



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of National Marine Sanctuaries
Stellwagen Bank National Marine Sanctuary
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35th SANCTUARY ADVISORY COUNCIL
16 February 2012 9:30 am – 3:30 pm
Holiday Inn, Rockland, MA
MINUTES of MEETING

Present:

Jennifer Anderson	Federal:	National Marine Fisheries Service
Michelle Bachman	Federal:	NE Fisheries Management Council
Jamie Cournane	Member:	Research
Deborah Cramer	Member:	At Large
Rich Delaney	Member:	Education (Chair)
CPT Peter DeCola	Federal:	USCG
Susan Farady	Alternate:	Education
Robert Foster	Alternate:	Diving
John Galluzzo	Alternate:	Maritime Heritage
Peter Gamache	State:	Massachusetts Environmental Police
Heather Knowles	Member:	Diving (Executive Committee, Acting Chair)
Judy Laster	Alternate:	At Large
Bob McCabe	Alternate:	Marine Transportation
Chris McGuire	Alternate:	Conservation
Maggie Merrill	Alternate:	Business/Industry
Tim Moll	Member:	Business/Industry
Rob Moir	Member:	Conservation
Rick Murray	Member:	Research
Robert Rocha	Alternate:	Education
Michael Sosik	Member:	Recreational Fishing
John Williamson	Member:	At Large (Executive Committee, Secretary)
Tim Willmore	Federal:	NOAA Law Enforcement

SBNMS Staff:

Craig MacDonald	Matthew Lawrence	Elizabeth Stokes
Ben Cowie-Haskell	Deborah Marx	Alice Stratton
Brad Cabe	Anne Smrcina	Nathalie Ward

Others Present:

Paul Ticco, ONMS, NE & Great Lakes Region
 Kara Woo, ONMS HQ Intern

I. Welcome, Review of Agenda and Approval of SAC Minutes (Rich Delaney)

The Agenda was reviewed and approved. The 34th SAC Minutes were approved (unanimous).



Two new SAC members were welcomed: Pete Gamache, Mass Environmental Police, and Tim Willmore, NOAA Law Enforcement Program.

II. SBNMS Business (Craig MacDonald)

i. Sanctuary Budget. FY08 to FY10 has seen level funding. There was an increase in FY11 funding due to an additional staff member, Alice Stratton who was transferred from ONMS Headquarters, and also because the ONMS Program Director has made an effort to allocate more of the national headquarters budget to the sites. The sanctuary is in a better position going into FY12 than previously anticipated. Funding for fixed costs (i.e., labor, maintenance, and service contracts) has been allocated. However, no discretionary funds have been allocated to cover other expenses. There are no large grants at the moment, as in the past, such as Navy funds for acoustics research. Sanctuary staff will need to place more reliance on partner agreements and teaming with other organizations and grant writing to make up for this shortfall. There are no PAC funds allocated (capital planning acquisition funds) to renovate and convert the boathouse to a marine operations center. These funds have been down since FY08, but not yet firmly allocated for FY12. But we do know that we were to be provided \$55K for *R/V Auk* and possibly \$75K for sanctuary exhibits. There is a remote possibility of small additional funding depending on some pending issues with NOS.

ii. 20th Anniversary Celebration and SAC Challenge.

Nathalie talked about the upcoming 20th anniversary events and thanked SAC members who have contributed to this celebration. SAC members who have not yet provided Nathalie with a one-pager description of their event are asked to do so. The 20th Anniversary events are posted to the Sanctuary website.

III. SAC Business (Nathalie Ward)

i. Council “Round Robin”. SAC members and alternates introduced themselves and provided updates of their respective organizations and issues, as well as an update on their 20th anniversary contributions.

ii. Future Recruitment. There are two recruitments ongoing for Research Alternate and an At-Large Member (Theresa Barbo, At-Large stepped down). Nathalie will inform SAC members once the Federal Register Notice is released. SAC is also recruiting for a Youth Seat (Member and Alternate). Applications and criteria will be posted to the SBNMS website.

iii. 2012 SAC Meetings Dates. The next SAC meeting will be held in June. Meetings will be reduced from 4 to 3 due to budget constraints. *Update: Next SAC meeting will be held on Thursday, 7 June, at the Northeast Regional Office in Gloucester.*

iv. SAC Summit Webinar (April 2012). The annual SAC Coordinators Summit will be held in April in webinar forum since no funding is available for SAC Coordinators to meet. Nathalie asked SAC members to share any specific concerns that NMSP or SBNMS needs to raise at the upcoming SAC Summit. Dan Basta attends these meetings and wants to hear any concerns SAC

members may have. Rich Delaney will provide a report of SAC Summit issues at the next SAC meeting.

v. Programmatic Updates. Nathalie provided an overview of the programmatic updates that SBNMS staff provides. This report is sent to SAC members before each SAC meeting. It summarizes progress and future steps in the various programmatic areas and is sent by email rather than having staff provide oral briefings at each SAC meeting. (See Appendix for a summary of programmatic updates for this reporting period).

vi. SAC Youth Seat Subcommittee (Dave Robinson and Rob Moir). Rob Moir provided the SAC Youth Subcommittee update. The process is proceeding according to schedule. The SAC Charter has been amended to add an additional youth member and alternate (14-18 years old). Nathalie is preparing an announcement for the Federal Registry Notice calling for applicants for these positions. She will also host the selection process. Applications will be submitted by 27 April. The SAC Youth Seat Subcommittee will then convene and give their nomination recommendations to Nathalie to forward to the SAC Executive Committee for Executive Committee's considerations. This will be done in time to share with SAC at the June meeting. A number of organizations and school groups have offered to get the word out, and SAC members discussed additional methods to get the word out to a larger audience. More SAC members are needed to join the subcommittee. SAC Youth Seat Subcommittee members are:

Rob Moir
Jamie Cournane
Susan Farady
Dave Robinson

vii. SAC Leadership Award Subcommittee (John Galluzo). John stated that all the necessary forms and paperwork are finalized and nominations are now needed. Rick Murray volunteered to help on the judging committee, but more SAC members are needed to help on the judging committee. SAC members are asked to contact John Galluzo if interested in being part of the judging committee.

IV. Sister Sanctuary Program (Nathalie Ward). Reported in her capacity as External Affairs Coordinator and SBNMS international affairs. Nathalie provided an overview of the sister sanctuary program: The Sister Sanctuary relationship, established in 2006, between Stellwagen Bank National Marine Sanctuary (SBNMS) and Santuario de Mamíferos Marinos de la República Dominicana (SMMRD) marked a new chapter for the *joint* management of the endangered humpback whale (*Megaptera novaeangliae*) in the North Atlantic. The sister sanctuary was the *first* international accord to protect an endangered marine mammal migratory species on both ends of its range—in its northern feeding and nursery grounds in SBNMS and its southern mating and calving grounds in SMMRD. The sister sanctuary relationship 1) facilitates an ecosystem-based approach to cooperative sanctuary management of humpback whales through capacity building, research, monitoring and education; 2) serves as a template to elevate national and international awareness of the importance of the ecological connection between these marine mammal protected areas; and, 3) emphasizes the critical need to take a broader management view toward transboundary conservation of marine mammal species. The sister

sanctuary concept is part of a larger international and global vision of Marine Mammal Protected Areas (i.e., UNEP's Specially Protected Areas and Wildlife Protocol for the Wider Caribbean Region) that prioritizes management regimes that maintain ecological connections between marine protected areas in order to satisfy species' requirements. The sister sanctuary model promotes a strategy that defines emerging problems (beyond EEZs), kindles commitment to critical habitats, and manifests the true spirit of regional cooperation, which is a key element to ensure effective management for biodiversity protection and the conservation of migratory, marine mammal species. In 2011, SBNMS signed a sister sanctuary (SS) agreement with the French Antilles Agoa Marine Mammal Sanctuary and a Letter of Intent, expanding the sister sanctuary programme.

V. SERA Update (Craig MacDonald).

Presentation:

Craig gave a PowerPoint update on the proposed SERA. There was concern raised by some SAC members that findings were based on data from 1998-2009 prior to sector based management and that fishing patterns may have changed in 2010 as a result of sectors. Craig indicated that he is consulting with NERO on how best to analyze the 2010 VTR data. Once he gets input from NERO the plan is to incorporate the 2010 and eventually the 2011 VTR data and analyze changes in fishing patterns with respect to SERA boundaries.

Questions/Discussion on Presentation:

Some members expressed concern about the increased number of boats fishing in the sanctuary and questioned whether this was real or an artifact of the data. Craig explained that the number of vessels is based on the unique hull IDs of vessels fishing within the sanctuary. We verified the VTR data against the observer data and feel confident about the analysis within the SERA subareas.

Michelle Bachman talks about council process and PDT actions. Aspects that are currently in the process. Management options are based on minimizing adverse effects of various types of gear fishing and assessing possible research areas.

Craig MacDonald. A robust vigorous draft proposal for the SERA is on the sanctuary website. Until the proposal is formally submitted by NOAA to the NEFMC, it will not be formally treated by the Council. How to get it back on the table. Anyone can read the proposal and submit it to the Council for consideration. As a draft we have little ability to directly advance what we feel are the needs of the sanctuary. Can use the information but cannot formally transmit it to the Council. It's a very awkward situation for everyone involved.

Deborah Cramer: What was the response and outcome of letters by scientists and John Williamson?

Craig MacDonald: We don't know what the response will be. The letters were sent to DOC and congressionals and one to head of NOAA. Didn't see letters and don't know about any response.

John Williamson: Two letters – one to Senator Kerry from scientists, and the other two from four interest groups to DOC Secretary Bryson and another from Friends groups through NMSF to Secretary Bryson; no response -- not unusual -- about 1 ½ months now. May still be forthcoming. Suggested that this discussion be picked up after Jen Anderson gives her report. GoM cod problem is holding everything over this proposal as well as the sector politics.

Rich Delaney: No reason why the members of the NEFMC's Plan Development Team (PDT) cannot look at the elements of the science and information that went into the proposal and can use it as conceptual info. NEFMC could look at document.

Michelle Bachman: Council very sensitive to public perception, it is an awkward situation. Trying to hash out details through a working group can't say what kind of knowledge and background will be at the table, but everyone knows that it's out there and some of their thinking will be informed by the SERA. At this stage, PDT won't be reviewing it as an entire proposal with all its elements, maybe just turning it into some type of management option tool. NEFMC will not take up an issue that does not have entire support from NOAA. Certainly it has been reviewed by a lot of members of the PDT. If SAC as a whole would recommend it, the NEFMC would speculate why the sanctuary isn't submitting it.

