



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric
Administration
Office of National Marine Sanctuaries
Stellwagen Bank National Marine Sanctuary
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34th SANCTUARY ADVISORY COUNCIL
14 September 2011 9:00 am – 3:30 pm
Dedham Boston Hilton Hotel, Dedham MA
MINUTES of MEETING

Present:

Bill Adler	Member:	Fixed Gear Commercial Fishing
Jennifer Anderson	Federal:	National Marine Fisheries Service
Michelle Bachman	Federal:	NE Fisheries Management Council
Theresa Barbo	Member	At Large
Priscilla Brooks	Member:	Conservation
Al Cottone	Alternate:	Mobile Gear Commercial Fishing
Jamie Cournane	Member:	Research
Deborah Cramer	Member:	At Large
Rich Delaney	Member:	Education (Chair)
Susan Farady	Alternate:	Education
Robert Foster	Alternate:	Diving
Vito Giacalone	Member:	Mobile Gear Commercial Fishing
Jonathan Grant	Alternate:	At Large
LCDR Ryan Hamel	Federal:	USCG
Heather Knowles	Member:	Diving (Executive Committee, Acting Chair)
Judy Laster	Alternate:	At Large
Chris McGuire	Alternate	Conservation
Steve Milliken	Member:	Whalewatching
Tim Moll	Member:	Business/Industry
Rob Moir	Member:	Conservation
Frank Morton	Member:	Marine Transportation
Wayne Petersen	Alternate:	Conservation
David Pierce	State:	MA Division of Marine Fisheries
Daniel Pingaro	Alternate:	At Large
David Robinson	Member:	Maritime Heritage
Robert Rocha	Alternate:	Education
Michael Sosik	Alternate:	Recreational Fishing
Capt. John Tulik (Rep)	State:	Massachusetts Environmental Police
John Williamson	Member:	At Large (Executive Committee, Secretary)
Brad White	Alternate:	Recreational Fishing

SBNMS Staff:

Craig MacDonald	Deborah Marx	Elizabeth Stokes
Ben Cowie-Haskell	Anne-Marie Runfola	Michael Thompson
Brad Cabe	Dave Slocum	Nathalie Ward
Leila Hatch	Alice Stratton	Evelyn Ganson (Volunteer)
Matthew Lawrence		

Others Present:

John Armor, ONMS HQ
 Ben Sherman, ONMS HQ
 Rebecca Holyoke, ONMS HQ
 Paul Ticco, ONMS, NE Region & Great Lakes
 Kara Woo, ONMS HQ Intern

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

The Agenda was reviewed and approved. The 32nd SAC Minutes were approved, following one correction to add Bob Foster, Alternate Diving, to SAC members present at the 33rd SAC Meeting.

II. SBNMS Business (Craig MacDonald)

FY2011 Budget Update. No update to provide since the last SAC meeting in May.

III. SAC Business (Nathalie Ward and Craig MacDonald)

i. New Members Welcome and Future Recruitment. Craig introduced new members and expressed his appreciation for their willingness to serve on the SAC:

Wayne Petersen, Mass Audubon Society - Conservation Alternate
 Chris McGuire, Marine Program Director, Nature Conservancy - Conservation Alternate
 Jonathan Grant, Lighthouse Technical Consultants - At Large Alternate

Dr. Peter Auster, member for many years, has resigned to turn his attention fully to his research. Craig MacDonald expressed his gratitude for the many years that Peter has served on the SAC. Research collaboration will continue between Peter and sanctuary staff.

Recruitment is ongoing for two Research Alternates. SAC members are requested to pass the word along to their constituents.

ii. 2012 Meeting Dates. The next SAC meeting will be either end of January or February, followed by end of May or early June.

iii. 20th Anniversary SAC Challenge. Nathalie gave an update on events that will take place throughout 2012. SAC members provided a brief overview of their proposed contributions to the SAC Challenge. (See Appendix I for the list of SAC members’ contributions to the 20th Anniversary SAC Challenge.)

Michael Sosik reported that the Recreational Fishing Community does not plan to participate.

Craig expressed his appreciation and thanked SAC members who have contributed to raise awareness of SBNMS.

iv. Programmatic Updates. Craig MacDonald and Nathalie Ward provided a summary of sanctuary staff programmatic updates (see Appendix II).

Comments:

Bill Adler: SBNMS staff is looking at a granite shipwreck to designate it as a national historic site. Beginning to have too many of these places around fishing areas. Does the SAC have a say as to whether SBNMS applies to designate this as an historic site? He listed several wrecks already on NHP list and voiced concern when “you start blocking off everything.”

Craig MacDonald: There is such a proposal in the development. It is federal property and staff is required by law to submit a proposal under the National Marine Sanctuaries Act to request that it be designated as a protected site.

v. SAC Youth Seat Subcommittee (Dave Robinson and Rob Moir).

Rob Moir gave an overview of SAC Youth Seat. Presently, there are two other sanctuaries, Hawaii Humpback Whale Sanctuary and US Monitor Sanctuary that have SAC youth seats. The SBNMS SAC made a motion two meetings ago to add a SAC youth seat to its membership. Rob Moir reported that the idea is to add a youth member, 14-18 years old, to the SAC. The next step, which has been completed, is to send this approval of adding said membership to the SAC to ONMS HQ and have the SAC Charter amended accordingly. So likely by December 2011, an amendment will be made to the Charter that changes the current 17 members to 18 members - the 18th seat being a youth non-voting member and alternate. The language of the SAC Charter will correspondingly reflect this change. Subsequent to that, the job description will need to be clarified for that position. The announcement then will be posted in the Federal Register Notice to help advertise. The hope is that there will be applicants applying in April 2012, and then to have one or two people selected. The nominees will have to be submitted to ONMS HQ for approval. Hopefully by September 2012, the SAC will be able to recognize a new SAC youth member.

vi. SAC Leadership Award and Subcommittee (John Galluzzo). John Galluzzo will be chairing this subcommittee and as he is absent, we look forward to a report at the next SAC meeting.

IV. Draft SERA Proposal and Discussion (Craig MacDonald)

Craig MacDonald presented a comprehensive overview of the Draft Proposal to establish a Sanctuary Ecological Research Area (SERA). The Draft SERA Proposal was officially released to the public on 14 September. The draft proposal is available online at www.stellwagen.noaa.gov. A brief summary of the draft proposal follows:

- Given the Essential Fish Habitat (EFH) Omnibus amendment process underway by the New England Fishery Management Council (NEFMC) and in response to a recommendation in the 2010 revised Stellwagen Bank Sanctuary Management Plan, the Office of National Marine Sanctuaries has developed a draft proposal to consider establishing the SERA.
- The proposed area would encompass 251 sq. nautical miles (39%) of the SBNMS or 0.9% of the Gulf of Maine.
- The proposed SERA would establish four subareas in SBNMS which include an area that prohibits all fishing (13.8% of SBNMS); an area that restricts fishing to hook-and-line only (16.5% of SBNMS); and an area that allows all gear types except bottom-tending mobile gears (8.7% of SBNMS). The

remainder of SBNMS (61% of SBNMS) would continue to be open to fishing pursuant to NMFS fishery regulations.

