



## **Flower Garden Banks National Marine Sanctuary**

### **Research and Science Interpretation Summary**

**2010**

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#### **A. OVERVIEW**

The purpose of this document is to report the activities of the Flower Garden Banks National Marine Sanctuary (FGBNMS) Research Team during Fiscal Year 2010 (FY10).

#### **B. SUMMARY**

The FGBNMS research team was involved in 7 research and response cruises in 2010 field season, at a value of approximately \$130K for ship time, all of which came directly out of the FGBNMS FY10 budget. It is expected that a portion of this will be recovered through Deepwater Horizon funds. A pool of 29 sanctuary personnel, scientists, and reciprocity divers conducted approximately 425 SCUBA dives during the 2010 field season. Activities included biological surveys and sample collection, response activities related to the Deepwater Horizon oil spill, equipment maintenance, and image collection. Six sanctuary permits and three amendments were processed, and an additional eight are ongoing.

A significant amount of resources were directed towards the response to the Deepwater Horizon blowout, which occurred April 20, 2010.

All NOAA ship time was lost due to Deepwater Horizon Oil Spill Response activities.

It is important to note that a significant number of research cruises were taken off the schedule due to lack of funding, and/or vessel repairs. Primarily, only monitoring activities and oil spill response cruises were conducted. Research related to monthly data collection, grouper spawning aggregations, and mesophotic zone investigations succumbed to budgetary constraints.

## **C. CRUISES**

Cruises on board the R/V MANTA beginning in 2010 were crewed by Captain Darrell Walker – Bluestar Marine. The FGBNMS Research Team recognizes the crew for their enthusiasm and professionalism, and credits them and the R/V MANTA for the year's successful cruises. Unfortunately several major (manufacturer) engine difficulties were encountered and disrupted the cruise schedule.

### **1. DFH14 – ROV CRUISE**

#### **R/V MANTA**

**MAY 17-21, 2010**

FGBNMS partnered with NCCOS, COIERT, and UNCW to conduct quantitative ROV surveys in the deepwater and coral cap habitats. These surveys were in support of the management plan review, and the proposed research area. The R/V MANTA departed from the TAMUG dock on the evening of Sunday, May 16<sup>th</sup>. A smooth ride with flat seas put the ship at East Flower Garden Bank early on the morning of the May 17<sup>th</sup>. The first day of operations saw glassy flat seas, which gradually picked up, reaching 3-4 feet by Friday morning. Flat seas encountered on Monday allowed the R/V MANTA crew to observe two hammerhead sharks, a manta ray, and two unidentified surface swimming sharks from the back deck. Two full days were spent running transects at East Flower Garden Bank before the ship moved to West Flower Garden Bank on Wednesday. Two full days were spent running transects at West Flower Garden Bank. The morning of Friday, May 21<sup>st</sup>, was spent conducting coral reef cap transects at both East and West Flower Garden Banks.

### **2. DEEPWATER HORIZON OIL SPILL RESPONSE – SPMD DEPLOYMENT CRUISE #1A**

#### **R/V MANTA**

**JULY 30-31, 2010 (\$10,000)**

The FGBNMS research team installed initial semi-permeable membrane devices (SPMDs) at Sonnier, East (EFGB) and West Flower Garden Banks (WFGB), and Stetson Bank as part of an ongoing response to the Deepwater Horizon Oil Spill. Sediment samples were also collected as part of the effort. While we were out, we downloaded the Seabird instruments at EFGB, WFGB, and Stetson Bank – these instruments record temperature and salinity at depth. Water temperature was 84F at depth, except for Stetson Bank, which was 82F. Visibility ranged from 60-90 feet horizontally. A golden smooth trunkfish was sighted at Sonnier Bank, and a 5-foot female manta ray was seen at WFGB. At least 7 fishing vessels stopped by Stetson Bank while we were there during the morning. There was a green layer of brackish water (29ppt on the surface) for the top 20 feet at Stetson Bank, and the mooring lines were covered in amphipods. The divers were loaded with tasks, so unfortunately no photographs were taken.