John Williamson: Really important that NEFMC is an open public process. Folks need to understand this. There are opportunities for fishing public to get up at Council and committee meetings and make their concerns and interests known. Fishing industry groups can bring in entire concepts to be flushed out. These get incorporated into the planning. Interests of the general public are not treated necessarily the same way but the general public needs to make these wishes known. Need for general public to go to these meetings and say what they want – make their ideas known.

Chris McGuire: At the last NEFMC meeting a motion was made to include an emergency action to open a number of closed areas to include Sliver in the W GoM. Question: If that were to be opened on an interim basis for a year, what effect long term would it have on research going on in that area?

Craig MacDonald: If the Sliver went away we would see a \$3m investment go away, a remarkable investment in fish habitat recovery. It is serving as a relatively unimpacted reference site to understand what's happening. The sanctuary would go completely out of business for habitat research. Was told that the vote on the motion was taken primarily on the groundfish mortality portion of the closure. It was our understanding that the habitat closure would not be affected by this vote at the last Council meeting.

Back and forth discussion on habitat closure areas/habitat mortality closed areas, etc., and opening up Sliver and NEFMC process.

Jen Anderson: Can't speak on Council why members voted the way they did. The Council requested that the agency take interim actions and she described them. Agency agreed to look

into all of this. Premature to say what's going to happen but agency will take everything under consideration.

CPT Peter DeCola and John Williamson: Intent of motion includes habitat closure.

Chris McGuire: It does not refer to habitat or mortality – just ‘closures’. Almost entirely in the habitat closure area. Encouraged that the time frame is very short -- trying to move forward with these things as quickly as possible.

Craig MacDonald: Response to Chris McGuire about what sanctuary interests and concerns are. Opening up Sliver? Would very strongly oppose it.

Jen Anderson: If NMFS would take action, would need to have a NEPA in place and with the time constraints also being looked at to get something in.

John Williamson: Agree. There is a real need to call attention to a whole set of issues - the cod issue. Dire for 2013. More at stake than fishery and habitat.

Craig MacDonald: The closure motion was raised with no reference to map/chart after 11 hours of meeting that day and a lot of people had already left.

Jamie Courneane: NOAA needs to recognize SERA by June or before the June NEFMC meeting?

Michelle Bachman: Assuming NEFMC considers these options in June which is optimistic. Needs to be recognized by early May at the latest for time to get feedback on it from the PDT in order to recommend it back to the Council end of June. Ideally April would be easier. More talk about time line.

Afternoon Continuation Under “IX. New Business”.

Susan Farady: Sanctuary's posture in terms of the SERA and also in terms of what may be proposed at the ground fish closed areas. Is this something to go before the Chair and coordinators meeting with Dan Basta or general counsel, so many discussions at this body and so many presentations about how the sanctuary interacts with NOAA Fisheries. The takeaway she gets is that it doesn't matter what the Sanctuary superintendent recommends in terms of interaction with fisheries unless NOAA agrees to take it forward. This is interesting and troublesome especially where we have a couple of “house fire” situations here in New England. So maybe the sanctuary program should go over to the DOI and leave everybody else in DOC. Strikes me that the sanctuary is in a situation like this trying to talk to another agency, the sanctuary should be treated differently than just as another member of the public or stakeholder. It's an inter-agency consultation sort of thing, yet because of this little dance that we have to do under the same agency, it gets pretty convoluted.

Paul Ticco: The SERA is bottlenecked at NOAA and NOS level. There are socio-economic issues, political issues that's why we are stuck. Relationship is improving and other issues are

being worked. There is constant coordination and communication at NMSF and Dan's level (ONMS). There is ONMS level, NOS level, sanctuary and NMFS level - Not near a dead issue - it's being worked on with new data new studies and new relationships issues, it's a convoluted, long term process. Goal is to establish the best way to go through that process. Totally issue related. This issue is at the forefront of frustration. Goal is to establish the best way to go through that process. He cannot speak for NOAA. He's working on the same issue with sanctuary staff to get the SERA to move forward into the process.

Craig MacDonald clarified Paul Ticco's position. Paul's role has been in a position to help us facilitate this process. Paul is the regional coordinator NE&GL Region and is trying to facilitate the process and move the proposal forward. It's essentially people in positions above him who are trying to decide next step.

Deborah Cramer: Appreciates that it's convoluted and that everybody is communicating, but bottom line is that we were told pretty explicitly that we could not do anything without going to NEFMC. Now we're trying to do that and we are told we can't do that. It cannot be nothing, it has to be one or the other. After a great deal of difficulty the sanctuary followed that advice but where did this get us. May pay more attention to it if SAC submits it.

Public member speaks at this point chastising NOAA for obsfuscation.

Rich Delaney: Need to examine our frustrations and our role as SAC.

John Williamson. ONMS is not the problem. They've been doing everything they can to move the SERA proposal forward. Reiterate to move this forward, citizens need to have just as much say as fishing interests. Economic analysis has been used against the proposal falsely.

Jamie Cournane: SERA proposal should be part of the NROC process.

Craig MacDonald: I don't think it will be offered into that process. Proposal is on the website. It is ready to go forward.

Rich Delaney: Put it on the table.

Susan Farady: Leary of this with NROC. There is a real problem here. Directly impact jurisdiction of the sanctuary. Sanctuary Act versus Magnusen Stevens Act. Entitled to carry out two laws and one isn't being treated on equal footing. Sanctuary is in a real bind right now, really at a stalemate. Concerned with crisis in the fishing industry right now.

Rich Delaney: BOEM (DOI Bureau of Energy Management) is participating in Marine Spatial Planning (MSP) up and down east coast.

Paul Ticco: No doubt that Dan and ONMS favor the draft SERA proposal. It's really an issue of going through the process of getting all the voices heard. This is the position we're in. There are political issues of the next election that play into it.

Ben Haskell. Two critical hurdles in the next couple of months. Public needs to make their views known at Feb 23 Habitat committee in NH, second hurdle likely the June Council meeting when they vote on habitat measures. Keep that in mind, that's where the voice needs to be heard.

Rich Delaney: Send another letter?

John Williamson: Letter to NEFMC explaining what the process has been and that we support it.

Rob Moir: What can the SAC do to help move forward any charge of SERA in the planning process? NOAA can't do anything right now. So what can the SAC do? Bottom line is to help influence the habitat committee. Don't need to get everything we want. Attach the proposal...mention the SAC's majority vote.

Discussion ensued on whether to send a letter to NEFMC supporting the SERA.

Jamie Cournane: If someone on the habitat committee wants to accept it, they could. Awkward situation because it would be introduced by the SAC. Would a motion like this pass the habitat committee? Concerned doing this circumvents the process in a way and creates a problem to get this into the management process. Circumventing the process may be too risky. As much as I'd like to see it move forward, it may be too risky.

Craig MacDonald: How would the Council react?

Michelle Bachman. Probably not accepting but finds herself consistently surprised by decisions that are reached. She talked about measures that would be taken in the EFH Amendment EIS process. May be opportunities beyond June to add to this amendment. She encouraged folks to come to the Habitat Committee meetings. The Plan Development Team's (PDT) perspective keeps lots of options and ideas on the table. PDT is exploring this area and will do additional analysis. Individual comments that come at committee meetings, anytime the committee makes a motion, the audience can speak. Long explanation about how NEFMC process and PDT will proceed with lots of options on the table. Anyone's individual comments will be listened to by the Committee.

Rob Moir: SAC and staff worked really hard together. Kudos to everyone. Is there something there?

Craig MacDonald read from SAC Charter about the administrative process on how a letter from the SAC has to be approved by SAC Chair and Sanctuary Superintendent.

Back and forth discussion on how to get the letter to NEFMC.

John Williamson. SAC is committed to mitigating any economic impacts to the fishing community. We need to communicate this individually to Council members.

Rich Delaney: As individuals, can participate in varying degrees in the fish management council process. Bigger political scale, as individuals communicating to the Secretary of Commerce or do this through constituencies. Get involved at Feb 23 meeting.

Back and forth about how to proceed with letter to Council. Following motion proposed and passed.

Motion: That SAC authorize the Chair to write a letter to the Superintendent reminding him that a lot of work went into the development of the SERA, that the SAC is following the advice to work with NEFMC, and as a body voted at the last SAC meeting to endorse the SERA and ask Secretary of Department of Commerce to release the report to the NEFMC. Deborah motions, Robert Rocha seconds.

VI. Working Luncheon – “Do Lobsters Make Decisions that Effect their Population?” OR “Lobsters: Dumb Human or Sophisticated Robots” (Dr. Jelle Atema). Dr. Atema, former Director of the Boston University Marine Program, has studied the behavior of lobsters, reef fish, and sharks for the past 15 years. His presentation focused on the different lobster populations, their behavior, habits, and habitat, from Rhode Island and the Gulf of Maine.

VII. Partner and Constituent Reports.

i. New Bedford Whaling Museum (Robert Rocha). Bob Rocha talked about numerous upcoming lectures, presentations, and exhibits, and learning programs that are taking place at the New Bedford Whaling Museum. The museum now includes exhibits on conservation and science in general. For more information, please visit the New Bedford Whaling Museum website: <http://www.whalingmuseum.org>.

ii. NOAA Fisheries Regional Report (Jen Anderson). Jen Anderson presented the NMFS report and provided the following summary:

Atlantic Sturgeon Endangered Species Listing

On January 31, 2012, NOAA announced that five populations of Atlantic sturgeon along the U.S. East Coast will receive protection under the Federal Endangered Species Act (ESA). The listings become effective on April 6, 2012. The Gulf of Maine population of Atlantic sturgeon has been listed as threatened while the New York Bight, Chesapeake Bay, Carolina, and South Atlantic populations have been listed as endangered. Atlantic sturgeon from the five populations mix in coastal waters which means that an Atlantic sturgeon listed as threatened can occur alongside an Atlantic sturgeon that is listed as endangered. We do not expect federally managed fisheries to be closed as a result of listing these five populations of Atlantic sturgeon. NOAA Fisheries Service has already been working with the industry to develop methods to reduce Atlantic sturgeon bycatch and bycatch mortality. We will continue to work with Fishery Management Councils, ASMFC, state agencies and stakeholders under several provisions of the ESA to evaluate the best options for minimizing impacts to Atlantic sturgeon without unduly hampering fishing activities. Addressing bycatch is one step toward the recovery of Atlantic sturgeon. We continue to support research that provides vital information for recovery, and we are working closely with Canadian authorities to understand the impacts of activities in those

waters for Atlantic sturgeon that are spawned in U.S. rivers. NOAA Fisheries Service is also working to address the other threats to Atlantic sturgeon, including water quality, vessel strikes, and impacts to habitat. Further information on these topics is available on the Northeast Regional Office, Atlantic Sturgeon webpage at: www.nero.noaa.gov/prot_res/atlsturgeon/.

