

Olympic Coast National Marine Sanctuary's Advisory Council
Science Working Group
Interim Report
July 7, 2014

Science Working Group Members

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Recommendations and Actions

1. Wait for the results of ecosystem indicators under development for the Pacific Coast under the state's Marine Spatial Process, and evaluate their relevance for the sanctuary. Identify other habitat types or concerns relevant to the sanctuary that are not addressed by the state's effort, and consider additional indicators, as necessary.
2. Because condition reports are the tool used by the Office of National Marine Sanctuaries to evaluate and report on ecosystem health, the Science Working Group decided to focus its efforts on defining indicators, metrics, and information or data types and data sources relevant for each of the condition report topic areas.
3. Determine if the Science Working Group will assist with the updating of OCNMS' Climate Change and Ocean Acidification Science Needs document during the summer of 2014.

Purpose

The purpose of the Science Working Group (SWG) as identified in the group's Charter is to focus on two related issues:

1. Provide recommendations on OCNMS ecosystem health indicators, including indicator species to support evaluation outlined in the next generation sanctuary Condition Report
2. Provide recommendations for establishing OCNMS as a sentinel site in support of long-term monitoring for climate change and other purposes

These purposes were fused into a Mission Statement from the SWG's Charter: The Science Working Group will evaluate potential indicator species for ecosystem assessment and indicator

parameters for climate change for the outer Washington coast, with a goal of developing recommendations for monitoring programs in OCNMS.

Background

The SWG was identified as a priority in the Advisory Council's 2013 work plan and was established at the September 20, 2013 meeting to address strategies and activities in the OCNMS 2011 management plan.

- Strategy ECO9: Ecosystem Processes, Activity A: Evaluate indicator species identified by and currently used by OCNMS (e.g. in condition reports) and regional co-managers (e.g., monitoring).
- Strategy CLIM2: Sanctuary as Sentinel Site, Activity B: Work with the AC ...to help 1) develop a climate change research prospectus describing specific climate change research priorities for the sanctuary, and 2) identify marine chemical, physical, and biological indicators of climate change for monitoring.

These management plan strategies were developed in 2010-2011. Since then, other regional efforts were initiated to identify ecosystem indicators including 1) NOAA's Northwest Fisheries Science Center (NWFSC) through the Integrated Ecosystem Assessment (IEA) initiative, 2) the Puget Sound Partnership, and 3) Washington State in the context of coastal marine spatial planning (MSP). Of direct relevance to OCNMS, Washington State in May 2013 initiated a process to identify ecosystem indicators on Washington's Pacific Coast and contracted in 2014 with the NWFSC Ecosystems Science Division to lead this effort, which is expected to produce a suite of ecosystem indicators for Washington's Pacific Coast by June 2015.

Also, in the 2010-2011 timeframe, NOAA was developing a Sentinel Site Program (<http://oceanservice.noaa.gov/sentinelsites/>). Whereas our nation's system of national marine sanctuaries provide designated locations where research on climate change impacts to coastal and marine ecosystems could be centered, the Sentinel Site Program limited the scope and focus of initial efforts to the issue of sea level rise, and proceeded to designate five sites around the nation for this program. These sites are Chesapeake Bay, North Carolina, Northern Gulf of Mexico, Hawaiian Islands, and San Francisco Bay. While a direct linkage between NOAA's Sentinel Site Program and Office of National Marine Sanctuaries (ONMS) did not initially occur, ONMS continues to promote national marine sanctuaries as intensely studied and monitored areas and ocean observing sites where research should be supported and leveraged through collaborative efforts.

These developments steered the SWG from the specific activities identified in the OCNMS management plan toward the following efforts to support the purposes identified for the group.

1. Indicators and metrics for the next OCNMS Condition Report
2. Update of the OCNMS Science Needs documents, with particular focus on the Climate Change and Ocean Acidification document

Meetings

All SWG meetings were held as conference calls, which were held on October 31, 2013, January 22, and March 13, 2014. OCNMS staff provided context for discussions and distributed preliminary draft documents to facilitate discussion. In addition to information sharing and

comments provided via conference calls, review comments were also provided digitally by SWG participants and used by OCNMS staff to refine draft documents.

Indicator species and metrics for the next OCNMS Condition Report

Ecosystem indicators are empirically tractable metrics that serve as proxies for key attributes of natural and socioeconomic systems. “Empirically tractable metrics” means the indicators need to be reasonably easy or feasible to measure or monitor.