### **3. STETSON BANK LONG-TERM MONITORING**

**R/V MANTA**

**AUGUST 8-12, 2010**

The FGBNMS research team and TAMUG and Moody Gardens AAUS reciprocity divers conducted the 21<sup>st</sup> Stetson Bank Long-Term Monitoring data collection effort. 38 stations were located and photographed, and 7 new stations were established. A shrimp trawler, *Miss Winnie*, tied up to a buoy as we arrived. Atlantic spotted dolphins were foraging around the vessel. Divers heard dolphins underwater later during the trip. The green layer at the top 20' was again present – 31ppt. Seas were calm, and warm (84F), with excellent visibility up to 100 feet. Large schools of spadefish, vermillion snapper, cottonwick, rainbow runners, Spanish mackerel, and yellowtail snapper were noted. A 3-foot female loggerhead head was observed both on the surface, and at depth, by divers. A scorpionfish was photographed with a rockhind sticking out of its mouth. A piece of shrimping net was retrieved off the reef.

### **4. FGBNMS LONG-TERM MONITORING**

**R/V MANTA**

**AUGUST 15-19, 2010**

The FGBNMS research team, BOEMRE divers, and TAMUG AAUS reciprocity divers conducted the data collection cruise for FGBNMS Long-Term Monitoring. The cruise was cut short due to high currents at West Flower Garden Bank (WFGB). Data collection was completed at East Flower Garden Bank (EFGB). A thermocline was noted at mid-water – it was 84F on top, and 80F on bottom, although this changed through the week. Visibility ranged from 50-70 feet at EFGB. Corals looked healthy, although some false bleaching was noted. Multiple mantas were reported at EFGB by the divers. A bright orange algae was very noticeable, and was collected and sent to Dr. Suzanne Fredericq for sequencing. We attempted WFGB tasks, but were thwarted by heavy currents and had to abort activities and return to shore. A loggerhead sea turtle was seen on the surface, and a large tiger shark was encountered by divers underwater.

### **5. DEEPWATER HORIZON OIL SPILL RESPONSE – NRDA CRUISE #2A**

**R/V MANTA**

**AUGUST 22-26, 2010**

The FGBNMS research team and TAMUG AAUS reciprocity divers conducted fish and benthic surveys at Sonnier and Stetson Banks as part of the ongoing Deepwater Horizon oil spill response effort. A longliner was on site with gear in at Sonnier Bank when we arrived. The SPMDs were retrieved and a new set were deployed at both sites. Sediment samples were collected. There was a very hazy low visibility layer at the top 30 feet of water – only about 10 foot visibility – low salinity at 28.6ppt. Water temperature at Sonnier was 84F on the surface and 79F on bottom. Divers had close encounters with a couple of 7-8 foot sandbar sharks. A 7 foot bottlenose dolphin buzzed divers on the ascent line. There was very little benthic cover on the 80 foot peak, but was quite lush benthic cover at the smaller 60 foot peak – dominated by sponges. A couple of invasive cup coral colonies (*Tubastraea coccinea*) were photographed on the 80 foot peak. At Stetson Bank the water temperature was 86F on bottom – and the fire coral, *Millepora*

*alcicornis*, was beginning to bleach. A rehabilitated hawksbill sea turtle was released at Sonnier Bank. This animal was stranded on a Texas beach entangled in onion sack. The turtle was rehabilitated by NOAA Fisheries Galveston Laboratory Sea Turtle Program in partnership with the Sea Turtle Stranding Network.

## **6. CORAL SPAWNING CRUISE/NRDA CRUISE #2B**

### **R/V MANTA**

**AUGUST 29 – SEPTEMBER 1, 2010**

The FGBNMS research team hosted ONMS Director Dan Basta and NOAA NRDA lead Tom Moore for the annual coral spawning event. University of Texas researchers, Sarah Davies and Eli Meyer were also along to conduct coral spawning studies. The corals spawned as predicted, spectacularly. Several manta rays were photographed and added to the catalog, and two species of sea turtle were encountered during the dives – *Caretta caretta*, and *Eretmochelys imbricata*. Deep long-term monitoring photostations were retagged and photographed at East Flower Garden Bank. SPMDs were retrieved, and replaced at East and West Flower Garden Banks, and sediment samples were collected as part of the ongoing Deepwater Horizon Response effort. UT researchers collected gametic material to assess ability to settle on various crustose coralline algae cues. The cruise finished up with a dive on HIA389A, the gas platform within sanctuary boundaries at East Flower Garden Bank.