Cape Code Common Dolphin Mass Stranding (Numbers as of 2/13/12)

The stranding response implemented by NOAA Fisheries Service's Marine Mammal Stranding Health and Response Network:

Total common dolphins that have stranded and received field numbers: 166

- 106 found dead
- 60 found alive
 - Of the 60 that stranded alive:
 - 46 were released (43 successfully)
 - 14 died or were euthanized (these are NOT included in the dead total above.)
 - Of the 46 that were released:
 - 3 subsequently re-stranded dead (one with a sat tag), these are not in the dead total, see note above.

Herding:

- 2/11/12 - 5 animals were successfully herded with pingers and boat deterrents
- 2/9/12 - 50 animals were successfully herded with pingers
- 2/8/12 - 3 animals herded (twice)
- 2/3/12 - harbor master herded ~7 animals out of Blackfish Creek
- 2/1/12 - six animals herded and all stranded
- 1/23/12 - 1 herded with pingers initially and then metal rods out of Rock Harbor (dolphin later stranded on a sand bar outside of the harbor)

Atlantic Large Whale Take Reduction Team Meeting January 9-13, 2012

NMFS conducted a meeting of the ALWTRT Jan. 9-13, 2012 in Providence, RI. NMFS is developing a rule to address the entanglement risk to large whales from vertical lines in commercial fishing gear. The meeting focused on discussion of vertical line risk reduction proposals put forward by stakeholders and members of the TRT. The proposals included many ideas including: increasing trawl lengths, exemptions for state waters, exemptions due to proposed trap reductions, closures, and increased gear marking. The proposals will be analyzed for their conservation benefit and used to shape NMFS' alternatives for the DEIS.

Gulf of Maine (GOM) Cod Update

- The 2011 GOM cod assessment found that the stock is overfished and overfishing is occurring.
- The stock was to be rebuilt by 2014 but the new assessment indicates that is no longer possible.
- The New England Fishery Management Council (Council) has two years to revise the GOM cod rebuilding plan but overfishing must be ended by 2013.
- The Council has requested that NMFS take interim action in 2012 to reduce overfishing and NMFS is considering the Council's request.
- The Northeast Fisheries Science Center is in the process of updating the GOM cod stock

assessment.

iii. NEFMC Report (Michelle Bachman). Michelle presented the NEFMC report and provided the following summary:

New England Fishery Management Council staff provided input during the discussion of the SERA proposal. Council members have received copies of the proposal, but have not discussed it during recent Council or Habitat Committee meetings. The Council's Habitat Plan Development Team and Committee are currently developing measures to minimize the adverse effects of fishing on habitat. These measures include possible revisions to the existing habitat closures, as well as new habitat management areas and dedicated habitat research areas (DHRAs). While the management options and areas are substantially developed, the PDT is just now developing detailed proposals for DHRAs. Options for habitat management areas will be packaged with options to modify the groundfish closed areas and forwarded to the Council for their consideration later this year, during their June meeting at the earliest. DHRAs will also be considered by the Council at that time. Additional analyses will occur after the Council approves the management and research area alternatives for further consideration in the Amendment. Once an Environmental Impact Statement is completed, the Council will approve the measures for public hearings. Final Council decisions on Omnibus EFH Amendment measures are scheduled for 2013.

During constituent reports, New England Fishery Management Council staff provided an update on recent activities. A major issue facing the Council is the updated Gulf of Maine cod assessment its potential effects on annual catch limits for 2013 and beyond. NOAA Fisheries is drafting an interim action that will include a catch limit for 2013 and associated management measures. At its January meeting, the Council recommended a range of catch limits and measures for their consideration. Other groundfish management actions currently under development include Amendment 18, which just finished initial scoping and will consider possible accumulation limits and consolidation issues, a framework action to update the sector management system, catch limit specifications for the 2012 fishing year, and possible revisions to the groundfish closed areas, including the Western Gulf of Maine closed area, as a component of the Essential Fish Habitat Omnibus Amendment. Also in January, the Council approved Multispecies Amendment 19 for public hearings. This action will implement annual catch limits and accountability measures in the small mesh multispecies fishery for red, silver, and white hake. This spring, the Council plans to finalize Amendment 5 to the Herring Fishery Management Plan. Public hearings will be conducted in March and final action is expected in June.

VIII. New SAC Issues.

John Williamson. The development of the regional planning body of the National Ocean Policy is moving ahead now. The question is how the sanctuary will figure into the planning. Susan Farady added that everyone is waiting for guidance from the NOC and governance committee. Rich Delaney said it is his understanding that it has somewhat stalled at the national level, but the regional council has been forging ahead anyway.

IX. New Business.

i. Continuation of Discussion - Draft SERA Proposal (*please see section V. SERA Update*).

ii. Rob Moir reported on the film, *Ocean Frontiers – The Dawn of a New Era in Ocean Stewardship* by Green Fire Productions. Rob urges everyone to watch the film. Anne Smrcina added that the New England Premier of *Ocean Frontiers* at the New England Aquarium IMAX theater will be on April 3rd. This is one of the one of the 20th anniversary events with a panel discussion that will follow the film.

X. Public Comment. No public comment.

XII. Adjournment. 2:30 pm.

SBNMS PROGRAMMATIC BRIEFINGS: FALL 2011

EDUCATION AND OUTREACH: Anne Smrcina

* PUBLICATIONS

Due to a reduced budget, we are unable to support the design contract, nor do we have sufficient funds to continue to print *Stellwagen Banknotes* and *Stellwagen Soundings* (however, the 2011 *Soundings* was written with the intention of having a two-year life; about 30,000 copies are available for distribution this year). The sanctuary is presently exploring the possibilities of on-line communications, including e-mail and web-based newsletters.

Sufficient funds were placed in the Government Printing Office to allow for a reprinting of the sanctuary map/poster, which has become a favorite sanctuary outreach product. The sanctuary is working with headquarters to see about revising the poster to incorporate new national design standards. The new posters will be available for spring distribution.

Fact sheets are being produced to cover a variety of topics across sanctuary program areas, including sister sanctuaries, volunteers, education and research. These fact sheets use templates developed at ONMS HQ and use the national design standards in Word.

* MEDIA

An article was prepared for Bird Observer Magazine about the Christmas Bird Count at Stellwagen Bank and the new survey area (following survey tracks from earlier studies). This article will appear in the February issue along with data from the 2011 count.

Sanctuary outreach programs and notices about staff talks have been picked up by a variety of media, including Patriot Ledger (Water Works lecture), Cape Cod Times (Harwich Lecture Series), Marine Art Contest (North Shore Kid web publication, Scituate Mariner), A Child's Sanctuary program at Scituate Library (Scituate Mariner and a national library web newsletter).

* EXHIBITS

Provincetown Kiosk on MacMillan Wharf

Funding has been allocated to this project and a new free-standing kiosk is being designed for MacMillan Wharf in Provincetown. Information on the kiosk will include the sanctuary map, sanctuary whale research, important species, and fish/fishing. The kiosk will replace the unit originally installed in 1995 (and moved several times). Its present location is situated near the ramps to the whale watching boats and between the Dolphin Fleet Center for Coastal Studies booths along the wharf walkway. Passengers from the ferries pass right by the kiosk on their way into the downtown area. We are working with the Harbormaster/Wharf Manager to have the unit installed in time for the 2012 whale watching season.

Cape Cod Museum of Natural History

We are working with the museum to develop a temporary exhibit (June 1-Dec 31) entitled "Animals without Passports," which will look at humpback whales (with specific reference to migration, feeding grounds, calving/breeding grounds, and threats). Elements of this exhibit may become part of a larger traveling exhibit to be developed in the future. The exhibit will provide information about our sister sanctuaries in the Caribbean, and recent research here at Stellwagen Bank. The National Marine Sanctuary Foundation has developed a contract with Lyons/Zaremba, a design firm in Boston to prepare the graphics and other exhibit elements. In addition to humpbacks, other sanctuary species with long-distance migrations will be part of the exhibit. The schedule calls for a June 1 opening.

Signage at Cape Cod National Seashore

The national signage program will assist us in the development of new signs for various locations at the Cape Cod National Seashore, including the deck overlooking sanctuary waters at the Province Lands Visitor Center. Schedule for this project is still to be determined. Headquarters has agreed to allow their graphic designer to help with this project (as well as perfect the joint signage look for ONMS/NPS signs).

NEOSEC Grant to Seacoast Science Center/NERACOOS/SBNMS

A NEOSEC (NE Ocean Science Education Collaborative) mini-grant has been awarded to NERACOOS for the development of an exhibit at the Seacoast Science Center in Portsmouth, NH focusing on sanctuary research (particularly right whales and acoustic monitoring). The intention of the mini-grant program is to bring on-going scientific research to the public. The science center will develop educational units to be used by visitors and school groups to supplement the exhibit.

Hollings Grant for Audio Cell Phone Tour and Smartphone Website

We are continuing work on this project, including securing locations for signs and recording messages. The mobile website is in development and will contain a wealth of visual resources to complement the audio messages. Tour stops will range from as far north as the Seacoast Science Center in Portsmouth to Woods Hole and Provincetown. The beauty of the program is that it is extremely flexible, and new stops can be added to the tour at any time. We are planning on having the program functional this spring and widely publicized this summer.

Traveling Student Art Show

Winning art from the 2011 Marine Art Contest is now part of a traveling show that made its debut at the PCCS Lab this summer. The show was installed at the New Bedford Oceanarium in Dec and was moved to the JFK Federal Building in Boston's Government Center in January (where it will stay until the end of Feb). The show will move to the Cape Cod National Seashore Eastham Visitor Center for the month of March and will then go to the Salem National Historic Site Visitor Center in April. In May, it will finish up its run at the NOAA Fisheries NE Regional Offices. The theme of the annual art contest is "Amazing Ocean Creatures of Stellwagen Bank National Marine Sanctuary" with winning art depicting a range of species, from humpback whales to horseshoe crabs. Thousands of individuals are able to view this fantastic student art and appreciate the range of species in the sanctuary via this annual exhibit. Winning artwork from the 2012 contest will begin touring in July. If you have suggestions for future exhibit locations, please contact Anne Smrcina.