Key decision: The SWG determined that the most effective route toward indicator species identification for OCNMS is to wait for results from the state’s ecosystem indicators work being performed for coastal marine spatial planning and expand on those recommendations, as appropriate or necessary. The state’s effort uses an established and comprehensive process to evaluate indicators and is being conducted by regional experts in the field of marine ecosystem indicators (i.e., NWFSC). This process evaluates potential indicators using a suite of criteria. Indicators must be theoretically-sound, relevant to management concerns, respond predictably, sensitive to changes in ecosystem attributes and management actions, and understood by the public and policy makers. After indicators are identified through the state’s process, OCNMS can evaluate the recommendations and determine if any changes or additions are necessary to address the sanctuary area. For example, OCNMS may want to identify indicators for additional habitat types not addressed by the state’s process.

ONMS condition reports provide a summary of resources in each sanctuary, pressures on those resources, the current condition and trends, and management responses to the pressures that threaten the integrity of the marine environment. Four subject areas are addressed in condition reports - water quality, habitats, living resources, maritime archaeological resources. There are ecosystem indicators implied but not specifically identified as indicators in the standardized format for condition reports. These are:

- water quality – eutrophic conditions, human health, climate change-related alteration of water quality, other stressors
- habitats – integrity of major habitat types, contaminants
- living resources – biodiversity, non-indigenous species, keystone/foundation species, other key species
- maritime archaeological resources – integrity of maritime archaeological resources, hazards associated with these resources
- human dimensions – changing levels of human activities, changing influential drivers

Because condition reports are the tool used by ONMS to evaluate and report on ecosystem health, the SWG decided to focus its efforts on defining indicators, metrics, and information or data types and data sources relevant for each of the condition report topic areas. To accomplish this, the SWG reviewed each of the 17 questions to be addressed in the next OCNMS Condition Report and developed two matrix tables summarizing:

- metrics or indicators used in the 2008 OCNMS Condition Report
- suggested indicators for the next OCNMS condition report
- data sources for suggested indicators
- questions and comments relevant to each topic

One matrix table addresses all 17 condition report questions. The other matrix table focuses on the human dimensions, for which condition report questions ask “What are the levels of human activities that may adversely influence (insert subject area) and how are they changing?” These matrix tables are included as an appendix to this report. These tables should not be considered a final set of recommendations or consensus-approved product of the working group. It is acknowledged that these tables can be improved, expanded and refined in the future. Additional effort at this time seems unwarranted, however, because the next OCNMS Condition Report is not likely to be drafted for several years, perhaps not until the next update of the OCNMS Management Plan is scheduled. The compilation of information and issues in these matrix tables may be useful to inform research priorities for OCNMS and others involved in marine resource management and conservation on the outer coast of Washington state.

OCNMS Science Needs Documents

The Office of National Marine Sanctuaries (ONMS) Science Needs Assessment is an evaluation of the science and information requirements (capability, information, and products) of the ONMS as defined by the management issues facing each sanctuary in the National Marine Sanctuary System. ONMS provides a web interface where current science needs are defined for each national marine sanctuary (<http://sanctuaries.noaa.gov/science/assessment/>). These assessments are based on priorities and issues identified in a site’s management plan, condition report, and strategic science plan. The purpose of the ONMS Science Needs Assessment is to provide targeted information on the science requirements, to support science and management staff working to address these requirements, and to communicate these requirements to potential partners and interested organizations and individuals, particularly those in the research community. The ONMS Science Needs Assessment also provides information to federal, state, and local legislative officials interested in the management issues and science requirements at a given national marine sanctuary or monument.

For each national marine sanctuary, science needs assessment documents are built around priority management issues for which support and collaborations are necessary. For OCNMS, there are 2-page science needs assessment documents last updated in May 2010 for these topic areas: climate change and ocean acidification, deep sea coral and sponge communities, kelp forests, seafloor habitats, marine mammals and seabirds, and nearshore and intertidal areas.

The SWG has not discussed the OCNMS Science Needs documents in any detail. In March 2014, when the SWG held their last conference call, OCNMS was anticipating guidance from ONMS on updates to the Science Needs documents. In subsequent discussions, OCNMS committed to updating its Science Needs documents this summer, with a goal of having updated versions completed by the end of this fiscal year (i.e., before October 2014). In general, updating of science needs documents is an internal process led by the research staff at each sanctuary site. It may be feasible for the SWG to continue its efforts this summer and provide support for updating of the Climate Change and Ocean Acidification science needs document for OCNMS, which is consistent with Strategy CLIM2: Sanctuary as Sentinel Site, Activity B: Work with the AC ...to help 1) develop a climate change research prospectus describing specific climate change research priorities for the sanctuary, and 2) identify marine chemical, physical, and biological indicators of climate change for monitoring.