- Three criteria were used to design the proposed SERA: (1) minimizes impacts to fishing activities, (2) realizes equitable habitats representation, and (3) controls for oceanographic regimes.
- The proposed SERA would help discern how variations in the direct impacts of fishing affect elements of biodiversity. Additionally, the proposed SERA would help address some outstanding fishery management questions such as how habitat quality contributes to fisheries productivity and defining measurable thresholds for achieving the minimization of adverse effects on essential fish habitat.
- There currently are no places within the sanctuary (or the Gulf of Maine) that can serve as true reference areas in the absence of direct human impacts.
- More than half of the proposed SERA is currently closed to most bottom contact fishing gear through the existing Western Gulf of Maine Closure Area (WGoMCA). The existing WGoMCA overlaps approximately 22% of the eastern region of the sanctuary (called the “sliver”), and currently allows the following gear types: lobster pots, hagfish pots, pelagic longline, pelagic hook and line, recreational hook and line, pelagic gillnets, tuna purse seining, and midwater trawls. All other gears capable of catching groundfish are currently not allowed in the Sliver per NMFS regulations.
- The sliver is currently a *de facto* reference area – serving as the foundation for a number of studies (e.g., University of Connecticut, Boston University, Woods Hole Oceanographic Institution, University of Maine). However, the existing configuration:
 - Does not resolve explicit effects of fishing by gear type and habitat (and associated biological communities) – understanding the differences may lead to findings that certain gear has fewer impacts than previously thought; and
 - Under-represents deep mud habitat relative to the sanctuary overall, limiting the ability to understand variation in the dynamics of deep mud communities and the effects of fishing in this habitat type.
- In terms of the impact on fishing trips, of the 118,174 trips (commercial and party/charter) conducted in SBNMS from May 1, 1998 – 2009, the proposed SERA would affect 4.6% of the mobile gear trips, 4.8% of the fixed gear trips, 0.9% of party trips, and 0.6% of charter trips.
- In terms of maximum potential economic impact (worst case scenario), the proposed SERA would affect less than 1% of sales, income and employment for both the commercial fishing and seafood sector and the party/charter fishing sector in New England.

Craig concluded his presentation by emphasizing that NOAA is not intending to submit this proposal to the New England Fishery Management Council at this time. NOAA will reconsider submitting the proposal to the NEFMC after it assesses the economic impacts of the transition to sector-based management.

In order to structure the discussion on the proposal so that it was more focused on process rather than specifics, Chairman Delaney entertained a motion from the SAC Secretary John Williamson.

FIRST MOTION: The SBNMS Advisory Council recommends that, as soon as is feasible, NOAA submit the SERA proposal to the New England Fishery Management Council for consideration as a research area consistent with the objectives of the Fishery Management Council’s Omnibus Habitat Amendment 2. We also recommend that, once it is under consideration, the ONMS work cooperatively within the Fishery Management Council process so that the SERA proposal is integrated, in an appropriate way, with other actions the Fishery Management Council may take to ensure economic balance for affected fishermen.

SAC Vice-Chair Heather Knowles seconded the motion.

The chair then facilitated a discussion on the motion and entertained technical comments and questions about the proposal. The following is a snapshot of the discussion by topic area. (An audio transcript of the discussion is available upon request).

Commercial Fishing

Subareas A and C would affect mobile gear fishermen. This would eliminate bottom trawlers in a large area. Discussion ensued about the percentage impact on those vessels that rely on this area for the majority of their catch and income; discussion of trade-offs between areas; and consideration of other areas for a research closure in areas less heavily fished.

Recreational Fishing

Clarification was provided about the economic analysis. The estimated total economic impacts of the proposed SERA subareas included the multiplier impacts to sales, employment, and income of all businesses associated with the party/charter recreational fishing industry in the Northeast Region (defined as ME, NH, MA, RI and explained in Appendix I of the draft proposal). Impacts to the analysis were trip expenditure data which included costs for transportation, food (e.g., restaurants), lodging (e.g., hotels), fuel, charter fees, tips, and tackle (explained in Appendix III of the draft proposal). The draft proposal did not specify duration of closure but indicated a long-term time frame was needed.

Fishing Impacts

The issue of displacing fishing effort causing unforeseen conflicts among different gear types was raised. Reference was made to the Step 2 socioeconomic analysis overview summarized in Appendix IV of the draft proposal for treatment of this and related effects.

Economic Impacts

Important to understand what maximum potential loss is and that it will likely never be realized. The Step 2 analysis provides a qualitative description of mitigating factors (Appendix IV of the draft proposal).

History of Research Areas in SBNMS

This draft proposal is the result of an extensive public process involving two working groups that informed the management plan process and one subsequent zoning working group that was specifically charged with considering zoning but could not arrive at a consensus. While no consensus was reached by the Zoning Working Group on specific zoning options, the recommendations of the scientific subgroup of the Zoning Working Group were clear. The scientific subgroup recommended protection of representative examples of the full range of biological communities associated with seafloor habitats (e.g., deep mud, boulder reefs), protection and enhancement of size class composition for all species, and protection of key ecological patterns indicative of community and ecosystem processes. With that guidance and by means of this draft proposal, SBNMS is implementing Strategy 2.1 to initiate a process that establishes scientific research reference areas in representative communities (using seafloor habitats as proxies) in the sanctuary.

EFH Omnibus Amendment

Some members were confused why NOAA would not submit this proposal at this crucial time in the amendment process. There were questions over what authority would be used to implement this: Magnuson Act, Sanctuaries Act or some combination.

Research Design and Funding

Some questioned whether there would be funding to conduct the research, whether some of it could go to fishermen, and what hypotheses would be addressed.

Voting

Some members felt the SAC was not prepared to take a vote when it had no input on proposal.

After discussion of proposal, Chairman Delaney entertained comments/discussion on motion.

Motion Passed 9 in favor, 5 opposed, 0 absentions:

Bill Alder:	No
Theresa Barbo:	Yes
Priscilla Brooks:	Yes
Jamie Cournane:	Yes
Deborah Cramer:	Yes
Vito Giacalone:	No
Heather Knowles:	Yes
Steve Milliken:	Yes
Steve Moir:	Yes
Tim Moll:	No
Frank Morton:	No
Robert Rocha:	Yes
John Williamson:	Yes
Michael Sosik:	No

After some discussion by SAC members regarding motion, Vito Giacalone presented a second motion:

SECOND MOTION: SAC request that SBNMS convey to the NEFMC support for analysis that could identify alternative areas representative of the areas delineated on the draft SERA that are contiguous to the Sliver and east of the Sliver, for the purpose of establishing an ecological research area. Seconded by Bill Adler.

Extensive discussion ensued on the second motion regarding the Sliver and alternative areas east of or adjacent to the Sliver that could be considered. Some members questioned whether areas east of the Sliver were under consideration for a research area. Michelle Bachman, NEFMC staffer, was not aware of any proposals for that area. Some felt that the place for consideration of alternative areas was at the NEFMC. There were concerns about how a research area would be managed that was both inside and outside of the SBNMS. The SBNMS has no jurisdiction beyond its boundaries. A research area east of the Sliver would not provide a treatment to look at the effects of fixed and mobile gear; however, it would affect fewer fishermen since it's been closed for 13 years to bottom tending gear (mobile and fixed).

Rich Delaney recommended modifying the language of the motion.