* EDUCATION

Student Marine Art Contest with MME

The 2012 Marine Art Contest is now underway. The contest is sponsored by the Massachusetts Marine Educators and co-sponsored by the sanctuary, NE Aquarium, Provincetown Center for Coastal Studies, Whale and Dolphin Conservation Society and Stellwagen Alive. Anne Smrcina, sanctuary education coordinator and a member of the board of directors for MME is the contest coordinator. The annual theme is: "Amazing Ocean Creatures of Stellwagen Bank National Marine Sanctuary" (there is an optional alternative theme this year: 1992-2012 SBNMS: Celebrating 20 Years). There were almost 750 entries for the 2011 contest, and it is expected that there will be many more in 2012. Deadline for the contest is April 26, 2012. Emails have gone out to many individual teachers, schools, art education associations and environmental organizations promoting the contest, along with visits to key art education groups. SAC assistance in spreading the word would be appreciated.

MCC Marine Careers Mini-Course

This was the third year that the sanctuary sponsored a marine careers mini-course (four evening talks) with Massasoit Community College. Sanctuary and other NOAA staff gave programs on GIS and data analysis, diving and underwater photography, science writing, and marine law enforcement. We are

looking into ways to better promote this program to local high schools and interested members of the general public.

MCC Undergraduate Course on Sanctuary Resources

The sanctuary is working with Massasoit Community College to develop a three-credit undergraduate general science course that focuses on sanctuary resources. The course provides an introduction to a wide range of sciences, including meteorology, physical oceanography, geology, ornithology, ichthyology, marine mammalogy, invertebrate zoology, ecology and marine technology. The course will include a number of guest lectures by local specialists, including staff from NOAA Fisheries, USGS, National Weather Service, MA DMF, and the sanctuary. The course, originally scheduled for this spring, will now be offered in the fall semester. We are planning on developing an on-line version of the course, based on materials presented in this live (fall 2012) program, making it possible to offer the course on a regular basis without the need for re-booking all of the speakers.

Science and Education Symposium with MME/BHEC

The fall 2012 (Sept 29) Boston Harbor Educators Conference is dedicated to the 20th anniversary of the sanctuary. The intention is to have this serve as an education and science symposium, in which a wide range of sanctuary science can be presented to an audience of teachers and researchers. Workshops during the program will focus on ways of bringing sanctuary data into the classroom. We will offer opportunities for researchers to network with their peers and for teachers to talk to scientists directly about their research. Planning for this conference is now underway.

Participation in HSMSS

The sanctuary will contribute to the annual Massachusetts Marine Educators High School Marine Science Symposium (March) by offering one of the keynote talks (Mike Thompson) and providing one of the student workshop sessions (Anne Smrcina).

EXTERNAL AFFAIRS: Nathalie Ward

*** SANCTUARY ADVISORY COUNCIL (SAC)**

The Council's participation in the SAC CHALLENGE—20th Anniversary Celebration of SBNMS—will be launched at the end of January 2012. SAC Members have been planning events, various publication, education programs or research/technology forums to raise visibility of the sanctuary and the mark its 20th year anniversary. Note: Anniversary Calendar emailed to SAC SAC events highlighted in yellow.

Currently the following four seats are vacant (2) Research seats (alternate); (1) At Large seat (member); and, (1) non-voting Youth member and alternate seat. Standing SAC Subcommittees include: SAC Leadership Award Subcommittee, Youth Seat Subcommittee and Ad Hoc SERA Subcommittee. The Youth seat was added to the Charter from a motion of the SAC. The recruitment will be announced in February.

Nathalie Ward, SAC Coordinator, continues serving on national ONMS Executive Committees: National Coordinator's Executive Committee (CEC) for a 3-year term to set priorities and improve crosscut Council's communication.

*** SISTER SANCTUARY PROGRAM**

Second International Conference on Marine Mammal Protected Areas (ICMMPA2)

Some 150 marine mammal protected area (MMPA) researchers and managers as well as government and conservation group representatives from 42 countries and overseas territories convened in Martinique in the French Caribbean from 7-11 November 2011 for the Second International Conference on Marine

Mammal Protected Areas (ICMMPA2). The goal of the conference was to seek solutions to shared problems related to marine mammal conservation and to MMPA site and network design, creation and management. A secondary goal was to orient those working in MMPAs to set those protected areas in the broader context of marine management, in order to ensure that MMPAs are not marginalized as marine spatial planning work advances. Unlike most scientific meetings, the ICMMPA stresses workshops, panels, and open forum discussions to emphasize collaboration, communication and networking among MMPA practitioners.

The conference was co-hosted by the French MPA Agency (Agence des aires marines protégées) and the US National Oceanic and Atmospheric Administration (NOAA). Fifteen other international and regional sponsors, as well as a dozen supporting organizations, were actively involved, most either based or with representation in the Caribbean.

The conference theme of “Endangered Spaces, Endangered Species” was explored in keynote talks, panels and workshops, with a view to discussing actions which impact negatively, gaps lessons learnt and to develop scenarios, contingency and precautionary approaches. The venue was also used as an opportunity to inform stakeholders, marine mammal scientists and the wider public about Caribbean’s environmental and marine conservation efforts and to promote the Agoa sanctuary for marine mammals in the French West Indies.

Plenary sessions were divided into panels, followed by discussions, focusing on: (1) special considerations for particularly endangered marine mammals and whether MPAs are the right tool; (2) refining our understanding of marine mammal critical habitat and hotspots to inform MMPA designation; (3) using marine spatial planning and ecosystem-based management to address broad threats to marine mammals; (4) managing MMPAs for localized threats and mitigation by spatial protection and other means; (5) development of MMPAs in the wider Caribbean region; and, (6) regional cooperation for MMPA scientific and technical networking.

The workshops focused on marine mammals and oil spills, decision-making with limited data, best practices for whale watching in MMPAs, integrating marine mammal data in marine spatial planning, forging agreements to establish effective MMPA networks, and the widespread mortality attributed to fisheries bycatch.

Nathalie co-chaired a workshop on: “Bilateral and Multilateral Agreements to Facilitate Partnerships between and among MMPAs: Making Them Work and Lessons Learned”, Her presentation—“Beyond borders — sister sanctuaries: An innovative management approach for transboundary marine mammal species in the Wider Caribbean Region»—and subsequent discussions evoked the following key recommendation, predicated on SBNMS’ Sister Sanctuary Program:

- That the ICMMPA endorse and support the use of multilateral and bilateral agreements for the purpose of creating MMPA networks and partnerships.
- That the ICMMPA endorse and support “sister MMPA” partnerships established through such agreements.
- That the ICMMPA coordinate the development of a document providing guidance for the MMPA Community that offers essential underlying principles for effective development of bilateral and multilateral agreements, outlines appropriate legal mechanisms, “best practices” for development and implementation of agreements, and illustrative case studies. One such case study will be on SBNMS and its sister sanctuaries.

ICMMPA 2 was hosted in the Caribbean to afford synergies and networking opportunities for the Wider Caribbean, including sessions on the eastern tropical Pacific, northeast South America, as well as on the nine river dolphin countries of South America. *Key recommendations and conclusions* that emerged from the conference workshops were as follows (from global and regional levels to the taxa-specific level). Please note that the full set of recommendations is available in the proceedings; [www: http://second.icmmpa.org/](http://second.icmmpa.org/)

The location of the conference in the Caribbean celebrated the French declaration of the Agoa Marine Mammal Sanctuary, itself one of the conference sponsors. Dr. Craig MacDonald gave the keynote closing speech, which outlined SBNMS's pioneering marine mammal research as well as our education/policy MMPA efforts. The ICMMPA conferences will continue with a proposed conference for Australia in late 2013 or 2014.

Abstract: "Beyond Borders—Sister Sanctuaries: An Innovative Management Approach for Transboundary Marine Mammal Species in the Wider Caribbean Region"

The Sister Sanctuary relationship, established in 2006, between Stellwagen Bank National Marine Sanctuary (SBNMS) and Santuario de Mamíferos Marinos de la República Dominicana (SMMRD) marked a new chapter for the *joint* management of the endangered humpback whale (*Megaptera novaeangliae*) in the North Atlantic. The sister sanctuary was the *first* international accord to protect an endangered marine mammal migratory species on both ends of its range—in its northern feeding and nursery grounds in SBNMS and its southern mating and calving grounds in SMMRD. In 2011, SBNMS signed a sister sanctuary agreement with the French Antilles Agoa Marine Mammal Sanctuary, expanding the sister sanctuary programme, which 1) facilitates an ecosystem-based approach to cooperative sanctuary management of humpback whales through capacity building, research, monitoring and education; 2) serves as a template to elevate national and international awareness of the importance of the ecological connection between these marine mammal protected areas; and, 3) emphasizes the critical need to take a broader management view toward transboundary conservation of marine mammal species. The sister sanctuary concept is part of a larger international and global vision of Marine Mammal Protected Areas (i.e. UNEP's Specially Protected Areas and Wildlife Protocol for the Wider Caribbean Region) that prioritizes management regimes that maintain ecological connections between marine protected areas in order to satisfy species' requirements. The sister sanctuary model promotes a strategy that defines emerging problems (beyond EEZ's), kindles commitment to critical habitats, and manifests the true spirit of regional cooperation, which is a key element to ensure effective management for biodiversity protection and the conservation of migratory, marine mammal species.

Sister Sanctuary Status:

The Sister Sanctuary Program (SSP) can clearly play a powerful role in protecting endangered humpback whales (transboundary species), preserving special marine areas, increasing public awareness and support for marine mammal conservation, and providing sites for research and monitoring. The current SSP status is outlined below:

Dominican Republic: SBNMS's Sister Sanctuary (SS) MOU with Santuario de Mamíferos Marinos de la República Dominicana (SMMRD—Marine Mammal Sanctuary of the Dominican Republic)—first signed in 2006, *was renewed by MOU amendment to extend for 2012-2017.*

Bermuda: SS Letter of Intent (LOI) signed with Bermuda for the development of future sister sanctuary partnership for SBNMS/GoM humpback whales migration corridor.

French Antilles: The sister sanctuary MOU was signed July 2011. The MOU(s) delineates the general terms, objectives and responsibilities of the sister sanctuary (SS) relationship, which aims to enhance an ecosystem-based approach to cooperative sanctuary management through capacity building, research,

monitoring, and education.

