Stellwagen Bank National Marine Sanctuary

Vessel Traffic

Management Issue

The quantity, types and movements of vessels in and around the Stellwagen Bank National Marine Sanctuary (SBNMS or Sanctuary) is unknown. These activities impact the Sanctuary in multiple ways including ship strikes to marine mammals, ocean noise, introduction of exotics, and pollutants.

Description

Understanding the quantity, size, temporal/spatial distribution, and cargo of vessel traffic in and around the Sanctuary is a key aspect of site characterization. Vessel traffic can relate to the risk of collision between vessels and endangered whales, the introduction of noise and exotic species, and water and air quality. The United States Coast Guard has designated the Sanctuary as an experimental site for using its Automatic Identification System (AIS) for scientific and management purposes. The Sanctuary has deployed an array of three receivers around the site to track vessels in real time and archive those data. The AIS also provides data on vessel length, draft, speed, cargo and numerous other attributes. The array is annually collecting over 150 million data points on ship descriptions and movement.

The Stellwagen Bank National Marine Sanctuary is heavily used by commercial vessels using the port of Boston, MA and other areas. Photo Credit: SBNMS

Questions and Information Needs

1) How many commercial vessels use the Sanctuary and how many transits of the Sanctuary occur?

2) What are the spatial/temporal patterns of vessel use in and around the Sanctuary?

3) What types of vessels use the Sanctuary and what are their cargos?

4) What are the trends in commercial shipping in and around the Sanctuary?

5) How can these data be used to inform policy decisions on issues associated with conservation and management of Sanctuary resources?

Scientific Approach and Actions

- Use the Sanctuary AIS array to collect continuous data on vessel movements and traffic patterns
- Create a database to support answering the above questions
- Combine these data with data from the Sanctuary's noise monitoring array to understand vessel contribution to ocean noise
- Combine these data with data from tagged whales to understand how whales move in 4-D relative to shipping

Key Partners and Information Sources

National Marine Fisheries Service, Cornell University, University of New Hampshire

Sanctuary Resources Available

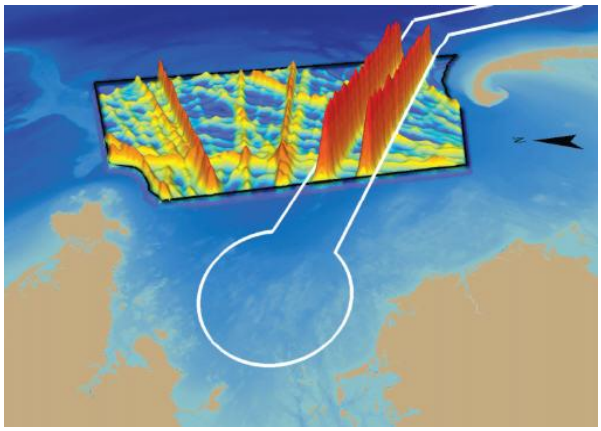
- AIS infrastructure including three receiving stations around the sanctuary
- GIS analysis

Resource Needs

- Financial support

Management Support Products

- Temporal and spatial maps of vessel traffic patterns by vessel type
- Visualizations of shipping input to ocean noise and calculation of Sanctuary noise budget
- Description of how whales move relative to ship approaches
- Identification of potential mitigation actions and the associated socioeconomic impacts



A 3-D depiction of vessel traffic patterns through the Stellwagen Sanctuary derived from AIS data. Map Credit: SBNMS

Planned Use of Products and Actions

- Inform stakeholder communities of findings
- Identification of potential impacts from shipping
- Work with appropriate partners to develop mitigation policies

Program References

SBNMS Management Plan,

(1.4) Develop a research program to better understand vessel interactions with whales.
(1.3) Determine the conservation benefit of reconfiguring the existing Traffic Separation Scheme (TSS) within the Sanctuary to reduce the risk of ship strike to whales.
(3.3) Investigate research strategies to determine responses of whales to approaching vessels.
(3.4) Conduct year-round monitoring to identify type, size, route and speed of vessels in the Sanctuary.

SBNMS Condition Report

- What are the levels of human activities that may influence living resource quality and how are they changing?

ONMS Performance Measures

- Expand observing systems and monitoring efforts within and near national marine sanctuaries to fill important gaps in the knowledge and understanding of ocean and Great Lakes ecosystems
- Investigate and enhance the understanding of ecosystem processes through continued scientific research, monitoring, and characterization to support ecosystem-based management in sanctuaries and throughout U.S. waters.