Rewording of second motion: SAC request that SBNMS convey to the NEFMC support for analysis that could identify an alternative area representative of the habitats delineated on the draft SERA, that include the sliver, are contiguous to the sliver and east of it, for the purpose of establishing an ecological research area.

John Williamson makes a third motion to table the second motion until the Adhoc Committee convenes and fleshes out this idea with more detail.

Failed 9/4 with 1 abstention

Bill Adler: No
Theresa Barbo: Yes
Priscilla Brooks: Yes
Jamie Cournane: Yes
Deborah Cramer: Yes
Vito Giacolone: No
Heather Knowles: No
Steve Milliken: No
Tim Moll: No
Rob Moir: No
Robert Rocha: No
Michael Sosik: No
Frank Morton: No
John Williamson: Abstained

There was a lot of discussion and confusion on the wording and area being considered and the intent of second motion, and opposition to table this motion. Rob Moir motions to “Call the question”
A consensus on second motion cannot be reached.

Rich Delaney recommends postponing this discussion until the next SAC meeting to give a chance to fashion this until it’s really effective and can build relationships, and bring back a better defined motion at the next meeting.

Vito Giacolone – offers to withdraw second motion. Bill Adler seconds. All agree.

Final Comment by Chairman Delaney: That 34th SAC Meeting Minutes reflect there has been a lot of discussion about the larger process that is going to go on in the Council and there is a lot of support among the SAC in continuing to find appropriate areas whether they are inside or outside the boundary of the sanctuary to get to the right ecosystem research area including areas that are appropriate within the sanctuary and that the SAC will come back and revisit this discussion in the next SAC meeting. Rich thanked everyone for a reasoned deliberation and hopes that NOAA will move as soon as possible on the first Motion.

V. Working Luncheon - Seabirds in the Sanctuary (Wayne Petersen)

The shallow banks and shelves of the Gulf of Maine region, including Stellwagen Bank National Marine Sanctuary (SBNMS), have long been known to support large numbers of seabirds. Mass Audubon has designated Stellwagen Bank an Important Bird Area (IBA). An IBA is a site that provides essential habitat to one or more species of breeding, wintering or migrating birds, and which supports high-priority species, large concentrations of birds, exceptional bird habitat, and/or has substantial research or educational value. Wayne Petersen, SAC Member and the Mass Audubon Director of Important Bird Areas for Massachusetts, gave a presentation on seabirds, focusing on species that use the sanctuary, their identifying features, unique behaviors, seasonal variability and migratory patterns. He emphasized the importance of seabirds in the sanctuary ecosystem, noted threats, and confirmed the need for more baseline data on seabirds in SBNMS.

VI. Stellwagen Bank Sanctuary Seabird Stewards Program (S4) (Anne-Marie Runfola)

Anne-Marie Runfola, SBNMS Volunteer Coordinator, followed Wayne's talk with a short presentation on a new seabird study in the sanctuary involving citizen scientists. Stellwagen Bank National Marine Sanctuary, in collaboration with Mass Audubon, is pioneering the study. The program goals are threefold: to systematically collect baseline data on seabirds to compare occurrence and abundance over time; to train a group of volunteer observers to join our scientists in this groundbreaking project; and to educate the public about seabirds and connect residents with their sanctuary. The resulting data will help us understand populations within the sanctuary and their possible impacts on local ecosystems and will be used as a barometer for other changes in the environment. Volunteers accepted into the S4 program have the exceptional opportunity to work with the professional sanctuary and Mass Audubon research staff at sea. Fifteen Stewards were trained to collect seabird data on the sanctuary research vessel, *R/V Auk*, and on commercial whale watch boats. They successfully completed their first cruise on August 2nd, 2012, counting 1,415 birds over the 63-mile transect. SBNMS will continue the pilot study with three more trips on the *R/V Auk* this year, including the annual Christmas Bird Count. Stewards will pilot data collection on whale watch vessels this fall to gather additional information on seabirds in the sanctuary. In 2012, we plan to run at least five seabird cruises and deploy stewards weekly on whale watch vessels.

VII. Partner and Constituent Reports.

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

Harbor Porpoise Bycatch

Preliminary analyses for the first of two management seasons suggest that harbor porpoise bycatch rates in the Gulf of Maine and Southern New England areas may be above the target rates established for those areas which, if not reduced, could lead to closures to gillnet fishing. If the target harbor porpoise bycatch rates have been exceeded after two consecutive management seasons then the areas will be closed to gillnet fishing during times of the year when the fishery and harbor porpoise tend to overlap, leading to historically high bycatch levels. To help prevent this, NMFS is urging fishermen to comply with pinger requirements during the upcoming Harbor Porpoise Take Reduction Plan management season, which begins on September 15th. For more information contact Mike Asaro at (978) 282-8469.

Monitoring Plan for the Atlantic Large Whale Take Reduction Plan (ALWTRP)

NMFS is finalizing a monitoring plan for the ALWTRP. This plan will evaluate industry compliance with the regulations implementing the ALWTRP and overall effectiveness of the ALWTRP restrictions toward achieving its management objectives. NMFS plans to finalize the monitoring plan in late September and submit to the Atlantic Large Whale Take Reduction Team (TRT) for review in October 2011. NMFS plans to convene the Northeast and Mid-Atlantic/Southeast Subgroups of the TRT in November 2011 to seek comment on the monitoring plan. After considering the comments NMFS will finalize the monitoring plan and provide the final plan to the full TRT at its January 2012 meeting. For more information contact Kate Swails at (978) 282-8481.

ALWTRP Vertical Line Rule

NMFS is continuing its development of the vertical line (buoy line) rule. The intent of the rule is to reduce the risk of serious injury and mortality to large whales that encounter buoy lines associated with trap/pot and gillnet gear. NMFS completed 16 public scoping meeting between July 11 and August 24. Based on the oral and written testimony received NMFS is drafting potential management alternatives. In addition, members of the TRT are also providing NMFS alternatives that they have developed in

consultation with their respective organizations. These proposals are to be submitted to NMFS no later than September 30. NMFS will analyze these proposals utilizing their vertical line model and share the proposal with the TRT at its January 2012 meeting. At the January meeting NMFS intends to finalize a full suite of alternatives that would be used as part of NMFS proposed rule process and supporting Environmental Impacts Statement. For more information contact Kate Swails at (978) 282-8481.

Atlantic Sturgeon

On October 6, 2010 NMFS published 2 proposed rules proposing to list four DPSs (New York Bight, Chesapeake Bay, Carolina, and South Atlantic) as endangered under the ESA and one DPS (Gulf of Maine) as threatened. NMFS will be making a final listing determination by October 6, 2011. If the species is listed, critical habitat will be proposed for each DPS in early 2012. For more information contact Kim Damon-Randall at (978) 282-8485.

Listing Petitions

In August 2011, NMFS received four separate petitions to list the following marine species: alewife and blueback herring; scalloped hammerhead shark; thorny skate; and one petition for four skate species (thorny, barndoor, winter, and smooth). NMFS is currently reviewing the information in each of the petitions to determine if they contain substantial information indicating the petitioned action may be warranted. NERO has the lead for both of the skate petitions and the alewife and blueback herring petition. A 90 day finding for each of the petitions will be published in November 2011. If the petitioned action may be warranted, a review of the status of the species will be initiated. For more information contact Kim Damon-Randall at (978) 282-8485.