Dutch Antilles: Nathalie is working with the Dutch Antilles Windward Islands to establish a humpback whale sister sanctuary in waters of the Kingdom of the Netherlands including Saba, St. Eustacius and St. Maarten. The SS MOU is scheduled for signature in 2012.

Nathalie is a contributor to the ONMS International Program's bimonthly conference calls to discuss relevant international topics such as capacity building and partnerships, establishment of new MPAs, sister sanctuaries, and World Heritage sites and ONMS assistance with management plan for newly established marine mammal sister sanctuaries.

United Nations Environment Programme's LifeWEB Project

Working as advisor for UNEP/LifeWEB project, Nathalie is assisting the Dominican Republic government and NGO's re: the development of a Management Plan for the Santuario de Mamíferos Marinos de la República Dominicana (SMMRD—Marine Mammal Sanctuary of the Dominican Republic). Four Workshops have been planned in the D.R., three of which were held 9/21/2011; 10/18/2011; 11/29/2011; and, the last to be held on 1/29/2011.

The LifeWEB project's goal is to assist in *broad-scale marine spatial planning of marine mammal corridors and protected areas in Wider Caribbean Region*. This activity was chosen by LifeWEB as a practical demonstration project to build management capacity while increasing national, regional and international coordination, which could provide a high quality, short-term deliverable. SBNMS will be in the forefront of the planning and implementing stages of this project and determining what contribution we can make relative to the longer-term projects, most likely in the development of sister sanctuary relationships, MPA capacity building, and marine spatial planning. We have offered the SBNMS Final Management Plan as an example of marine protected area management that sets conservation of biodiversity as a priority goal.

Participation in the LifeWEB Programme will help to establish new and enhance existing marine mammal protected areas and Marine Protected Areas (MPA) networks that will "sister" with SBNMS to protect the endangered humpback whale throughout its migratory range. The sister sanctuary relationship between SBNMS and SMMRD (est. 2006) has been highlighted as a model for transboundary species protection. Regional partners for the project include UNEP's Caribbean Environment Programme's Regional Coordinating Unit in Jamaica, UNEP's Specially Protected Areas and Wildlife (SPAW) Programme's Regional Activity Center in Guadeloupe, the Dominican Republic's Ministry for the Environment and Natural Resources and D.R. non-governmental organizations {i.e., partners include the Ministry of Environment and Natural Resources (i.e., The Nature Conservancy (TNC), Fundación Dominicana de Estudios Marinos, Inc. (FUNDEMAR), Universidad Autónoma de Santo Domingo (UASD), Universidad Autónoma de Santo Domingo, Autonomous University of Santo Domingo (UASD), Centro para la Conservación y Ecodesarrollo de la Bahía de Samana y su Entorno (CEBSE)}.

Eastern Caribbean: The Grenadine Project UNEP-Specially Protected Areas and Wildlife (SPAW) Regional Activities Center (RAC)

The southernmost range of SBNMS/Gulf of Maine humpback whales' includes all the islands of the Eastern Caribbean (EC) region including Dominica, St. Lucia, St. Vincent, Barbados, Grenada and Trinidad & Tobago. In order to expand our sphere of influence to protect humpback whales. In this context, a site visit to the SMMRD in the Dominican Republic, consisting of a delegation from selected Eastern Caribbean countries, is planned. The visit would give participants the opportunity to benefit from lessons learned with the management of the SMMRD for whales and other marine mammal species with

respect to broad-scale marine spatial planning, as well as highlighting the economic opportunities associated with such management, and discussion as to possible ways of strengthening large-scale management and planning for marine mammals. This project is funded by UNEP-Nairobi and administered by UNEP's -SPAW-RAC in Guadeloupe.

Additionally, Craig MacDonald and Nathalie will attend the Seminar on Whale Sanctuary Field Operations in Santo Domingo, Dominican Republic from March 27-30 (funded by The Nature Conservancy).

AMIGOS' International Exchange Program

Since 2007, SBNMS has partnered with the Provincetown Center for Coastal Studies (PCCS) and the Dolphin Fleet Whale Watch Company to provide specialized summer training in education and scientific research for Caribbean interns. In the 2011 summer season, the two interns were from the Dominican Republic and Puerto Rico. We are currently recruiting for Caribbean interns for summer season 2012. Participants enhance their knowledge of marine policy, research skills and marine conservation practices; broadened their knowledge of local natural history; strengthen their understanding of scientific concepts and methods; and developed outreach and education materials. The current manager for SMMRD, Peter Sanchez, was a former Amigos' intern in 2007.

* EXHIBITS—"ANIMALS WITHOUT PASSPORTS"

We are working with the Cape Cod Museum of Natural History to develop a temporary exhibit (June 1-Dec 31 2012-2013) entitled "Animals without Passports," which will look at humpback whales and (with specific reference to migration, feeding grounds, calving/breeding grounds, and threats), and provide information about our sister sanctuaries in the Caribbean, and recent SBNMS research. Elements of this exhibit may become part of a larger traveling exhibit to be developed in the future. Additionally, this exhibit complements the recently completed (2011) sister sanctuary exhibit at the Whale Museum of Samana, D.R. Future partnerships for sister sanctuary exhibits and exchange programs are being explored and developed with the Natural History Museum of the Dominican Republic and Cape Cod Museum of Natural History, Brewster, MA

* WHALE SENSE—WHALEWATCHING

The Sanctuary continues as a partner with Whale SENSE, a voluntary education and public awareness program promoting responsible whale watching and marine stewardship through a voluntary code of conduct adhered to by the whale watch tour operators and naturalists. The initiative is a partnership between NOAA Fisheries and local NGO, the Whale and Dolphin Conservation Society, and SBNMS. The program's goal is to work with companies to maintain a high standard of training for whale watching operators and their naturalists to maximize the educational value of these tour operations and to increase public awareness of whale conservation, science and management. In Year II (2011), SBNMS developed fact sheets on topical areas to highlight sanctuary-related issues for naturalist/operator trainings and assisted with the development of refining the Whale SENSE framework. Companies that are Whale SENSE members in New England include: Dolphin Fleet (Provincetown, MA), Provincetown WhaleWatch (Provincetown, MA) Captain John and Son Whalewatch (Plymouth, MA), Hyannis Whalewatch (Barnstable, MA), Yankee Fleet (Gloucester, MA). Participating companies also take part in a conservation stewardship program approved by WhaleSENSE. Currently, we are preparing for the 2012 whale watch season.

* STELLWAGEN ALIVE!—FRIENDS OF SBNMS

In July, following turnover on the Board of Directors for Stellwagen Alive, the remaining Board members

have embarked on re-evaluation of the organization and its mission in support of the SBNMS program. John Williamson is now serving as president and Les Kaufman is serving as vice-president. Following her resignation as Executive Director, Jennifer Ferre Bender was asked to serve in a new role as manager of "Fathom That!" working in partnership with Anne Smrcina on an Audio Cell Phone Tour and Smartphone interactive network of some thirty sites around Massachusetts Bay. This project is funded through a Hollings Grant award. Additionally, Stellwagen Alive is placing renewed emphasis on social networking as a tool for building public awareness of SBNMS, and has engaged interns from the Boston University Marine Program to manage its Facebook web presence. Our goal: 1000 new Facebook friends by June. Friend us on Facebook!

* PUBLICATIONS

"Whales in the Balance: To Touch or To Kill? A View of Caribbean Attitudes Towards Whales" in *Whales and Dolphins: Cognition, Culture, Conservation and Human Perceptions*. N. Ward. Eds P. Brakes and M. Simmonds. Earthscan, London, 2011.

Marine mammal biologist Nathalie Ward presented on "science writing" during the annual Massasoit Community College Marine Careers lecture series.

VOLUNTEER PROGRAM: Anne-Marie Runfola

* NUMBERS AT A GLANCE

- 55 active volunteers have logged 4,000 hours since November 2010. This translates to an estimated monetary value of \$131,872 in services donated to the sanctuary. (Estimate uses MA State rate for unskilled volunteer service @ \$22.46/hr and an average skilled rate of \$75/hr. Conservative estimate of 1/5th volunteer services at skilled rate.)
- Partnered with 20 organizations through volunteer program activities in 2011. Developed four new partnerships for the program this fall: National Audubon (Seabird Stewards), Mass Maritime Academy (Operations Internships), Gates Intermediate School (Ambassadors), Scituate Maritime and Irish Mossing Museum (Ambassadors).

Developed volunteer opportunities and filled positions in two new areas this fall: Operations/Facilities and GIS/Data.

STELLWAGEN SANCTUARY SEABIRD STEWARDS (S4)

Stellwagen Sanctuary Seabird Stewards (S4) successfully completed their pilot research season with the Christmas Bird Count on December 30th, 2011. Held in partnership with National Audubon, nine expert birders from National Audubon and the S4 program ventured out with staff on a near perfect day, sighting 2,043 birds in the sanctuary. Among the many highlights were the totals for Northern Fulmar, Dovekie, and Common Murre, all of which represent all-time highs for the 24-year count; the puffins, and the Pomarine Jaeger, a species that is very rare in MA waters in late December. Perhaps most unusual and surprising was the ratio of dark and light morph fulmars. A polymorphic species, dark morphs are most typically found in the Atlantic population in the high Arctic at the northern-most reaches of the species' range, while those that occupy the southern portions of its range (and the birds we typically see at Stellwagen) are mostly light. Why this pattern was reversed among the birds we saw yesterday is a mystery.

In total, 25 stewards collected data on five cruises on the R/V *Auk* and on two whale watch trips from August through December 2011, documenting a total of 9,385 birds of approximately 30 species. In 2012,

we plan to run at least five cruises on the *Auk* and deploy stewards weekly on whale watch vessels to build our baseline database of birds in the sanctuary.

Anne-Marie will present the S4 program at several venues including the Water Watch Lecture Series on January 25th, the Mass Audubon Birders Meeting on March 3rd, and the Maritime Gloucester April 5th lecture, with Wayne Petersen. Anne-Marie and several other staff members, including Research Coordinator, David Wiley, will participate in the Marine Bird Cooperative Meeting on Feb. 28th/29th with US Fish and Wildlife, BOEME, and other agencies to coordinate seabird research and identify funding opportunities.