## **7. FISH AND BENTHIC SURVEYS – CRCP/NCCOS/FGBNMS**

### **R/V MANTA**

**SEPTEMBER 7-13, 2010**

The FGBNMS research team, HBOI/FAU, CRCP, and NCCOS joined together to conduct fish and benthic surveys at East and West Flower Garden Banks as part of the proposed research area as directed by the Management Plan Review process. Water samples were collected as part of the long-term monitoring program. The beginning of a severe bleaching event was documented. Bleaching species included *Millepora alcicornis*, *Montastraea cavernosa*, *Siderastraea siderea*, and *Montastraea franksi*. Several manta rays were encountered and photographed for addition to the catalog. The surveys were conducted at randomly selected locations, and provided divers an opportunity to see parts of the reef rarely visited. The divers conducted a reconnaissance dive at HIA389A, before leaving East Flower Garden Bank. They also conducted a dive at Stetson Bank on their return to Galveston. Visual observations suggested 99% of the fire coral (*Millepora alcicornis*) was bleached. Mardi gras wrasse (*Halichoeres bureki*) were observed at both West Flower Garden and Stetson Banks. Water temperature was 88F at depth.

## **ADDITIONAL R/V MANTA CRUISES**

The R/V MANTA was chartered by the following user groups during the 2010 research season.

**1. TAMUG - BUCH 2011/1  
JUNE 5-6, 2010**

TAMUG reciprocity scientific divers conducting training activities on board the R/V MANTA. The divers practiced conducting fish identification surveys. Select divers are utilized for FGBNMS research and monitoring activities.

**2. TAMU – DiMARCO Cruise 2010/1  
JUNE 13-16, 2010**

FGBNMS Research Vessel R/V MANTA conducted an oceanographic research cruise in the northwestern Gulf of Mexico to estimate the areal extent and vertical distribution of dissolved oxygen concentration and hydrographic properties. This cruise was cut short due to engine problems. The crew was commended for facilitating as much data as possible regardless of the challenges.

**3. TAMU – DiMARCO Cruise 2010/2  
AUGUST 2-7, 2010**

FGBNMS Research Vessel R/V MANTA conducted an oceanographic research cruise in the northwestern Gulf of Mexico to estimate the areal extent and vertical distribution of dissolved oxygen concentration and hydrographic properties.

**4. TAMUG – DELLAPENNA Cruise 2010/1  
September 23-27, 2010**

Graduate students from the Dellapenna lab conducted mapping activities offshore from Galveston, Texas.

**D. ADDITIONAL SCIENCE ACTIVITIES**

1. Long Term Monitoring data processing
2. Deepwater Horizon Oil Spill Response
3. Permitting
4. Cruise planning – R/V MANTA support
5. Coordination of SCUBA operations
6. Coordination of shipboard research equipment and activities
7. NOAA fleet shiptime requests and needs
8. Regional GIS support
9. Science presence at SAC meetings
10. Compilation of Reel Report fishing activities
11. Participation in NOAA Deep Sea Coral calls
12. Announcement of FGBNMS Research Specialist position
13. Integration of lionfish early warning system into oil and gas program through SERPENT program.

14. Initiation of project: Deepwater sponges of the Flower Garden Banks NMS. Identification of sponge samples collected in deepwater investigations using ROV – FGBNMS/Christi Savarese/Smithsonian

Outside researchers:

TAMUG researchers documented the most westerly sighting of invasive lionfish, *Pterois sp.*, at Sonnier Bank on September 12, 2010. Texas A&M University - Galveston researcher Lynne Wetmore discovered two lionfish on Sonnier – one on each peak. Several more were collected on subsequent missions to remove the fish. For more information on this sighting visit <http://www.tamug.edu/rooker/newspress.html>.