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

NEFMC will be making decisions on various actions at their September meeting:

- Scallops – approval of Framework 23, which includes alternatives related to adoption of a turtle deflector dredge, adjustments to the Northern Gulf of Maine program, adjustments to Vessel Monitoring System requirements, and adjustments to the yellowtail flounder accountability measures for the sub ACL (annual catch limit) allocated to the scallop fishery.
- Skates –approval of 2012-2013 fishery specifications – this includes updated landings limits, updated possession limits for skate wings, and updated possession limits for whole skates for the bait fishery.
- Whiting –approval of annual catch limit and accountability measure alternatives to be considered for the small mesh fishery
- Monkfish – approval of goals and objectives for Amendment 6, which will consider catch share management in the fishery
- Groundfish – update on Framework 47, which, among other things, will implement specifications for 2012-2014; review of transboundary management guidance committee advice for E GB cod and haddock and GB yellowtail, possible adoption of recommended quotas; discussion of upcoming sector workshop
- Herring – approval of Amendment 5 DEIS for further public comment/hearings and possible selection of preferred alternatives. Amendment 5 includes adjustments to the fishery management program and reporting requirements for vessels and dealers, measures to address trip notification requirements, carrier vessels, and transfers of herring at-sea; also a catch monitoring program that could maximize sampling and address net slippage, alternatives to allocate observer

coverage on limited access herring vessels; river herring bycatch and criteria for midwater trawl vessel access to year-round groundfish closed areas.

Also, there will be preliminary discussion of management priorities for next year, and additional discussion about the management review and actions taken in response to the review. Habitat and the Omnibus Amendment are not formally on the September agenda but will likely come up in the context of priorities.

iii. US Coast Guard Award (LCDR Ryan Hamel).

The Coast Guard has a Coast Guard Auxiliary Program, which is comprised of a large volunteer workforce. It is about the same size as the CG and CG Reserves combined. The CG Auxiliary volunteers time to auxiliary missions like conducting recreational boating safety classes and commercial fishing vessel exams. CPT DeCola had the opportunity to recognize Ron Armonath, an auxiliary member, who runs a program on Stellwagen Bank NMS where he has auxiliary observers on whale watch ships and being active on the water monitoring vessel harassment as well as providing sighting information of whales to the CG system. Ron took a lot of time over the last 4 years to develop this program, putting people on the water with GPS locators and video cameras to start giving witness statements so violations on the Stellwagen Bank could be documented. He has trained about 25 volunteers to do this mission with him. This is a great force multiplier for the CG, and CPT DeCola is very excited about the program because it is a way for the CG to have a presence on the water without using a lot of resources and time. The CG Auxiliary volunteers can be seen on whale watch boats in uniform with video cameras. This is providing a great service to CG as well as providing a lot of information that the CG cannot see in day-to-day operations.

VIII. New SAC Issues. None.

IX. New Business. None.

X. Public Comment. Bill Adler expressed his disappointment on behalf of one of his constituents that there was no time allotted for public comment during the SERA Draft Proposal discussion. Heather Knowles acknowledged this and will pass along this concern to the SAC Chair.

XI. Motion to Adjourn: Unanimous -- at 3:10 pm.

APPENDIX II

SBNMS PROGRAMMATIC REVIEW—SUMMER 2011

MARITIME HERITAGE: Deborah Marx and Matthew Lawrence

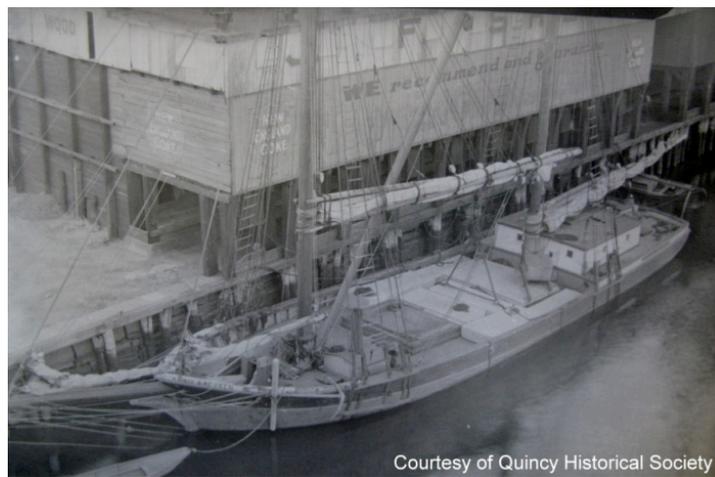
Staff presented on the sanctuary's SCUBA diving opportunities to the Northeast SCUBA Club. Club members were very interested in visiting sanctuary dive sites as they were entirely new destinations for the divers.

Staff manned the sanctuary's booth at Scituate's Heritage Days festival. Several hundred visitors stopped by and many were Scituate residents who were happy to see our participation in the event. Several sanctuary volunteers participated in the outreach event.

The Society for Historical Archaeology (SHA) Spring Newsletter and Commercial Fisheries News carried articles on the eastern rig dragger *Edna G.*'s National Register of Historic Places listing.

Staff wrote two online articles on sanctuary maritime heritage and shipwrecks for the Museum of Underwater Archaeology (<http://www.uri.edu/mua/>). The online exhibits for the "in the field" section were entitled "Vanishing Icon of New England's Fishing Fleet" on the sanctuary's eastern rig dragger shipwrecks and "Coal Schooners in the Stellwagen Bank National Marine Sanctuary." The online Museum of Underwater Archaeology (MUA) is a 501c3 non-profit organization incorporated in 2004. Its mission is to assist and promote the use of the Internet by ethical professional, student, and avocational underwater archaeologists. The MUA helps underwater archaeologists present their research to the general public by creating web based museum-style exhibits.

Staff conducted historical research into the granite trade and visited a variety of archives including: the Sandy Bay (Rockport) Historical Society, Gloucester Public Library, Quincy Public Library, Quincy Historical Society, and the University of Maine at Orono. The research uncovered several new historically reported shipwrecks that likely sank in the sanctuary and information about the New England granite trade and its role in building this nation.



Archival research uncovered materials, like this photo of the schooner *Annie and Reuben* with a

deck load of granite, that will shed light on sanctuary shipwrecks found with granite cargos.

Staff conducted 5 days of side scan sonar survey for maritime heritage inventory and marine debris location efforts on behalf of Stellwagen Alive!. The fieldwork mapped 9 square-km of the sanctuary's seafloor. Staff also conducted SCUBA diving and ROV fieldwork to monitor and characterize several archaeological sites including the *Paul Palmer* and Unidentified Trawler.



The installation of a sub-surface mooring on the Unidentified Trawler has increased diver interest in visiting the sanctuary. Sanctuary staff have been monitoring the site for signs of human impacts.

Matthew Lawrence traveled to the NOAA Diving Center in Seattle, WA for training in the new NOAA science diver certification process. He is now authorized to administer the NOAA Science Diver training program.

Sanctuary staff were contacted by a relative of two of the steamship *Portland's* African American crew members, saloon man Arthur A. Johnston and stewardess Carrie E. Harris. The young man was conducting genealogical research and is a graduate school at the University of Kansas. Staff provided archival information on his relatives including copies of materials from the National Archives-northeast region.