* AMBASSADOR PROGRAM—Cross-Training Volunteers From Partner Organizations

One Sanctuary Ambassador initiative is to cross-train volunteers in institutions that house Stellwagen exhibits. The goals are to strengthen connections with these organizations, share resources, encourage the dissemination of key sanctuary messages, and use volunteers to make the exhibits as interactive and engaging as possible. First on the agenda was the Scituate Maritime and Irish Mossing Museum. On November 15th, 2011, Anne-Marie Runfola and Matthew Lawrence, SBNMS Maritime Archaeologist, held a workshop on the topic of the SS *Portland* for 10 museum volunteers, including the Director of the Scituate Historical Society. The training prepared museum docents to share more Portland stories with visitors and also to help run an event on December 3rd with SBNMS to commemorate the sinking of the *Portland*. In addition to more exposure for the sanctuary, the events had a further benefit; they prompted the museum director to share information about the Portland that our Maritime Archaeology staff had not yet seen.

* A CHILD'S SANCTUARY PROGRAM EXPANDS

100 parents and children participated in the November 12, 2011 *A Child's Sanctuary: Whales in our Backyard* event at the Scituate Town Library. Seven volunteers worked with Anne-Marie to produce the event, offering a variety of activities to the children while engaging parents in discussion about the sanctuary. On January 11th, 2012, 17 volunteers gathered to see video footage of shipwrecks and creatures found on the sanctuary floor and hear Matthew Lawrence narrate. The video, produced by Matt, will be shown at the January 28th, 2012 *A Child's Sanctuary: Bottom of the Sanctuary* event at the library—the fifth CS event hosted by the SBNMS and its volunteer Ambassadors. Activities will focus on exploration of shipwrecks and sanctuary animals that are not as well known as whales and seabirds and technologies used to research and document these resources.

Another goal of the Volunteer Program is to expand *Child's Sanctuary* events to communities from Cape Ann to Cape Cod. Two teachers and seven students from Gates Intermediate School in Scituate will be among the volunteers who run the Jan. 28th event. This will help them prepare to run their own Child's Sanctuary event for the full 7th and 8th grades at their school in February or March of this year. With this partnership, we now have models for both school and community events to use when expanding to other towns this year, starting with a large *Child's Sanctuary* event on July 21st, 2012 in Woods Hole. Part of the 20th Anniversary celebration, activities will be designed along the theme of the two-day event—*Stellwagen Revealed: What Is A Sanctuary?*

* SPRING VOLUNTEER PROGRAM EVENTS

- 1/25/12: Water Watch Lecture Series: *Sighting! Surveying Seabirds on Stellwagen Bank*, Anne-Marie Runfola, (<http://nsrwa.org/Event-77.html>).
- 1/28/12: *A Child's Sanctuary: Bottom of the Sanctuary*. Scituate Town Library.
- 2/28-2/29/12: Marine Bird Cooperative Meeting with US Fish and Wildlife, BOEME, and other agencies.
- 3/3/12: Seabird Stewards presentation at Mass Audubon Birders Meeting (<http://www.massaudubon.org/news/index.php?id=917&type=news>)

- 3/18/12: Scituate St. Patrick's Day Parade – march with us!
- Feb/Mar: *A Child's Sanctuary: Whales in our Backyard*. Gates Intermediate School.
- March: Sanctuary Seabird Stewards Workshop
- March/April: Sanctuary Ambassadors Workshop
- 4/5/12: Seabird Stew

MARITIME HERITAGE: Deborah Marx and Matthew Lawrence

SBNMS actively uses social media to connect with its constituents. In 2011, virtual visitors from across the United States and the world learned about the sanctuary and NOAA's ocean conservation efforts through visits to SBNMS Facebook and YouTube social media sites. SBNMS established its Facebook page (<http://www.facebook.com/SBNMS>) in April 2009. To date it has 660 "Friends" i.e. subscribers to the sanctuary's posts. New posts are added to the page at least once a week by Deborah Marx with content input from SBNMS staff. Staff have found Facebook to be an effective way to disseminate information in a timely and concise fashion. Unlike the SBNMS website, Facebook Friends receive notice when new content is added. SBNMS established its YouTube page (<http://www.youtube.com/user/SBNMS>) in May 2007. To date it has over 76,000 video views and 326 subscribers. The page contains 25 videos and the top viewed video is a wolfish with over 36,421 views. All video production is done in house by Matthew Lawrence and Deborah Marx. SBNMS has the most YouTube video views of the three sanctuary sites that currently have a YouTube page (the other two sites are Thunder Bay and Monterey Bay). In 2012, staff intends to increase subscriptions to SBNMS social media sites and increase the frequency of communication. We will also explore using other social media outlets such as Twitter and Flickr to expand our digital presence.

Stellwagen Bank sanctuary's maritime heritage interpretation has made a significant impact in local communities. In September, sanctuary archaeologists hosted "Deepsea Science: Wreck of the *Portland*", as part of the Essex National Heritage Area's annual Trails and Sails event. When comment cards were tallied, the program earned a "People's Choice Award" and was ranked the 3rd most popular program out of 190 Trails and Sails offerings.

Maritime heritage staff exhibited at Boston's Museum of Science Archaeology Fair hosted in partnership with the Archaeological Institute of America. The 2-day fair drew over one thousand school children on Friday, 7 October and around a thousand families on Saturday, 8 October. SAC member John Galluzzo joined the staff on Friday, providing information on the sanctuary's maritime heritage and helping to wrangle the students.

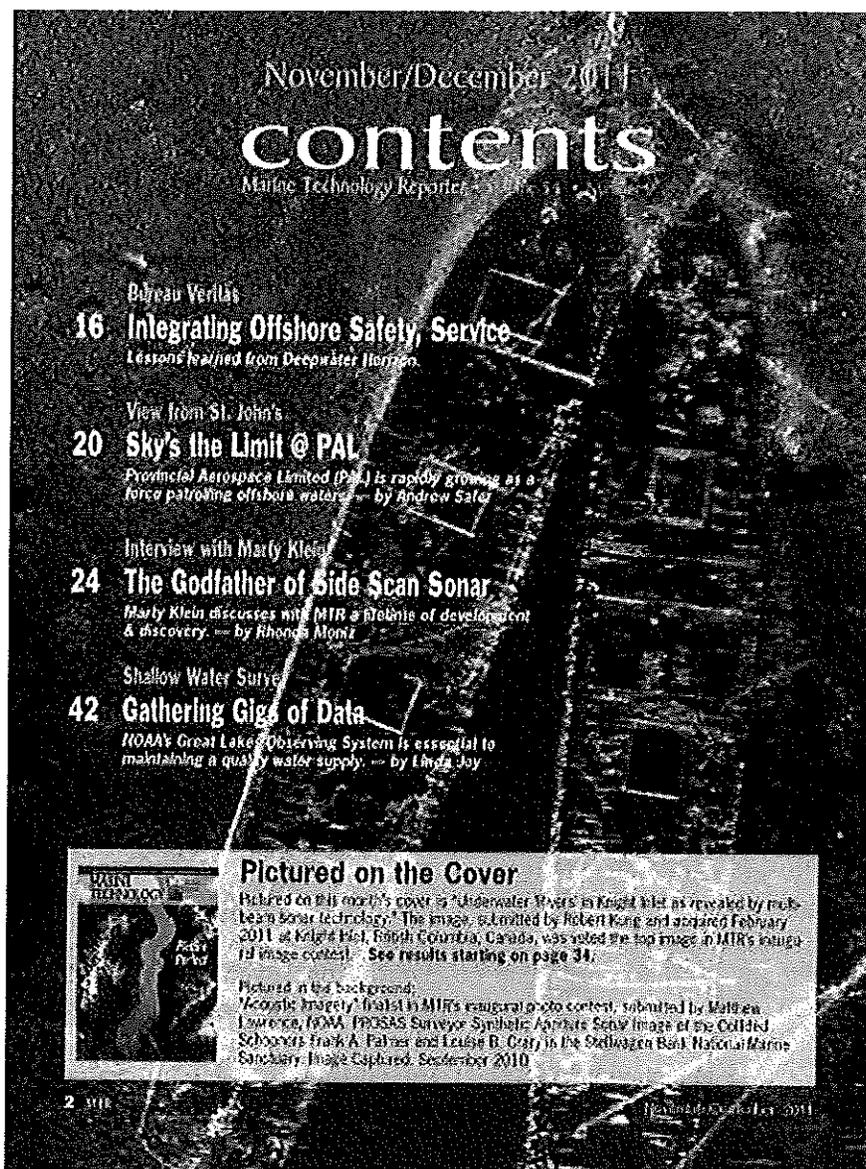
Maritime heritage staff and Anne-Marie Runfola, SBNMS's Volunteer Coordinator, conducted docent cross-training at the Scituate Historical Society's Irish Mossing and Maritime Museum. The museum exhibits information on the steamship *Portland* including sanctuary images and messaging. Staff gave a presentation to the museum's docents with updated information about the sanctuary's archaeological research on the *Portland*. Docents also received a packet of sanctuary information relating to the *Portland* including a DVD with underwater video of the site.

SBNMS archaeologists commemorated the anniversary of the loss of the steamship *Portland* with an event at Scituate's Irish Mossing and Maritime Museum co-hosted with the Scituate Historical Society. The interpretive program highlighted the sanctuary's archaeological and historical investigation of the steamship and the museum's collection of *Portland* artifacts. The event also included a showing of the Science Channel's award winning documentary, *The Wreck of the Portland*, and a presentation on current research. November 27th marked the 113th anniversary of the steamship *Portland*'s sinking during 1898. The *Portland* is known as the "Titanic of New England" because of the magnitude of its loss. None of the

over 190 passengers and crew survived the massive storm that wreaked havoc on New England's coast, a storm that was later dubbed "The *Portland Gale*" after this tragic event. The storm killed more than 400 persons and sank more than 150 vessels up and down the East Coast as well as changing the course of the North River in Scituate. The event was featured in the *Scituate Mariner* newspaper on 1 December 2011 and 50 persons attended the presentation.

Archaeologist Matthew Lawrence presented on underwater photography and videography during the annual Massasoit Community College Marine Careers lecture series.

Marine Technology Reporter selected a synthetic aperture sonar image of the collided schooners *Frank A. Palmer* and *Louise B. Crary* as a finalist for the magazine's first annual photo contest. The image was featured on the magazine's contents page in the November/December 2011 issue, which had a print run of approximately 20,000 copies.



