

Olympic Coast National Marine Sanctuary

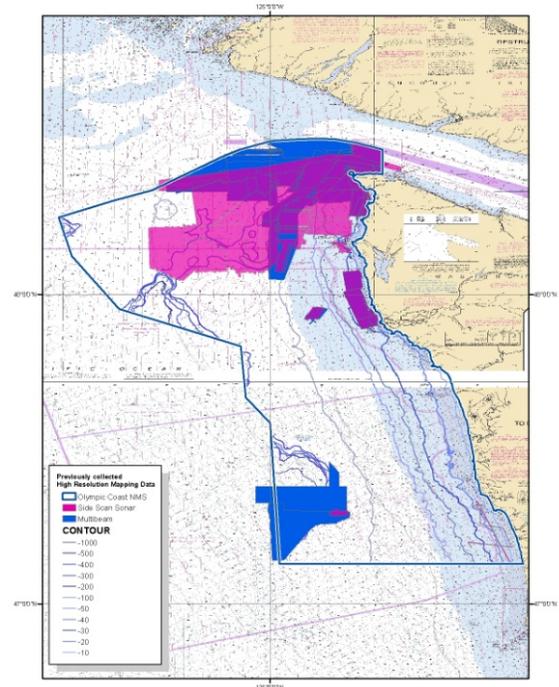
Mapping and Characterization of Seafloor Habitats

Management Issue

The Olympic Coast National Marine Sanctuary (OCNMS or Sanctuary) and its partners have made progress mapping seafloor habitats in the Sanctuary, but much work remains to be done. Since only 25% of the Sanctuary has been adequately mapped, there is a need to complete seafloor surveys and to characterize and identify species-habitat associations to effectively inform management decisions.

Description

The classification of habitats and general characterization of the seafloor are critical for supporting management, research, monitoring, and education within the National Marine Sanctuaries. Thus far, only 25% of the Sanctuary seafloor has been adequately mapped, and only 19% has been characterized to habitat type. Habitat mapping and characterization are high priorities for OCNMS, especially for recently discovered deep biogenic habitats that may be sensitive to anthropogenic disturbance. Mandates and needs for habitat mapping and characterization are highlighted in the National Marine Sanctuaries Act, the West Coast Governor's Ocean Action Plan, the Washington State Seafloor Mapping Workshop, and for groundfish fishery management plans (Pacific Fishery Management Council, NOAA Fisheries, Washington Department of Fish and Wildlife, Northwest Indian Fisheries Commission and Olympic Coast Intergovernmental Policy Council).



Colored polygons representing 25% of the acoustically mapped areas within Olympic Coast National Marine Sanctuary. Map credit OCNMS

Questions and Information Needs

- 1) What are the basic habitat types within the Sanctuary and how are they distributed spatially?
- 2) What is the bathymetric profile of the continental shelf, shelf break and associated submarine canyons in the Sanctuary?
- 3) Do we have biogenic habitat types at risk due to anthropogenic impacts? If so, where, and at what scale?
- 4) What is the degree of heterogeneity among habitat types and what is the ecological connectivity among specific habitat types?
- 5) What are the habitats association among species and how do these associations change spatially among continental shelf, shelf break and associated submarine canyons, and change temporally across seasonal, annual or decadal intervals? Do these habitats association change during the life history stages of a given species?
- 6) What are the spatial and temporal distribution and abundance patterns of species, and how are they organized into ecological communities and which habitat types are associated with high species diversity?
- 7) Can web-based GIS applications provide easy access to geo-located images, facilitating the use of this information by educators, managers and the interested public?

Current as of 9/16/2014

For More Information -- <http://www.sanctuaries.noaa.gov/science/assessment>

Scientific Approach and Actions

- Mapping technologies include side scan and multibeam sonar, as well as remotely operated vehicles (ROV) and autonomously operated vehicles (AUV).
- Post-process imaging data to create high resolution 3-dimensional renderings of the seabed in GIS format.
- Ground-truth substrate type and assess corresponding natural resources using benthic grab samplers or by video systems mounted on ROVs, AUVs or drop cameras.
- Compile a library of still images and videos
- Disseminate mapping data to partners and other user groups.

Key Partners and Information Sources

U.S. Geological Survey, NOAA Northwest Fisheries Science Center, NOAA Northwest Regional Office, NOAA Office of Coast Survey, NOAA National Centers for Coastal Ocean Science, State of Washington, Northwest Indian Fisheries Commission, Olympic Coast Intergovernmental Policy Council, Pacific Fishery Management Council and University of Washington.

Management Support Products

- High resolution maps can depict habitat characterization and identify critical habitat types.
- Associated GIS layers to natural resources such as the distribution and abundances of groundfish, invertebrates and biogenic structures.
- Associated GIS layers to map seawater parameters or oceanographic features such as surface temperature, upwelling fronts, current systems, or mesoscale eddies, as well as cultural resources, seabirds, marine mammals or primary productivity.
- Image or video libraries can also be geo-referenced to corresponding map locations.

Planned Use of Products and Actions

- Use habitat maps and natural resource overlays to assess environmental impacts such as oil spills.
- Use habitat data to move toward ecosystem based management and assist other resource managers. Develop recommendations assessing permits such as wave power, wind power or buried cables.
- Develop recommendations for marine protected areas or the protection of critical benthic habitats.
- Develop habitat suitability models.
- Develop web based systems to display geographically explicit data and images.
- Use maps as communication tools with general public for education and outreach.

Program References

OCNMS Management Plan Review

- Priority Topics C & E
- http://olympiccoast.noaa.gov/protection/mpr/mpr_prioritytopics.html

OCNMS Condition Report, 2008

- Questions 5, 6, 8, 10, 14

ONMS Performance Measures

- By 2015, 100% of the sanctuary system is adequately characterized.

Other Documents

- OCNMS Science Framework, 2003 <http://olympiccoast.noaa.gov/research/interested/welcome.html>)

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