The SBNMS YouTube site (developed and maintained by maritime heritage staff) has 319 subscribers. The top viewed video is a wolfish with over 36,045 views. There are currently 28 videos available on the site highlighting the sanctuary's maritime heritage and marine life. In total, the videos have been viewed 74,300 times. The website address is: <http://www.youtube.com/SBNMS>. Please subscribe.

The SBNMS Facebook page (developed and maintained by maritime heritage staff) has 561 fans, an increase of 128 subscribers since the previous update. Please become a friend by following this link <http://www.facebook.com/sbnms>

OPERATIONS AND SPECIAL PROJECTS: Ben Cowie-Haskell and Dave Slocum

*** VESSEL OPERATIONS**

The R/V AUK has performed well over the summer with no downtime due to mechanical failures. By the end of September the AUK will have over 60 days at sea logged.

*** FACILITY OPERATIONS**

Dave and Ben continued to work with the architectural team from the firm Black and Veatch on the renovations for the Marine Operations Center (MOC). The MOC is the final phase in the renovation of the Scituate campus where phase I involved the renovation of the Administration building and meeting annex and phase II involved the construction of the research vessel AUK. The MOC will significantly enhance the science capabilities of the sanctuary by providing a wet and dry lab, dive locker, boat repair shop, and space for visiting scientists.

The land for the overflow parking lot adjacent to the MOC was purchased in January 2011 with the help of the Army Corps of Engineers. Its purchase will enable full utilization of the MOC.

The bulkhead leading to the MOC was rebuilt in May/June. This was a high priority repair identified in the Appledore engineering assessment of 2007.

*** SPECIAL PROJECTS**

Ben and Leila Hatch, ecologist, were awarded \$62,996 to conduct a pilot project to deploy ocean acidification sensors in the sanctuary for several months on an experimental right whale auto detection buoy in the traffic separation scheme bisecting the sanctuary. This is a collaborative project involving the NE Fisheries Science Center, University of New Hampshire, Woods Hole Oceanographic Institution, University of Massachusetts, and the NE Regional Association of Coastal Observing Systems.

EXTERNAL AFFAIRS: Nathalie Ward

*** SANCTUARY ADVISORY COUNCIL**

There has been one Council recruitment this summer (November 1, 2011 deadline) to fill vacant 2 Council seats (2 Research Alternate seats), which represent the public's interests in sanctuary matters and provide advice to the sanctuary superintendent.

The SAC Charter was amended so that non-governmental members are appointed for a three-year term. Standing Subcommittees include: SAC Leadership Award Subcommittee, Youth Seat Subcommittee and Ad Hoc SERA Subcommittee (meeting 25 August, New England Aquarium, Boston). See attached SAC members contact list. (See Appendix I.)

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 cross-cut Council's communication.

The Council will participate in the **SAC CHALLENGE**, wherein SAC members plan an event, publication, education or research program, etc. to raise visibility of the sanctuary for SBNMS's 2012 20th Anniversary Celebration.

* SISTER SANCTUARY PROGRAM

Dominican Republic:

SBNMS's Sister Sanctuary (SS) MOU with Santuario de Mamiferos Marinos de la República Dominicana (SMMRD—Marine Mammal Sanctuary of the Dominican Republic)—first signed in 2006, will be renewed 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:

Nathalie has been working with the French Antilles to establish a sister sanctuary to protect humpback whales between SBNMS and Agoa's Marine Mammal Sanctuary since 2009. 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:

Additionally, 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. It is planned that the SS LOI with the Kingdom of the Netherlands will be signed and celebrated at the upcoming International Conference on Marine Mammal Protected Areas (ICMMPA0 in Martinique (November 2011). The sister sanctuary relationship 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.

Outreach for Sister Sanctuary:

SBNMS' work with Dominican sister sanctuary partners to design, develop and implement a Sister Sanctuary Exhibit—"International Citizens: Animals without Passports"—at the Natural History Museum in Samana Bay was completed in February 2011. 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

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

Nathalie Ward, External Affairs Coordinator, is preparing with ONMS International for the training of Dominican Republic government officials and NGO's for the development of a Management Plan for the Santuario de Mamíferos Marinos de la República Dominicana (SMMRD—Marine Mammal Sanctuary of the Dominican Republic). Under the auspices of the United Nations Environment Programme (UNEP, Nairobi) LifeWEB Programme, the 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 Samaná y su Entorno (CEBSE)}.

Eastern Caribbean: UNEP-Specially Protected Areas and Wildlife (SPAW) Regional Activities Center (Guadeloupe)

Additionally, Nathalie submitted a Sister Sanctuary Program grant, “The Grenadine Project”, to UNEP-Nairobi, which was awarded and will be administered by the UNEP-SPAW-RAC in Guadeloupe to support the international project.

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 to Caribbean interns in education and scientific research. This summer season the interns were from the Dominican Republic and Puerto Rico. Participants enhanced 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.

* 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.

* STELLWAGEN ALIVE!

Stellwagen Alive subcommittee and Nathalie held monthly conference calls met 18 October at the sanctuary to discuss future collaborative projects including the republication of *Stellwagen Bank: A Guide to the Whales, Seabirds and Marine Life of Stellwagen Bank National Marine Sanctuary* (by Nathalie Ward, Copyright Provincetown Center for Coastal Studies). Outcome pending.

* PUBLICATIONS

“An ecosystem approach to fisheries; Linkages with sea turtles, marine mammals and seabirds” in *Marine Ecosystem-Based Management in the Caribbean*. J.A. Horrocks, **N. Ward**, and A.M Sutton. Eds L. Fanning, R Mahon and P. McConney, amerstand University Press, Amsterdam, The Netherlands. 2011.

“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.

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 winter and spring of 2010-11. 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.

Integrating underwater noise within coastal and marine spatial planning frameworks: lessons from the Stellwagen Bank National Marine Sanctuary, **L.T. Hatch**, C.W. Clark, S.M. Van Parijs, A.Frankel, and D. Ponirakis. Acoustic Communication by Animals, 3rd International Conference. Cornell University, Ithaca, New York (Aug 2-5, 2011).

Outreach:

SBNMS worked with colleagues at NEFSC to finalize a permanent exhibit on ocean sounds in the NOAA Aquarium in Woods Hole drawing on products from research in the sanctuary.

The journal *New Scientist* published a story in June on ocean noise pollution, predominantly focused on shipping, which highlighted the work in the sanctuary

<http://www.newscientist.com/article/mg21028165.200-software-simulator-tracks-undersea-noise-pollution.html>

* 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 summer following their March meetings in Boston and in advance of the October meetings in Santa Cruz. 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.

* 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. The goal is to use this information to mine archived acoustic data collected in past years throughout Massachusetts Bay, including the sanctuary, for similar activity, potentially locating additional remnant spawning locations and guiding a more comprehensive listening effort in the future. An MARU was deployed from March through June 2011 near confirmed spawning activity and analysis was ongoing through summer 2011 detect spawning sounds. Results of analysis will be available in the fall and will guide development of plans for additional data collection in winter 2011-12.

* SANCTUARY/US COAST GUARD AUX WHALE WATCH DATA COLLECTION

Coordinated the 2011 season of US Coast Guard Auxilarists 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 Auxilarists 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.

