



# GRAY'S REEF NATIONAL MARINE SANCTUARY SANCTUARY PROGRAM REPORT



## VOLUME 3, NUMBER 3

A report for the Sanctuary Advisory Council and Sanctuary Constituents

Reporting period: July-October 2009

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## VOLUNTEERS

Administrative and Volunteer Coordinator Jody Patterson has begun development of new Gray's Reef volunteer programs. One program is aimed at encouraging youth to become watershed stewards and increasing public awareness of the marine environment through teacher-led, action based extracurricular groups (Gray's Reef Eco-Ambassador Teams- G.R.E.A.T.). The G.R.E.A.T. pilot program will be hosted by two local elementary schools that will implement school or community based projects while making a commitment to the protection and conservation of local watersheds.

## EDUCATION AND OUTREACH

### CoastWeeks Underway

CoastWeeks 2009 marks the 28<sup>th</sup> annual celebration of our nation's coastal, marine, and estuarine environment. This year's events run from September 16 through October 31 and include the popular Skidaway Marine Science Day (October 10) and CoastFest in Brunswick (October 3), hosted by the Georgia Department of Natural Resources. Planning and outreach for CoastWeeks is provided by the Georgia Coastal Education Group, a partnership of state and federal agencies that educate the public about the importance and value of Georgia's coastal and marine resources.



Gray's Reef's Gail Krueger led production of the events brochure.

*Instructing ROV operators, Skidaway Marine Science Day*

### International ROV Competition

Education Coordinator Cathy Sakas

supported Georgia Tech Savannah Campus students in their ROV program. While the team from Georgia Tech finished only 18<sup>th</sup> overall in the MATE ROV International Competition held in Massachusetts June 27<sup>th</sup>, they captured first place in the design component of the competition.



### **Fish Tagging Exhibit Opens at MECA**

Gray's Reef was invited to enrich the Marine Education Center and Aquarium's exhibit offerings with a display on the sanctuary fish tagging project. A mock acoustic receiver was placed in the Gray's Reef tank and spaghetti tags were attached to several fish in the tank. An acoustic tag is also on display. Two panels of text and photos explain the tagging process and the research it supports. The panels can be updated as more data comes in.

### **Rivers to Reefs a Success**

Two Rivers to Reefs Educators Workshops were conducted this year. The workshops were led by Cathy Sakas and Kim Morris-Zarneke of the Georgia Aquarium. Educators competed with 147 applicants for this year's coveted slots. The groups studied and followed the Altamaha River Watershed that begins in Atlanta and wends its way through the middle of Georgia to the coast. Due to limited fiscal resources this year, the teachers were not able to go off shore to actually be in Gray's Reef and to see it via a remotely operated vehicle. Instead, more time was spent exploring NOAA Sapelo Island National Estuarine Research Reserve, Gray's Reef's close partner.

The educators teach students ranging from kindergarten to advanced placement high school biology and chemistry. Each participant completed water quality profiles at ten stations along the watershed that included tests for pH, conductivity, phosphorous, nitrogen and dissolved oxygen. They learned how to deploy Niskin bottles, Secchi disks, plankton tows and trawl and cast nets. They experienced the watershed in a variety of ways that included canoeing, trawling from small boats, crawling through a marsh and walking a beach at night searching for nesting Loggerhead sea turtles. They heard from numerous presenters who live in and work with a particular link in the watershed chain. All were enthusiastically pumped up by the end of the pleasantly exhausting week. They are charged with developing lessons based on their experiences that will be posted to websites for other educators to use.

### **Dolphin Monitoring Program**

Cathy Sakas met with staff of NOAA NOS Ocean Media Center and NMFS Protected Resources to discuss the dolphin monitoring project taking place in the Brunswick, Georgia area. The project is following up on the discovery of extremely high levels of contaminants in the tissues of Bottlenose dolphins from this area. The source of the toxins is most likely from four sites that were shut down in the last decade due to illegal disposal of toxic waste products. Researchers were alerted to the potential problem when several new born calves were found dead. Recent studies indicate that the first born of a new mother dolphin transfers toxins in her body through the placenta to her fetus. The first born calf receives such a high concentration of contaminants that it rarely is able to survive beyond birth. The editor from Ocean Media Center is using Gray's Reef footage in this program and will share a DVD of it when completed.

### **Oral History Project Underway**

Cathy Sakas is working with NOAA NMFS partner Dr. Dionne Hoskins (Savannah State University) and Sapelo Island National Estuarine Research Reserve as well as several local African-American high school students to begin a collaborative oral history project. The first phase was to interview Sapelo Island native islanders who worked with Dr. Milton B. (Sam) Gray, who conducted early studies on Gray's Reef.

### **Dive Poster Now Available**

Staff created a Gray's Reef best diving practices poster for distribution at dive shops. The poster utilizes the winning image from 2009 Savannah College of Art and Design's Sidewalks Arts Festival. Gray's Reef sponsors an award in the festival each year for the best underwater image.



