

# Flower Garden Banks National Marine Sanctuary

## Status and Trends of Resource Condition

### Management Issue

The existing monitoring program at the Flower Garden Bank National Marine Sanctuary (FGBNMS or Sanctuary) needs to be modified to become more comprehensive in terms of the subject areas it addresses and the efficiency with which it does so.

### Description

Current monitoring focuses on coral and sponge cover, coral growth rates, fish diversity and relative abundance, and a limited suite of water quality indicators. A more comprehensive program, which would support a number of priority information needs for the Sanctuary, would include oceanographic measures, more water quality indicators (including contaminants in water, sediments, and living organisms, turbidity, and nutrients), climate change indicators (especially acidification), fish biomass and trophic structure, ciguatera occurrence, and the tracking of impacts of storms, coral bleaching, disease, and invasive species. It would also expand the surveys on the coral cap, as well as into deeper habitats than the coral reef alone and be conducted on banks outside the Sanctuary in order to compare condition and trends, and resilience.



*Diver using T-frame camera system at Stetson Bank to collect repetitive photostation image for annual analysis. Photo credit: Joyce and Frank Burek.*

### Questions and Information Needs

- 1) Are specific or multiple stressors, including changing oceanographic and atmospheric conditions, affecting water quality and how are they changing?
- 2) What is the eutrophic condition of Sanctuary waters and how is it changing?
- 3) Do Sanctuary waters pose risks to human health and how are they changing?
- 4) What are the levels of human activities that may influence water quality and how are they changing?
- 5) What are the abundance and distribution of major habitat types and how are they changing?
- 6) What is the condition of biologically-structured habitats and how is it changing?
- 7) What are the contaminant concentrations in Sanctuary habitats and how are they changing?
- 8) What are the levels of human activities that may influence habitat quality and how are they changing?
- 9) What is the status of biodiversity and how is it changing?
- 10) What is the status of environmentally sustainable fishing and how is it changing?
- 11) What is the status of non-indigenous species and how is it changing?
- 12) What is the status and condition of key species and how is it changing?
- 13) What are the levels of human activities that may influence living resource quality and how are they changing?

*Updated: 5/1/2010*

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

## Scientific Approach and Actions

- Increased frequency of sampling, i.e. seasonal sampling, for fish, benthic community, invertebrates
- Continue and implement NCCOS style random belt transects on a quarterly basis
- Initiate deepwater repetitive transects
- Sample for acidification indicators: pH and CO<sub>2</sub>
- Continue collection of photostations, and retake during bleaching events, or post-hurricane events
- Expand repetitive photostations to include *Madracis auretenra* fields to track impact and recovery
- Baseline heavy metal analysis
- Integration into SIMON style data portal
- Selection of a limited number of specific indicators best suited to answer the questions
- Appropriate statistical and sampling design to meet the spatial, temporal, and confidence needs Field sampling and in situ instruments
- Integrate remote sensing for oceanographic conditions
- Combine FGB and Stetson Bank monitoring efforts

## Potential Key Partners and Information Sources

Minerals Management Service; Reef Environmental Education Foundation; University of Texas Marine Science Institute; University of Texas at Austin; George Mason University; Food and Drug Administration (FDA); National Centers for Coastal Ocean Science; Commercial and recreational fishermen; National Marine Fisheries Service; Texas A&M Geochemical and Environmental Research Group; Harte Institute; Texas A&M University; National Centers for Coastal Ocean Science

## Management Support Products

- Recommended monitoring protocols
- Web-based information delivery system to coordinate input from partners (comparable to Sanctuary Integrated Monitoring Network (SIMoN) for west coast marine sanctuaries)

## Planned Use of Products and Actions

- Implementation of additional monitoring protocols and perhaps elimination of others
- Training partners, as appropriate, to collect, analyze, and deliver data
- Deliver monitoring information faster than in the past
- Use monitoring data to answer SWiM questions annually
- Prepare a comprehensive condition report every five years

## Program References

### FGBNMS Management Plan Review Process

- Public Scoping Reports

### FGBNMS Condition Report

- 1,2,3,5,6,7,9,10,11,12,13,14

### ONMS Performance Measures

- Number of sites in which habitat, based on long-term monitoring data, is being maintained or improved
- Number of sites in which water quality, based on long-term monitoring data, is being maintained or improved
- Number of sites in which living marine resources, based on long-term monitoring data, are being maintained or improved

### Other Documents

- 2004 ONMS Science Needs Assessment

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