In addition, manuscripts detailing results based on past tagging efforts in the sanctuary were published or are in press this summer.

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."

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**

Since winter 2010, the operation of the Northeast Gateway Deepwater Port has been under heightened levels of scrutiny due to an emergency maintenance and repair event and continuing violations of water usage permits by this port during its operations. As a result, consultations under the National Marine Sanctuary Act and Endangered Species Act were reopened in fall 2010, and additional environmental impact assessment remain underway to determine what the change in this port's operational conditions means for sanctuary and other NOAA trust resources. In addition to these higher-level consultation activities, SBNMS staff reviewed weekly reports throughout this period, and meetings were held with the companies environmental compliance teams to ensure mitigation criteria were implemented. 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 IPAD APPLICATION TO TRANSMIT REAL-TIME RIGHT WHALE DETECTION INFORMATION**

(Funding provided to D. Wiley and K. Schwehr by International Fund for Animal Welfare/IFAW)

The sanctuary has been promoting the development of methods to transmit the real time messages regarding right whales detected in the Boston Traffic Separation Scheme (TSS) for over two years now, and has developed partnerships with the University of New Hampshire's Center for Coastal and Ocean Mapping, Cornell University, DOI National Parks Service, the US Coast Guard Research and Development Center and others to install an AIS transmitter on Cape Cod. Through additional collaborative efforts with the International Fund for Animal Welfare and a company called "EarthNC" this project has migrated to creating an iPad application that could visualize these messages coming in via AIS offshore if ships had the infrastructure on board. This system is in its final stages of development with current plans for unveiling in September-October 2011. The system will be piloted by both LNG companies as well as an additional group of vessels utilizing the TSS to come into the Port of Boston.

*** 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 echosounder, 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.

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.

* ECOSYSTEM-SERVICES MODELING

The Massachusetts Ocean Partnership has funded two teams of researchers to model the ecosystem services provided by state and federal waters off the coast of Massachusetts. The National Center for Ecological Synthesis and Analysis (NCEAS) and colleagues on the west coast are funded to transition from the cumulative impacts assessment they completed to support the Massachusetts Ocean Plan towards ecosystem service modeling, and a second team on the east coast led by Boston University and the University of Vermont (Les Kaufman, Roelof Boumans, Joe Roman and others) is funded to utilize MIMES modeling to characterize ecosystem functions and evaluate tradeoffs among service provisioning. Team east is also focused on outreach/education, and is adapting a model called MIDAS developed by researchers at BU and colleagues to interact with the public and decision-makers regarding service tradeoffs. Because the sanctuary comprises a large portion of the pilot study area and the modeling being conducted addresses questions that are central to sanctuary management, SBNMS research staff have been offering logistical support, data and expertise to both projects. L. Hatch is now working with NCEAS, MOP and Massachusetts Coastal Zone Management on a publication relating cumulative impact assessment to SBNMS management context. The sanctuary is hosting a meeting organized by the Massachusetts Ocean Partnership to review the status of MIMES modeling effort on August 29th.

* SANCTUARY ECOLOGICAL RESEARCH AREA ANALYSIS

The NOAA Office of National Marine Sanctuaries (ONMS) proposes designating a Sanctuary Ecological Research Area (SERA) within Stellwagen Bank National Marine Sanctuary. A SERA designation would establish a dedicated research area to conduct studies that aid sanctuary managers and the public in meeting objectives focused on the conservation of marine biological diversity as well as afford an improved understanding of ecological processes linked to fishing in the SBNMS. The proposal required detailed spatial analysis of Fishing Vessel Trip Report (VTR) from 1996-2009, Fishing Vessel Monitoring System (VMS) data from 2006-2009, Massachusetts Ocean Partnership (MOP) Recreational Fishing Data, NMFS Observer Data and sediment classification from SASI and USGS for habitat suitability analysis, bathymetric data, and a detailed examination of existing fishery regulations and a socio-economic analysis. These analysis and findings were presented to NMS, NEFSC, NERO and the scientific community and will be released at the fall 2011 SAC meeting then a full delivery to the New England Fisheries Management Council in September 2011. The primary purpose of the proposed SERA is to establish reference and treatment subareas based on different types fishing to facilitate the

research and monitoring needed to better understand the dynamics and processes (biological and physical) that mediate patterns of biological diversity within the sanctuary.

* INCREASING THE SOCIAL POWER OF SCIENTIFIC INFORMATION USED FOR DECISIONS ON MARINE PROTECTED AREAS IN NEW ZEALAND (D. Wiley Ian Axford (New Zealand) Fellowship in Public Policy)

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.

Wiley, D.N. (2011) **Increasing the social power of scientific information used for decisions on marine protected areas in New Zealand**. Fulbright New Zealand. Pp. 72.

VOLUNTEER PROGRAM: Anne-Marie Runfola

*** Volunteer Program Brings Publicity and Support to the Sanctuary**

Anne-Marie Runfola joined SBNMS as a part-time volunteer coordinator in November 2010. To date, she has created six new programs and is currently piloting and evaluating them: Stellwagen Bank Sanctuary Ambassadors, *A Child's Sanctuary*, Stellwagen Bank Sanctuary Seabird Stewards (S4), Marine Mammal Observer Corps, Sister Sanctuary Exchange, and Program Internships. Anne-Marie recruited 28 new volunteers, held five training workshops, and is

currently coordinating 30 active volunteers who have given 1,200 hours to the sanctuary since November 2010. Anne-Marie is developing 30 additional potential volunteers who have applied, interviewed, and/or attended training. Four summer college interns joined the Volunteer Program this summer, giving a combined 700 hours in the areas of research, education and outreach and office support.

Together with her volunteer corps, the program has reached more than 700 people directly through outreach events and direct recruiting and several thousand more people indirectly through the web, press, and word of mouth. Anne-Marie worked with partner organizations and the press to generate seven news articles about the program and the sanctuary. Scituate residents—the program's first target audience—have indicated that since the Volunteer Program started, the sanctuary and its programs have been noticeably more visible in the community.

* RECENT PROGRAM HIGHLIGHTS

Ambassadors Extend Reach of Sanctuary from Cape Cod to North Shore

The sanctuary held its first training for twelve Stellwagen Bank Ambassadors, the sanctuary's new docent corps, on Saturday, May 14th, 2011. Ambassadors, from teens to retirees, have waved to crowds on a parade float, led educational activities at the local library, and promoted the sanctuary at six events from Boston to Cape Cod, reaching more than 600 members of the public in the last few months. The goal is to train Ambassadors to work in communities from Cape Cod to Cape Ann, to extend the reach of the sanctuary and support staff in their outreach and education efforts. Next, Anne-Marie will work with other SBNMS staff to cross-train volunteers who work in institutions with Stellwagen exhibits, such as the Irish Mossing Museum. The organizations will gain additional training for their volunteers, and these Ambassadors will be able to provide additional sanctuary content and interactivity at the exhibit sites.

