

BOEM ENVIRONMENTAL STUDIES PROGRAM: ONGOING STUDIES

BOEM OCS Region: [Gulf of Mexico](#)

Planning Area: Western

Title: Long-Term Monitoring at the East and West Flower Garden Banks, Gulf of Mexico (2009-2013) (GM-09-02)

Total Cost: \$375,600.00

Period of Performance: FY 2009-2014

Conducting Organization: NOAA Flower Garden Banks National Marine Sanctuary

BOEM Contact: [James Sinclair](#)

Description:

Background: The Flower Garden Banks (FGB) are two seafloor mounds approximately 110 miles southeast of Galveston, Texas. These are the largest topographic features on the continental shelf of the northern GOM, with thriving coral reefs covering over 350 acres.

This is a continuation of a series of previous monitoring efforts begun in 1988 to develop a long-term database related to the environmental health of the east and west FGB. Costs of the monitoring have been shared with the NOAA Flower Garden Banks National Marine Sanctuary (FGBNMS) since 1996; each agency currently provides one half of the funding (total above reflects only BOEM contributions). Oil and gas activity in the area has continually increased in recent years. This study is important to validate and to sustain our contention that BOEM lease stipulations provide effective mitigation of impacts to the offshore environment in general and to these sensitive and unique biological features. The East and West FGB have received an increasing variety of protective special area designations including the following:

National Marine Sanctuary (NOAA National Ocean Service) and is defined as a Marine Protected Area (MPA);
Coral Habitat Area of Particular Concern (HAPC) for Essential Fish Habitat (EFH) (NOAA Fisheries); and
Special Ocean Site (SOS) (Environmental Protection Agency).

Objectives: This effort will continue the long-term monitoring at the East and West FGB to detect any subtle, chronic effects from natural and man-induced activities that could potentially endanger community integrity.

Methods: This study will be conducted jointly by the BOEM and the FGBNMS through an Inter-Agency Agreement. The FGBNMS will conduct the work from their office

using their dedicated research vessel. The monitoring will be consistent with past BOEM topographic features monitoring, as well as the previously required lease stipulation monitoring for activities located within the old 1-mile zone of the FGB (now a 4-mile zone is in effect). Techniques are similar to most other coral reefs monitoring studies. Observations shall be made to evaluate coral community health. Continuously recording water quality instrumentation was added to the ongoing study in 2001. These instruments will be maintained and data analyzed for a variety of water quality parameters.

Study sites of 100m x 100m were established in 1988. There are two sites, one at the East Flower Garden Bank (EFGB) and one at the West Flower Garden Banks (WFGB). The following methods are used to measure community health on each of the banks.

1. Random Transects: sixteen transects of 10 m length are located in a stratified random manner with four transects randomly located in each quadrant of the study site. Sequential images are analyzed along the length of the transect.
2. Repetitive Quadrats: forty photographic stations are permanently located in each study site. In addition, nine deep stations are located adjacent to the EFGB study site in depths from 110 to 130 feet. Photographs cover eight square meters.
3. Lateral Growth Stations: sixty permanent stations are located in each study site for photography of lateral encrusting growth of the coral *Diploria strigosa*. Photos are compared with the previous year to measure the amount of lateral growth.
4. Accretion: sclerochronology is used to measure the thickness of accretion on the reef bi-annually. We take cylindrical cores of the coral *Montastraea faveolata*, cut thin slices, and x-ray them to highlight the layers of varying density. This allows measurement of vertical growth from one growing season to the next.
5. Video and Invertebrate transects: two belt transects of 2 m x 100m length are surveyed visually and with video at each study site. Visual surveys are done for sea urchins and lobsters. Video surveys are for characterization of the general health of the reef and for incidence of disease.
6. Twenty-four stationary fish surveys are performed to estimate community composition, density, and size.
7. Water Quality: data logging instruments are placed on each bank to record water quality parameters over time. Quarterly water samples are taken at three depths on each reef.
8. Qualitative observations of general health, disease, and change in the reef add to the assessment.

For a full description of past methods, see OCS Study [BOEMRE 2010-052](#) and [BOEMRE-2010-053](#).

Products: Quarterly reports, water quality data, data files, photos, videos, an interim report, and a final report

Importance to BOEM: The BOEM tracks the health of the (FGB) reef to detect natural changes in the ecosystem and identify any anthropogenic effects that could be caused by

oil and gas activities. Ongoing monitoring at the FGB is important to validate and to sustain our contention that the lease stipulations provide effective mitigation of impacts to the offshore environment and particularly, these sensitive and unique biological features.

Current Status: Interagency Agreement in place. Field monitoring for 2009, 2010, and 2011 completed. Funding for refurbishment and mapping of site markers and sampling stations approved and in process for funding.

Interim Report Due: September 2012

Final Report Due: June 2014

Publications: none

Affiliated WWW Sites: [Flower Garden Banks Study Reports](#)
[Flower Garden Banks Information Page](#)

Revised date: March 2012

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