*2009 Sidewalk Arts Winner*

### **Ocean Literacy Partners**

After participating in the annual ONMS education coordinators meeting in Newport, OR, Cathy Sakas, along with Gray's Reef Superintendent George Sedberry, attended the Ocean Literacy Conference. The week of September 14<sup>th</sup> George and Cathy traveled to Portland, OR to attend the Association of Zoos and Aquariums meeting. Cathy Sakas presented a program on explaining climate connectivity through Gray's Reef's work with the GA Aquarium and the SC Aquarium and through the Rivers to Reefs program. George Sedberry presented a poster on the BLUE Ocean Film Festival and one on cooperative education programs between GRNMS and the GA Aquarium and the SC aquarium.

### **BLUE Attendees Surveyed**

Savannah State University junior (and Gray's Reef summer intern), John Hudson presented the results of his survey of attendees of the BLUE Ocean Film Festival, which was held in Savannah the first week of June. Gray's Reef was a presenting sponsor of the festival. John's sampling of 100 participants found that most of the participants polled were from the 50-59 age group, with the fewest from the 14 and under group. All age groups reported that they felt more knowledgeable about ocean issues after attending the BLUE Ocean Film Festival, with the youngest age groups (14 and under, 15-19) having the highest percentage of participants that gained knowledge. Generally, older participants had previous knowledge about Gray's Reef National Marine Sanctuary. Most participants felt that the festival was priced correctly. John's work was funded by a National Science Foundation Research Experiences for Undergraduates grant to Savannah State University.

### **Presentations**

Cathy Sakas gave a presentation to the Anderson Creek High School Alumni Association in Fayetteville, NC. Most of the 110 attendees were crop and hog farmers. Her messages related to watershed pollution and ocean acidification and our responsibilities to mediate those critical environmental issues.

Superintendent George Sedberry gave a talk on "Regional Coastal and Ocean Sciences Trends"

to the Advisory Board of the Center for Ocean Science Education Excellence—Southeast, and their annual meeting in August.

### **Gray's Reef Signage on Sapelo**

Outreach & Communications coordinator Gail Krueger is working with Sapelo Island Estuarine Research Reserve to have signs about Gray's Reef developed and installed at two beach front locations on Sapelo Island, the closest land point to the sanctuary.

## **RESEARCH**

### **Ocean Science Partnerships**

Superintendent George Sedberry participated in the Joint Subcommittee on Ocean Science and Technology's Ocean Partnership (JSOST-OP) Biodiversity Quarterly Meeting. The meeting included discussions of technology and research (cetacean tag designs, biodiversity survey and measurement), databases and data sharing that includes internet map servers, and concerns about ocean acidification.

In September, George attended the semiannual meeting of the U.S. Committee for the Census of Marine Life. The Census project will end in 2010, and the purpose of the meeting is to discuss the future of marine biodiversity research in the U.S., where that research program should reside, what it should look like, and how it should be funded.

### **Algal assessment**

Nisse Goldberg of Jacksonville University and John Heine of NOAA's Southwest Fisheries Science Center visited Gray's Reef to conduct an algal assessment of the sanctuary. The last algal assessment was conducted by Rick Searles of Duke University back in 1988. Of the sites visited, they found 11 species of alga in the sanctuary whereas Searles found 14. The researchers agree that their level of collection effort (sampling size) was not as high as the 1988 study which may account for the difference in the number of species noted. The investigators are currently developing a proposal for future work in the sanctuary and hope to revisit the sites where Searle collected next year.

### **Invertebrate Monitoring**

Work commenced this quarter to establish a new invertebrate monitoring site at Gray's Reef. Dr. Danny Gleason of Georgia Southern University has been collecting data from a similar site outside the sanctuary for the past six years and proposed replicating the monitoring plots inside Gray's Reef. Because there are differences in the geological composition of the substrate between JY Reef and the sanctuary, there may also be discernable differences in the organisms which settle and colonize the ledge formations. Once established, half of the meter square plots will be cleared so that new colonization by marine invertebrates can be compared to non-cleared plots through time.

### **CO<sub>2</sub> Monitoring at Gray's Reef**

Work has continued with Drs. Scott Noakes and Wei Jun Cai at the University of Georgia and Dr. Chris Sabine of NOAA's Pacific Marine Ecological Laboratory in Seattle, WA. The data buoy in Gray's Reef was outfitted with surface and sub-surface CO<sub>2</sub> sensors and have been collecting data since 2006. Dr. Noakes wrote a grant in 2007 to acquire a bottom mounted CO<sub>2</sub> sensor to compliment the surface array. The bottom mounted sensor collects data and must be retrieved every two to three months. The data collected during this quarter has been downloaded and analyzed and matches closely the data gathered at the surface and in the atmosphere. Dr. Sabine reports that coastal environments directly interact with terrestrial air masses, and because of their sensitivity to changes in wind, river runoff and anthropogenic inputs of nutrients and carbon, are likely to be very sensitive to climate change. Carbon cycling on the continental margins is poorly understood and is under sampled to the point that it is uncertain whether these regions are a net sink or a net source of CO<sub>2</sub> to the atmosphere. The Gray's Reef data buoy is one of only 7 such CO<sub>2</sub> monitoring stations worldwide.