Model Program Connects Community to its Sanctuary

Last winter, a talk with the Scituate children's librarian inspired Anne-Marie to produce *A Child's Sanctuary*, a series of educational events led by volunteers targeting pre-K through upper elementary school students. The program is designed to connect children and parents to their local sanctuary and offer science, math, art, and language arts content through a real-world context. Sanctuary staff trained the Stellwagen Ambassadors to present marine-themed activities, highlight library resources, and share information about Stellwagen Bank and the National Marine Sanctuaries program. In addition to adult volunteers, Anne-Marie developed a cadre of teen Ambassadors to help run the program by cross-training the library's youth volunteers. 160 parents and children participated in the three pilot events: Whales in Our Backyard, May 7th; Sanctuary Seabirds, July 9th; and Bottom of the Sanctuary, August 13th, 2011. The program generated six local news articles. Scituate Town Library was chosen as the featured library in a national blog, the Programming Librarian, because of its collaboration with SBNMS for *A Child's Sanctuary*:

<http://www.programminglibrarian.org/blog/2011/august-2011/featured-library-scituate-town-library.html>

Schools and other libraries have already approached Anne-Marie with requests to replicate the program. Volunteers will learn to run these events on their own, starting this fall. With proper resources, *A Child's Sanctuary* could travel to dozens of towns connected to the sanctuary, from Gloucester to Cape Cod.

Citizen Scientists Kick off Seabird Research in the Sanctuary

On July 26th, staffers Anne-Marie Runfola and Michael Thompson, and SAC member, Wayne Petersen of Mass Audubon, trained 15 experienced birders for the first Stellwagen Bank Sanctuary Seabird Stewards (S4) research cruise on August 2nd. Stewards counted 1,400 birds on the inaugural trip and will continue the pilot study with three more trips on the *R/V Auk* this year, including the annual Christmas Bird Count. Stewards will collect data on whale watch vessels this fall to gather additional information on seabirds in the sanctuary. In 2012, we plan to run at least five seabird cruises and deploy stewards weekly on whale watch vessels.

The overall goals of S4 are three-fold – to collect more baseline data on birds and related parameters; to educate the public about these lesser-known birds and their importance in the sanctuary; and to create a citizen science project in which we will train a group of volunteers as field naturalists, to develop their skills and potential job opportunities. Volunteers will post results on the global eBird database and on Massbird, the state listserve. We are coordinating with US Fish and Wildlife Service and NOAA National Marine Fisheries Service to share protocols, data and resources, and source funding to make this a long-term research project.





Photos: Anne-Marie Runfola, SBNMS; Evelyn Ganson, SBNMS Volunteer
Program Staff: Anne-Marie Runfola, Volunteer Coordinator

*** QUICK NUMBERS:**

Anne-Marie Runfola was hired as the Stellwagen Bank National Marine Sanctuary Volunteer Coordinator in November 2010. Funding for the position is part-time for one year. From November 2010 – August 2011, Anne-Marie has

- Created six new programs; currently piloting and evaluating them.
- Developed and held five training events for Ambassadors, Seabird Stewards and Child's Sanctuary.
- Recruited, trained and placed 28 new sanctuary volunteers. Currently coordinating 30 active volunteers who have logged 1,400 hours since November 2010.
- Developed an additional 30 potential volunteers who have applied, interviewed, and/or attended training.
- Hosted four Volunteer Program Interns who gave more than 700 combined hours this summer in the areas of research, education and outreach and programmatic support.
- Reached more than 1,700 people through volunteer programs, outreach events, recruiting and other direct contact. Reached several thousand more indirectly through the web, communications, and word of mouth from the direct contacts.

*** PROGRAMS**

Developed six volunteer programs to showcase ways to engage the community and develop support for the sanctuary mission, staff, and the National Marine Sanctuary Program: Stellwagen Bank Sanctuary Ambassadors, A Child's Sanctuary, Stellwagen Seabird Stewards (S4), Marine Mammal Observer Corps, Sister Sanctuary Exchange, and Volunteer Program Internships.

Program highlights:



SBNMS staff member, Michael Thompson, instructs volunteer marine mammal observer, Tori Knoss, to look for spouts and other signs that animals are near the vessel. The Dedicated Marine Mammal Observer program provides consistent support for research cruises to ensure crew steers clear of the mammals.

Photos: Evelyn Ganson for SBNMS.



Anne-Marie Runfola presents sanctuary information to Ambassador trainees. Some graduates will learn to give this presentation to schools, civic groups and at public events.

International Sister Sanctuary Workshop Focuses on Volunteerism



Photos: Anne-Marie Runfola, SBNMS

As part of our Sister Sanctuary partnership, Stellwagen Bank National Marine Sanctuary led a two-day workshop on March 4-5, 2011, *Planning and Managing Volunteer Programs*, in Samaná, the gateway to the Marine Mammal Sanctuary of the Dominican Republic. Stellwagen Bank Volunteer Coordinator, Anne-Marie Runfola collaborated with Barbara Knoss, Director of Education and Volunteers at the Cape Cod Museum of Natural History, a sanctuary education partner, to develop and lead the workshop for twelve participants from organizations such as the Samaná Tourism Cluster, the Mayor's Office, The Nature Conservancy, and CEBSE, a conservation organization that opened a whale museum in February. The workshop focused on developing a youth volunteer corps to educate locals and tourists about the sanctuary and its connections with Stellwagen Bank and the National Marine Sanctuaries program.

Ambassadors Extend Reach of Sanctuary from Cape Cod to North Shore

The sanctuary held its first training for twelve Stellwagen Ambassadors, the sanctuary's new docent corps, on Saturday, May 14th, 2011. Ambassadors, from teens to retirees, have waved to crowds on a parade float, led educational activities at the local library, and promoted the sanctuary at five events from Boston to Cape Cod, reaching more than 1,400 members of the public in the last few months. The goal is to train Ambassadors to work in communities from Cape Cod to Cape Ann, to extend the reach of the sanctuary and support staff in their outreach and education efforts. Next, Anne-Marie will work with other SBNMS staff to cross-train volunteers who work in institutions with Stellwagen exhibits, such as the Irish Mossing Museum. The organizations will gain additional training for their volunteers, and these Ambassadors will be able to provide more sanctuary content and interactivity at the exhibit sites.



Stellwagen Ambassador, Carol Apgar, invites local residents to learn more about the sanctuary.

Summer intern Ambassadors, Tori Knoss and Ali VanBaar, talk with visitors at the Woods Hole Climate Fair.

Photos: Anne-Marie Runfola, SBNMS.

*** Model Program Connects Community to its Sanctuary**

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Families map a shipwreck, fish for facts and handle a model of REMUS, an autonomous operated vehicle, during the “Bottom of the Sanctuary” themed event.

Photos: Evelyn Ganson for SBNMS



Children drive a remote operated vehicle, while learning how technology is used in sanctuary research and management.

Citizen Scientists Kick off Seabird Research in the Sanctuary



Stewards on the *R/V Auk* count seabirds during the inaugural cruise.
Photo: Evelyn Ganson for SBNMS.

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* OUTREACH—COMMUNICATIONS

- Created a volunteer fact sheet and web pages to feature the expanding volunteer program: http://stellwagen.noaa.gov/involved/vol_open.html. Content includes fact sheet, application, volunteer opportunities, events, and featured volunteers. Regularly creates content for SBNMS Facebook page.
- Wrote content, took photos, and communicated with journalists for PR/communications. Results: Three Scituate Town Library press releases re. A Child's Sanctuary; Three library flyers; six articles in local papers; one article and one photo in Boston Globe's boston.com; full page in Banknotes. Orchestrated article for Falmouth Enterprise. Result: three-quarter page article about SBNMS with photo and sanctuary map, featuring work of Nathalie Ward and the Sister Sanctuary Program, the volunteer program and the Marine Art Contest.

