact at the site
 - o Must be generally available
 - o Must be able to turn around edit requests in less than a week.
 - o Must know what features and information are important to the site.

Day Five: Saturday, February 18

UAV TRIALS

Presenter: Todd Jacobs

Summary: A series of demonstration flights of Silver Fox and Manta Unmanned Aerial Systems (UAS) were conducted at Opolu Point on the island of Hawaii February 13 through February 18, 2006. The Silver Fox is a small and relatively simple UAS that was developed with Office of Naval Research (ONR) funding to function primarily as an "expendable over the horizon surveillance tool" that could be launched from ships and/or from land. It carries optical and infrared camera systems and sends real-time images to the command console. It is controlled via line of sight communication and has an effective operating range of 20-plus nautical miles. The primary interests were in evaluating the Silver Fox UAS for: tracking whales and small vessels; and identifying and documenting the activities and locations of individual vessels. The URL for the Silver Fox and Manta is:

<http://www.acrtucson.com/UAV/index.htm>. Todd Jacobs led this evaluation, and also represented the NOAA UAS Program, which is composed of the NOAA UAS Steering Committee and Working Group. The NOAA UAS Steering Committee and Working Group are formal bodies that serve as NOAA's focal point for collaboration and information regarding the application of UAS technology in the accomplishment of NOAA missions. The mission of the Steering Committee and Working Group is to make recommendations to NOAA's Line Offices (LO), Goal Teams, and Programs on the application of UAS technology to fulfill critical research and operational gaps. CAPT. Craig McLean serves as the NOAA UAS Steering Committee representative for NOS. Todd serves as the NOS Working Group representative. The URL for the NOAA UAS Steering Committee and Working Group is: <http://uas.noaa.gov/steering/index.html>.