RESEARCH: David Wiley, Leila Hatch, Michael Thompson and Brad Cabe

*** CHARACTERIZATION OF UNDERWATER NOISE IN THE SBNMS**

(Funded by award to L Hatch, S Van Parijs and C Clark from Exxon Mobil Corp via the National Fish and Wildlife Foundation 2010-2012)

As a continuation of previous three-year funding awarded to the same PIs under the National Oceanographic Partnership Program (NOPP), low frequency acoustic data was analyzed by researchers from SBNMS, NOAA's Northeast Fisheries Science Center and Cornell University's Bioacoustics Research Program during the summer and fall 2011. These data are being used to address multiple questions regarding the locations, behaviors, and potentials for communication masking among several vocally-active species in the sanctuary, including fin, humpback, right and minke whales. Large commercial ship tracking data were collected via the Automatic Identification System (AIS) and analyzed by the SBNMS, and vessel tracks collected from fishing and whale-watching vessels were used to describe the distribution and densities of these additional non-AIS tracked vessel types. Vessel tracking data were integrated with acoustic data to assess their noise contributions to sanctuary waters and used to inform models that quantify impacts of this noise to whales' communication capabilities.

Quantifying loss of communication space for right whales in and around a U. S. National Marine Sanctuary **L.T. Hatch**, C.W. Clark, S.M. Van Parijs, A.Frankel, and D. Ponirakis. In review by Conservation Biology.

Cumulative effects of multiple vessel classes on the communication space of baleen whales producing various sound types in different behavioral contexts. S.M. Van Parijs, C.W. Clark, D. Cholewiak, P. Dugan, **L.T. Hatch**, S. Mussoline, and D. Ponirakis, D. Risch, J. Stanistreet, and **M. Thompson**. 19th Biennial Conference on the Biology of Marine Mammals. November 28th-Dec 2nd 2011. Tampa, FL.

Vu, Elizabeth T., D. Risch, C. W. Clark, S. Gaylord, L.T. Hatch, M. A. Thompson, **D. N. Wiley**, and S. M. Van Parijs. (2012) Humpback whale song occurs extensively on feeding grounds in the western North Atlantic Ocean. *Aquatic Biology*: Vol. 14: 175-183.

*** NOAA CETACEAN AND UNDERWATER SOUND-FIELD MAPPING WORKING GROUPS**
(Co-chaired by L. Hatch, SBNMS and J. Harrison, NOAA Fisheries Office of Protected Resources)

In a January 19, 2010 letter to the Council on Environmental Quality, NOAA Administrator Dr. Jane Lubchenco committed to convening two workshops to develop a comprehensive noise budget for the oceans and model marine mammal distributions and densities. A strategic, structured approach was derived by an internal NOAA steering committee and discussed and coordinated with other involved federal agencies to implement these recommendations. This approach consists of establishing two small, product-driven working groups consisting of subject matter experts from within and outside NOAA: the Cetacean Density and Distribution Mapping Group, and the Underwater Sound-field Mapping Working Group. Both groups have approximately one year to develop geospatial tools to describe and visualize the distribution and density of cetaceans and noise from human sources within the U.S. Exclusive Economic Zone (EEZ). Subsequently, a larger, integrative forum will be held to discuss the management implications and application of these tools. L. Hatch has been co-chairing this overall effort and the Underwater Sound-field Working Group with ongoing analyses through the fall following their October meetings in Santa Cruz and presentation at the Society for Marine Mammalogy's Biennial meeting in Tampa, Florida (below). Data from SBNMS are playing important ground-truthing roles in the sound-field modeling effort as well as providing a high-resolution case study for the symposium integration.

The NOAA Underwater Sound Field Mapping Working Group: Developing Geospatial Tools to Inform Management of Cumulative Impacts on Marine Mammals. **L. Hatch**, B. Southall and 15 additional co-

authors. 19th Biennial Conference on the Biology of Marine Mammals. November 28th-Dec 2nd 2011. Tampa, FL

*** PASSIVE ACOUSTIC IDENTIFICATION AND CHARACTERIZATION OF COD SPAWNING ACTIVITIES**

(Funded by award to L Hatch and S Van Parijs via NOAA Fisheries Office of Science & Technology)

In spring 2011, a collaboration was initiated between Sanctuary, Northeast Fisheries Science Center, Cornell University and Massachusetts Division of Marine Fisheries scientists to develop a research program that would use Marine Autonomous Recording Units (MARUs) placed near predictable aggregation areas for spawning cod in Massachusetts Bay to identify and characterize the sound profiles of these events. Results of analysis documented proposed cod spawning sounds as well as their diurnal seasonal periodicity. These results, in conjunction with new information from DMF's ongoing cod tagging work, is being used to design an array of acoustic recorders that will be deployed in spring 2012 to further link cod movements in the area surrounding the cod spawning site with their acoustic behavior.

*** SANCTUARY/US COAST GUARD AUX WHALE WATCH DATA COLLECTION**

Coordinated the 2011 season of US Coast Guard Auxiliarists in the planning, training and collection of GPS vessel track data from whale watching trips across the sanctuary. This remote data collection requires daily communication with 12 US Coast Guard Auxiliarists who were collecting track and trip information and then delivering them to me nightly, over 100 emails this season so far, for QA/QC. The processing of these tracks and the observations is currently under way and will be standardized and loaded into our whale watching spatial database. These data are processed and analyzed to help better understand whale watch vessel use within the sanctuary and are being analyzed acoustically as well to better inform sanctuary management.

*** TAGGING OF HUMPBACK WHALES**

A team of government and university scientists peered into the depths of Stellwagen Bank National Marine Sanctuary in summer 2011 in an attempt to better understand whale behavior and the underwater world they inhabit. The primary tool they are used was the National Geographic Crittercam – a video camera that is attached to the whales with suction cups. Once the camera popped off and was retrieved, the recorded video footage showed the types of fish the whales are feeding on and gave clues to how the whales were catching their prey.

The Crittercam project evolved from earlier tagging studies using digital acoustic recording tags (DTags), that recorded whale depth, direction, pitch, roll and sounds created and received by whales. With data from the DTags, the sanctuary science team has begun to recognize particular humpback whale feeding patterns, including bottom feeding, single spiral bubble nets and double loops with lobtails. Although these previous studies provided data from which visualizations and animations showing movements could be developed, there was no actual video footage showing whale activity underwater in the sanctuary. With this project, the science team hopes to fill that gap.

In addition to the video camera tagging, additional studies used a towed sonar system to study prey fields (the extent and density of fish, primarily sand lance). An extra project involved the collection of humpback whale dung (also referred to as "poop"). From these leavings, scientists can learn about the diet and health of the whale. But the primary use of the dung samples is to continue studies on nitrogen cycling in the ocean. Scientists from the University of Vermont and Harvard University have theorized that whales serve as an important agent in the delivery of nitrogen from the seafloor to the surface, where it becomes a kind of fertilizer for primary production. In the natural cycling of ocean nutrients, nitrogen gets caught up in algae, which is eaten by zooplankton. Eventually this material sinks to the seafloor. Small fish, such as sand lance, consume the plankton and, in turn, are eaten by the whales. The whales

digest the food and excrete the dung into the photosynthetic surface waters, just as cows and elephants excrete dung onto grasslands.

The project team and partners included:

David Wiley, SBNMS, principal investigator
Ari Friedlaender, Duke University, chief scientist
Michael Thompson, SBNMS lead scientist and GIS analyst
National Geographic Society
NOAA Fisheries Service
Whale Center of New England
University of Vermont
Harvard University
University of New Hampshire
International Fund for Animal Welfare
National Park Service
Woods Hole Oceanographic Institution

The research cruise began July 6 and continued until July 13 using the sanctuary's Research Vessel Auk as the on-the-water base of operations. An inflatable vessel, the *Balaena*, from Woods Hole Oceanographic Institution was used to get researchers within tagging range of the whales.

Publications:

Wiley, David N., C. Ware, A. Bocconcelli, D. Cholewiak; A. Friedlaender; M. Thompson, & M. Weinrich (2011) **Underwater Components of Humpback Whale Bubble-Net Feeding Behavior.** *Behaviour* 148:575-602. (journal cover)

Parks, S.E., J.D. Warren, K.M. Stamiezkin, C.A. Mayo and D. Wiley. (2011) **Dangerous dining: Surface foraging of right whales increases risk for vessel collisions.** *Biology Letters*

Cannin, C., Craine, D., Eaton, T.S., Nuessly, K., Feidlaender, A., Hurst, T., Parks, S., Ware, C., Wiley, D., Weinrich, M. (In Press) **Population-level lateralized feeding behavior in North Atlantic humpback whales (*Megaptera novaeangliae*).** *Animal Behavior*

In addition, BioMedLib's, "Who is Publishing in My Domain?" listed Wiley DN, Moller JC, Pace RM, Carlson C: **Effectiveness of voluntary conservation agreements: case study of endangered whales and commercial whale watching.** *Conserv Biol*; 2008 Apr;22 (2):450-7 as one of the top ten papers in its domain as of July 2011.

Media Coverage:

SBNMS research on bubble-net feeding in humpback whales received international media attention including National Public Radio's **Talk of the Nation (Science Friday)** "Pick of the Week". Science Friday correspondent Flora Lichtman produced a presentation of the research featured on the NPR website. To date almost 10,000 people have viewed the site, which includes links to NOAA, ONMS, and SBNMS. The research was also featured on the French science television program *Universcience.TVe*. 10 pages of references for the research are contained in Google, including Science Direct, Earth & Sky, and Mother Jones magazine (pick of the week).

SBNMS research was featured in the **BBC television** documentary, "*Death of the Oceans*" This is a high production quality film that featured scientists from around the world and was narrated by **David Attenborough**.

SBNMS research was also highlighted in **Greenfire Production's Ocean Frontiers** documentary. "Ocean Frontiers travels coast to coast and the land in between: From Stellwagen Bank National Marine Sanctuary, where shipping executives and marine scientists came together to keep endangered whales and giant ships from colliding; to the Florida Keys where divers and fishermen have turned controversy over marine conservation into a blueprint for industry and conservation collaboration; to the banks of the upper Mississippi River in Iowa, where farmers—by better tending the soils of their fields—are helping restore the Gulf of Mexico more than a thousand miles away; and to the West coast, where the three states are collaborating to ensure ocean health and a visionary fishing community is combining local knowledge and science to safeguard their cultural and natural heritage." David Wiley received invitational travel to join a panel discussion of Greenfire's Ocean Frontiers hosted by the Aquarium of the Pacific 26 – 28 March.