- Developed *A Child's Sanctuary* programming that was recently featured in a national blog on libraries: <http://www.programminglibrarian.org/blog/2011/august-2011/featured-library-scituate-town-library.html>
- Scituate residents—the program's first target audience—have indicated that since the Volunteer Program started, the sanctuary and its programs have been noticeably more visible in the community.

* OUTREACH EVENTS

- **Event Tabling/Booths:** Organized volunteer participation at five outreach events in New Bedford, Woods Hole, Mashpee, Scituate, and Boston. Five trained Ambassadors helped run the events, reaching an estimated 1,400 people.
- **Recruiting Event:** Hosted a booth at the Scituate Public Library Volunteer Expo with a volunteer on 3/2/11. Met with 30 people. Of the 12 people who joined our mailing list, six have applied for volunteer positions, and four have started working on projects. Applicants ranged from junior high school students to retirees with a variety of skills and experience.
- **Scituate St. Patrick's Day Parade:** Organized parade float and marched with five other staff members and six volunteers to remind the town that the sanctuary is in their backyard. Reached more than 15,000 viewers. Feedback from the community was overwhelmingly positive, with residents thanking us for our work and for taking part in the event.



* PROGRAM DEVELOPMENT—FUNDRAISING

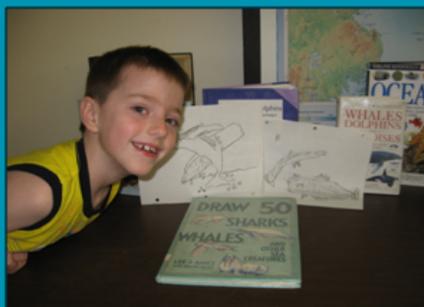
- Applied for a Toyota Education Foundation Every Day Grant and to the Blake-Nuttall Fund (pending 9/15/11). Working with US Fish and Wildlife (US FWS) and NOAA National Marine Fisheries Service (NMFS) to identify future funding. Developing proposal for 2012 with US FWS.

- Developed idea and pitch for Sponsor A Research Cruise; pitched to Jack Conway Realty.
- Pitched the Seabird Stewards Program to USFWS, NMFS, CUNY/Staten Island - BOEMRE, Francisco Nunez at TNC/Dominican Republic, and Mass Audubon.
- Researched hundreds of funding opportunities from local foundations to federal agencies. Working with a volunteer on developing prospects and proposals.

Scenes from *A Child's Sanctuary* events and volunteer training workshops.
 Photos: Anne-Marie Runfola, SBNMS unless otherwise noted.



Evelyn Ganson



Evelyn Ganson

EDUCATION AND OUTREACH: Anne Smrcina

*** PUBLICATIONS**

The spring/summer issue of *Stellwagen Banknotes* was printed and distributed in May. The issue contains a long feature story about the Helgoland underwater habitat that was used on Jeffreys Ledge in 1975. We have been receiving very positive feedback about the issue. Unfortunately, this will probably be the last printed, glossy *Banknotes* for the foreseeable future

as design and printing funds are not available in the next fiscal year. A notice to readers about the possible development of an on-line newsletter is generating a steady flow of email addresses. About 4,500 copies of the magazine were mailed out and 1,500 copies delivered to the office for distribution at exhibits, meetings and conferences.

A 2011/2012 issue of *Stellwagen Soundings* was printed in July and distributed throughout the region, including all whale watch companies, tourism centers along the coast, and exhibit sites. The sanctuary printed 60,000 copies, of which we expect to use 25,000 this year and the rest in 2012. The issue includes a feature story of recent whale research and a guide to sanctuary shipwrecks. Anyone interested in obtaining copies for distribution at locations around the sanctuary region should contact Anne.

* EXHIBITS

Renovations at the Gloucester Maritime Heritage Center were completed on schedule before the Memorial Day weekend. Work included new kiosks, new DVD units, and video picture frames in the two dioramas.

Work continues on the new NMSF Hollings Grant with Stellwagen Alive. The cell phone audio tour program will have sites along the entire coastline, with messages that cover sanctuary resources, research, local history, and resource protection. Design for the signage and securing locations are two priorities at this time. Messages have been drafted and are under review. The program will also develop smartphone websites (QR codes) for several of the audio tour stops, providing supplementary visual aids.

Work has begun on redesigning the Provincetown kiosk that sits on MacMillan Wharf. The sanctuary will utilize national design standards in developing the unit. At this time, the themes of the four panels are: 1) sense of place (map); 2) Provincetown – from whaling to watching; 3) biodiversity in sanctuary waters; shipwrecks.

The 2011 winning artwork from the annual Massachusetts Marine Educators Marine Art Contest has been framed (replacing the 2010 winners). The show (some 40+ pieces) will begin a regional tour, starting with the Provincetown Center for Coastal Studies. The theme of the contest was “Amazing Ocean Creatures of Stellwagen Bank National Marine Sanctuary.” Other locations that have reserved or requested the exhibit include the JFK Building in Boston, the Salem National Historic Site and the Cape Cod National Seashore Visitor Center. If you know of other venues that may be interested in exhibiting the art, please contact Anne. The 2012 contest will be announced in November or December.

* EDUCATION

The sanctuary’s cooperative fall four-week mini-course on marine careers with Massasoit Community College has been organized. The sessions will cover: vessel captain/crew; research support; marine law enforcement; and science writing. The sessions will be held in the sanctuary annex on Tuesday nights in November and will be free of charge. We are promoting these programs to high school guidance and science departments as well as the community colleges. Adult (lifelong) learners are also invited to attend.

The sanctuary and Cape Cod Lighthouse Charter School are working cooperatively to produce a Humans/Whales curriculum that will be piloted in the sixth grade during the spring. The interdisciplinary program will include science, math, social studies, art and language arts components. The program was made possible by an National Science Teachers Association Toyota Tapestry Grant, one of 50 distributed this year across the nation.

Anne offered two workshops at the National Marine Educators Association annual meeting, which was held in Boston in late June.

The sanctuary is organizing a spring 2012 semester course on Sanctuary Natural Resources with Massasoit Community College. The three credit course will be open to all University of Massachusetts students (and other college students or auditors by arrangement). The undergraduate course will be a non-lab science elective and offered at the Brockton campus. Teachers who take the course will be able to get PDPs (professional development points) for their recertification process. The course curriculum is now in development and awaiting acceptance by the college.

*** PUBLIC OUTREACH**

Anne represented northeast sanctuaries at an ONMS/NMFS media/communications meeting in the Florida Keys in late June. The purpose of the meeting was to explore avenues for greater cooperation and coordinated messaging between the two parts of NOAA.

Media communications over the past few months have included: 1) the release of press releases pertaining to the Bermuda Letter of Intent and the French Antilles sister sanctuary MOU; 2) coordination with NMFS on press releases regarding the marine art show in Gloucester and Whale SENSE; additional support materials regarding the release of whale research papers; and the development of a NOAA blog about the Crittercam research cruise.