Gray's Reef National Marine Sanctuary

Habitat Change

Management Issue

Observations in Gray's Reef National Marine Sanctuary and at other live bottom areas in the South Atlantic Bight indicate that significant movement of sand occurs along the ocean bottom on a seasonal basis. In addition, wave action during significant storm events is likely to cause changes to hard bottom habitats and communities. Managers need to understand the impacts that sand movement and wave action have on the unique habitats and other resources of the sanctuary.

Description

Comparisons between the first comprehensive habitat classification (completed in 2001) and previous side-scan surveys of the sanctuary in the 1980s suggest that areas of low relief in the southeastern quadrant of the sanctuary have been buried by an influx of sand over time. The four bottom types found in Gray's Reef National Marine Sanctuary (GRNMS) have distinct physical and biological characteristics, therefore sand shifts could have significant impacts to communities within the sanctuary. The movement of sand alternately covers and exposes rock outcroppings that may in turn affect such parameters as community structure, ecological succession, biological productivity and erosion of the physical structure that supports the attached fauna. Likewise, storm events can cause scouring on the seafloor, detaching organisms from hardbottom habitats. A better understanding of sediment dynamics and the impact of storm events will enable GRNMS to determine how natural processes affect the structure and function of biological system.

NOAA diver documents coral, sponge, and algal cover of live bottom habitat. Photo credit: NOAA

Questions and Information Needs

1) How has the benthic habitat of GRNMS changed since the first benthic habitat classification was completed in 2001?

2) Are some areas of GRNMS more vulnerable to sand movement and storm events than others?

3) What are the sources of sand entering the sanctuary?

4) Where does sand shifting out of the sanctuary end up?

5) Are some species more/less vulnerable to changes in sand cover and storm events than others?

6) At what wave height and wave period are impacts to habitats observed?

7) How frequently do significant storm events occur?

8) What are the status and trends of key species in relation to sand movements and storm events?

Scientific Approach and Actions

- Determine aspects of potential sources and the transport, erosion and deposition rates of sedimentary materials

- Track significant storm events and monitor habitats to evaluate impacts from wave action.
- Determine how these factors may impact biological structure and function
- Develop and implement a sediment monitoring program
- Repeat habitat mapping and classification for GRNMS and conduct analysis of change since 2001 classification.

Key Partners and Information Sources

Skidaway Institute of Oceanography, NOAA's National Centers for Coastal Ocean Science, NOAA Ship *Nancy Foster*

Sanctuary Resources Available

- Two research vessels complete with captain and crew
- NOAA ship time
- Support staff for field operations and instrument deployment including science divers
- NDBC buoy located within the boundaries of GRNMS measuring atmospheric, oceanographic, and ocean acidification-related data (pH, CO_2, and noise)
- Habitat map
- Monitoring data

Resource Needs

- Financial support
- Partnerships for: grant application, project design, data collection and analysis, reporting, and monitoring

Management Support Products

- Scientific papers and reports
- Presentations for scientific meetings, workshops, symposia and conferences
- Education and outreach products to inform general public about research area issues and research results

Planned Use of Products and Actions

- Incorporate information about the impacts of sand movement into other relevant research areas
- Use information to help determine natural degradation of limestone substrates.
- Develop an annual and a five year report on the research area and provide to all interested parties
- Develop a five year review of the research area to augment management plan review process
- Develop education and outreach products to inform general public about research area issues and research results

Program References

GRNMS Management Plan

- Objective SR, Activity SR3B, Activity SR3D; Objective SR4, Activity SR4A and Activity SR4B

2008 GRNMS Condition Report and 2012 Addendum

- Question 5: What are the abundance and distribution of major habitat types and how are they changing?
- Question 6: What is the condition of biologically structured habitats and how is it changing?