SBNMS research on humpback whale bubble-net behaviour will be highlighted in an upcoming **BBC/Discovery Channel program "Animal Einsteins"** exploring the intelligence of non-humans.

SBNMS research were highlighted in Harvard Magazine featuring Dr. Joe Romans work on whales providing important nutrients to the Gulf of Maine and SBNMS ecosystem.

*** MITIGATION AND MONITORING ASSOCIATED WITH CONSTRUCTION AND OPERATION OF LIQUIFIED NATUREAL GAS IMPORT TERMINALS**

SBNMS staff reviewed weekly reports and permit applications (under the Marine Mammal Protection Act) during fall 2010. The ten real-time detection buoys installed in the Boston shipping lanes to mitigate impacts due to transiting LNG vessels continue to provide information.

Development of the Whale Alert app by science team and collaborators - The *Whale Alert* software application provides mariners and others with easy to use nautical chart-displayed information about regulations and other conservation efforts designed to reduce the risk and impact of collisions between right whales and ships. The effort should decrease the risk of mariners being fined for violating regulations and increase chances of right whale survival. *Whale Alert* represents an innovative collaboration among government, industry, academic and conservation interests*

Partners include:

- Bioacoustics Research Program, Cornell Laboratory of Ornithology, Cornell Univ;
- Center for Coastal and Ocean Mapping, University of New Hampshire;
- EarthNC;
- Excellerate Energy;
- Gaia GPS
- International Fund for Animal Welfare;
- Massachusetts Port Authority;
- National Oceanic and Atmospheric Administration, National Marine Fisheries Service;
- National Oceanic and Atmospheric Administration, Stellwagen Bank National Marine Sanctuary;
- National Park Service; Cape Cod National Seashore
- Suez Energy;
- United States Coast Guard;
- Woods Hole Oceanographic Institute.

*** INTERNAL WAVE PROJECT**

(Funded provided to D. Wiley, J. Pineda, J. da Silva and V. Starczak by Sea Grant, 2008-2011)

In June-July 2011, the sanctuary and Woods Hole Oceanographic Institution will add to this multi-year project to investigate the effect of internal waves on the distribution and behavior of baleen whales in the sanctuary. A tablet data collector with integrated GPS and customized database was updated to accommodate more and standardized marine mammal offshore data collection. Additional gear was added

to the cruise this year to collect plankton abundance at the surface as well as a kite camera to document the wave. The 2011 cruises required coordination with over 30 researchers (NOAA Fisheries, WHOI, WCNE, NEAQ & Volunteers) aboard the R/V Auk to assist with the sophisticated gear and marine mammal observations. Monitoring gear consisted of: buoy system with vertical temperature string sensors, acoustic Doppler current profiler (ADCP), plankton pump and nets, CTD's, two bionsonic multi-beam units, EK60 echo-sounder, underwater drop camera video system with depth sensors, kite camera flown at 200 feet, all to monitor for the presence and absence of and describe the structure of internal waves. Five days of fieldwork will be conducted on the southwest corner of Stellwagen Bank to quantify cetacean distribution and behavior before and after internal wave activity.

*** AIS VESSEL TRACKING AND COMPLIANCE WITH THE NOAA RIGHT WHALE SHIP STRIKE RULE**

(Funded to D. Wiley by International Fund for Animal Welfare/IFAW)

Analyses using AIS data to characterize compliance with NOAA's speed restrictions in the Off Race Point and Cape Cod Bay Seasonal Management Areas are ongoing. Acquired outside funding from IFAW to support the development and purchase of a state-of-the-art GIS super-computer tower for processing large amounts of data at speeds that far out perform and sanctuary owned equipment. This high performance computer, for example, has proven itself by processing over 150 million Automatic Identification System (AIS) records to GIS for analysis over the course of few hours whereas the sanctuary owned machine used previously took over 38 hours to complete the same task. Due to the large number of data records in our spatial datasets many of the analyses we've run in the past simply have not been possible with other computers and I designed and built routines to make sanctuary research and my time much more efficient and cost effective, and perhaps one of a kind. This has kept us at the forefront of AIS analysis and we receive constant requests within NOAA and from outside academia and industry for our AIS expertise. Under the IFAW grant, we sent out 227 letters advising vessel owners of the SMA rule and their compliance during the 2010 season as an educational tool. We are currently working up the 2011 AIS data for 234 vessels. We used SBNMS's expansive AIS data library that currently holds over 1 billion records to complete this analysis. We manage this library along with the AIS network and infrastructure that is essential for this, and other, projects.

Publications & Presentations:

Modeling Speed Restrictions to Mitigate Lethal Collisions between Ships and Whales in the Stellwagen Bank National Marine Sanctuary, USA. David N. Wiley¹, Michael Thompson¹, Richard M. Pace III², and Jake Levenson³. *Biological Conservation* 144: 2387-2381 (2011).

Vessel Compliance & Commitment in the Cape Cod Bay and Off Race Point Right Whale Seasonal Management Areas. Michael Thompson, David Wiley, Brad Cabe, Richard Pace, and Jake Levenson. 19th Biennial Conference on the Biology of Marine Mammals Nov. 30- Dec. 5 2011, Tamp FL.

Outreach and Education to Increase Vessel Compliance and Commitment in Right Whale Seasonal Management Areas.** D. Wiley, B. Cabe, P. DeCola, D. Gouveia, Deborah Hadden, J. Levensen, T. Nickerson, M. Thompson¹, and B. Wellock. 19th Biennial Conference on the Biology of Marine Mammals Nov 30- Dec 5, 2011, Tamp FL. **Presentation received the Society for Marine Mammalogy's award for *Excellence in Scientific Communication

David Wiley received a prestigious *Ian Axford (Fulbright) Fellowship in Public Policy* to study research that is conducted to inform decisions in New Zealand's Marine Protected Areas. He and his family lived in Wellington, NZ from 2 February – 2 September 2011.

Publication:

Wiley, D.N. (2011). *Increasing the Social Power of Scientific Information used for Decisions on Marine Protected Areas in New Zealand*. Fulbright New Zealand. Wellington, New Zealand. Pp 82.

Executive Summary:

Environmental problem-solving in the 21st century has moved away from the techno-rational approach that dominated past decision-making and management. Modern decision-making is increasingly viewed as deliberative and participatory, characterised by multi-stakeholder processes such as those convened to inform decisions in New Zealand's marine protected areas. Information provided to stakeholders for decision-making contains both social and technical components. Traditionally scientists have focused on the technical aspects of problem-solving and counted on confidence in the scientific process to eliminate social concerns, such as research bias or the vested interests of scientists affecting their results or the communication of their findings. However, this study demonstrates that social aspects of research are a high-order concern and invariably used by stakeholders to invalidate information that is counter to their preconceptions or desires. Therefore, research that ignores social concerns has substantially reduced impact on problem-solving and decision-making. In this study, the ability of information to influence stakeholder decisions is termed "social power", with increased social power associated with increased positive influence.

Results from stakeholder interviews (n=30) and analysis indicate that one way scientists can reduce the social concerns that invalidate their findings is to increase the inclusive aspect of their research. Stakeholder involvement in research can take many forms and I provide a "Ladder of Scientific Participation" that can help identify ways that scientists might interact with stakeholders, and the potential outcome and results of each. Rungs 1 – 3 of the ladder are "first-order" methods, which are typical of traditional forms of stakeholder participation. Traditionally stakeholder participation in science has been relegated to reading scientific information or listening to scientific information summarised by managers. First-order participation has low social power because the numerous barriers to accepting information identified in this study are ignored. The outcome of first-order participation is that stakeholders selectively accept information that bolsters their position and reject information that could undermine it. Therefore, such levels of participation lead to stakeholders becoming increasingly entrenched in their positions instead of using information to promote problem-solving and consensus decisions.

Rungs 4 – 6 of the ladder consist of "second-order" methods, demonstrating increased participation. Second-order techniques would consist of scientists presenting their research design to stakeholders prior to initiating an investigation, providing stakeholders with updates on research as it is being conducted and providing stakeholders with the opportunity to visit and observe the research as it is being conducted. The outcome of second-order participation is that scientists and stakeholders are educated about the research and the conditions under which it will occur. This would include the ability of stakeholders to identify unexpected deficiencies and concerns that could invalidate the research's final results and the ability of scientist(s) to mitigate such concerns by adapting design changes while it is still possible to do so. Therefore second-order methods add substantial social power to research by increasing stakeholder confidence that their concerns are being understood and addressed.

Rungs 7 – 9 of the ladder are "third-order" methods, incorporating maximum levels of participation. Rung 7 involves stakeholders participating in the selection of scientists conducting the research, allowing the research to be conducted by scientists with whom opposing interests have confidence (i.e., Research by Champion). Increased participation (rung 8) would involve stakeholders contributing to the selection of the scientists conducting the research and the research design that they would use. This could involve stakeholder participation in the review and selection of grant proposals or reviewers placing a positive emphasis on proposals that demonstrated stakeholder involvement. The outcome of these types of participation is the collaboration of scientists with a diversity of views, a robust problem definition and

research design and increased social power of the results.

The top rung of the ladder (rung 9) would have stakeholders or stakeholder scientists directly participating in the research (i.e., Team of Rivals). This would assure that the greatest diversity of interests and perspectives were included in the research and that the concerns of all were being addressed. As such, it would provide maximum social power to the results. However, such large collaborations could become expensive, logistically difficult and paralysed by infighting.

In summary, the traditional perception that scientific research is viewed as providing credible and unbiased information because research is conducted in isolation from those most impacted by its results (i.e., stakeholders) is invalidated by this study. Such research contributes to stakeholder entrenchment by allowing stakeholders to construct myriad reasons to reject it, rather than contributing to problem-solving by providing agreed upon information for decisions. Research that is inclusive, balanced by a diversity of interest and demonstrates a full set of problem definitions and potential solutions, as identified by those impacted by them, is identified as providing results that are seen as more credible and more likely to be accepted by stakeholders for consensus decisions. Attention to such aspects of research will increase the social power of results and help scientists achieve the scientific ideal of producing information that is judged unbiased and defensible. Ultimately, increasing the social power of scientific research will increase its efficacy as a cost effective problem solving tool, thereby increasing its ability to conserve biodiversity and protect the resources and economies on which we depend.

Presentation made to Fulbright New Zealand; Wellington NZ, University of Victoria; New Zealand, Conference on Industry and the Biosphere; Washington DC, NOAA Brown Bag Seminar; Silver Spring.