EPA researchers and GA Tech research, Tonya Shearer, led a research expedition on the R/V BOLD to conduct assessment of the coral reef caps of the East and West Flower Garden Banks, as well as surrounding reefs and banks and oil and gas structures. One main focus was to document and collect the invasive orange cup coral, *Tubastraea sp.* Multiple colonies were collected from both the East and West FGB, as well as other survey sites.

#### **E. SCIENTIFIC INTERPRETATION/OUTREACH/MANAGEMENT ACTIVITIES**

1. Development and implementation of FGBNMS Facebook page
2. Continued NCDDC mapping tool website upgrades
3. Development of FGBNMS video highlights including id's and music
4. Held discussions with research and conservation community in Holbox, Mexico, relating to future collaboration and protection of whale shark resources and populations.
5. Participation in Ocean Discovery Day
6. Input into DEIS development for MPR
7. Contribution to digital slide catalog/library
8. Initiation and participation in Galveston's ArtWalk
9. Development of PowerPoint presentations for various events
10. Provided significant content for Sanctuary website
11. Presentations: Laurel Mountain Elementary School, Patton Elementary School
12. Conducted three SKYPE interviews with GirlStart, out of Austin, Texas.
13. Participation in Capital Hill Oceans Week (CHOW)

#### **F. CONFERENCES, MEETINGS, PRESENTATIONS, TRAINING, ETC.**

1. February 8-11, 2010. ONMS/NMFS Regional Summit, Miami, FL. Hickerson, Schmahl.
2. April 19-23, 2010. Research Coordinator's Meeting, North Carolina. Hickerson.
3. June 8-10, 2010. Capital Hill Oceans Week. Hickerson, Schmahl.

4. June 23, 2010. Trinationl Gulf of Mexico Summer Management Summit. Corpus Christi, TX. Hickerson.
5. August 2-5, 2010. NOAA/MATE remote sensing GIS workshop. Monterey, CA. Nuttall.

## **G. FUNDING**

Submitted successful CRCP proposal with NCCOS and CI for baseline surveys to be conducted in preparation for a proposed research area.

## **H. NEW SANCTUARY BIOLOGICAL RECORDS**

*Phyllangia pequegnatae* Cairns, 2000

## **I. PUBLICATIONS**

Zimmer, B., L. Duncan, R.B. Aronson, K.J.P. Deslarzes, D. Deis, M. L. Robbart, W. F. Precht, L. Kaufman, B. Shank, E. Weil, J. Field, D.J. Evans, and L. Whaylen. 2010. Long-term monitoring at the East and West Flower Garden Banks, 2004-2008. Volume I: Technical report. U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Regulation, and Enforcement, Gulf of Mexico OCS Region, New Orleans, Louisiana. OCS Study BOEMRE 2010-052. 310pp.

## **J. RESEARCH AND SCIENCE PARTNERSHIPS**

- Bureau Ocean Energy Management, Regulation and Enforcement (BOEMRE)
- Cooperative Institute of Ocean Exploration, Research and Technology (CIOERT)
- Harte Research Institute for Gulf of Mexico Studies
- National Centers for Coastal Ocean Science (NCCOS)
- National Coastal Data Development Center (NCDDC)
- Smithsonian Institute
- Texas A&M University (TAMU)
- Texas A&M University – Galveston (TAMUG)
- Texas A&M University - Corpus Christi (TAMU-CC)
- University of North Carolina – Wilmington (UNCW)
- University of Texas
- Wildlife Conservation Society (WCS)

## **K. RESEARCH STAFFING**

1. Emma Hickerson, Research Coordinator
2. G.P. Schmahl, Sanctuary Superintendent
3. John Embesi, Research Specialist
4. Marissa Nuttall, Research Assistant
5. Ryan Eckert, Research Intern

R/V MANTA crew:

1. Captain Darrell Walker
2. First Mate Michael Shetler

FGBNMS NOAA Divers:

1. Kelly Drinnen
2. Ryan Eckert
3. John Embesi
4. Tracy Hamburger (until July 2010)
5. Emma Hickerson (Unit Diving Supervisor)
6. Marissa Nuttall (as of January/February, 2011)
7. G.P. Schmahl
8. Michael Shetler (as of January 2011)
9. Darrell Walker (as of January 2011)
10. Marc Weekley (as of July 2010)