### **Acoustic Tagging Project**

Since July, divers from Gray's Reef, Team Ocean and the SEGOM Region have spent five days in the field in support of the acoustic tagging project. The goal of these missions was to relocate receivers for data download. On several occasions, tagged fish were visually observed by divers. Thirteen of the fourteen

receivers have been relocated (attempts will be made October 1st or 2nd to relocate the remaining receiver). Interesting data continues to come in from the receivers, which are tagging sixteen fish. Receivers are downloaded approximately every three months.

In August, Graduate Research Assistant CJ Carroll, gave a presentation to the South Atlantic Fisheries Management Council's Habitat Advisory Panel. The presentation covered the research conducted aboard the 2009 *Nancy Foster* cruise. She also provided some preliminary results from the ongoing acoustic fish tagging project, which is the focus of her thesis work.

### **Lionfish Assessment**

Lad Akins of Reef Environmental Education Foundation came to Savannah to help Gray's Reef develop a collection protocol for capturing the invasive lionfish *Pterois volitans*. Two days were dedicated to the collection of fishes at sites outside the sanctuary; a total of 58 fish were collected and were so dense at one site that 17 fish were captured in 14 minutes. Gray's Reef staff will continue to visit sites where the fishes were collected to determine how quickly they re-colonize the areas. Efforts will continue in the sanctuary to monitor their presence and they will be removed when encountered.



*Lionfish collected offshore*

### **NOAA Tech Diving Success**

Deputy Superintendent Greg McFall participated in a month-long research cruise to the Papahānaumokuākea Marine National Monument to conduct the first Technical Diving Mission for the ONMS from a NOAA ship. The intent of the diving mission was multi-faceted and attempted

to identify new areas which might be affected by invasive octocoral and algae. An additional objective was to conduct deep reef fish assessments to determine the species ranges of known deep reef species and to collect specimens which had not been previously described.

The benefit of this mission to the NOAA Diving Program is that it showcased the ability of divers from the ONMS to be able to conduct and support such a mission. In addition, the mission proved that the technology can be used to the benefit of science and ONMS management needs in real and meaningful ways. This type of diving had never been done before to the extent that was conducted on this mission and has set a new precedent for the capabilities of the NOAA Diving Program. The mission was a resounding success recording 15 new identifications of fish species where they'd not been seen before and one new species was discovered and collected for scientific description. No invasive algae or corals were found at any of the dive sites.

#### **Recent Publications**

Kendall, M. S., L.J. Bauer and C.F.G. Jeffrey.  
2009. Influence of hard bottom morphology on fish assemblages of the continental shelf off Georgia, southeastern USA. *Bulletin of Marine Science* 84: 265–286.

## **OPERATIONS**

It has been a busy summer for marine operations at Gray's Reef. Weather has been favorable allowing staff to get underway and average of three times a week. By the middle of the summer, over 50 days out on the water had been completed. Gray's Reef could have a record number of underway days this season.

Following are some marine operations accomplishments in support of resource protection, science and exploration:

- Nurse shark release with the UGA Marine Education Center & Aquarium.
- Drilling Operations with Georgia Southern University to create 28 quadrat plots at the GRNMS monitoring station.
- Lionfish wrangle at Snapper Bank and R2 Tower with Lad Akins from REEF.

- Deployed water quality monitoring package near the Gray's Reef buoy site, an ongoing project with UGA.
- Jacksonville University dives to collect algae samples from the reef for future projects.
- Acoustic receiver dives to locate and download information about tagged fish at GRNMS.
- Underwater filming of predation activity at Anchor Ledge.
- Continued work with GA Southern University at J-Y Reef.
- Collected water quality samples in GRNMS with Skidaway Institute scientists.
- Marine operations team along with Greg McFall and UGA's Scott Noakes replaced the YSI Data package at the 41008 Data Buoy and recovered a CO<sub>2</sub> sensor with several months' worth of data.

#### **Battle of the Atlantic Expedition**

For three weeks in August, LTJG Chad Meckley and Todd Recicar provided vessel support in the *Monitor* National Marine Sanctuary's Battle of the Atlantic Expedition. This is the second year in a row that personnel from Gray's Reef have been a part of this exciting project. Despite vessel problems and some rough weather, the mission was a success. For complete information about the mission go to: <http://sanctuaries.noaa.gov/missions/2009monitor/>

## **SE, GOM, CARIBBEAN REGION Sanctuary Advisory Councils Regional Conference Call**

In June, the Superintendents, site Council Coordinators, SAC Chairs and regional staff held their first coordination call. These calls are intended to encourage communication and coordination among the sites and the Sanctuary Advisory Councils. During the first call, discussion topics included lionfish, ocean acidification and sanctuaries as sentinel sites. The group felt that the discussion was productive and agreed to continue having quarterly calls. A second call was held on September 10<sup>th</sup>. Topics covered included the four ONMS Strategic Drivers for 2010, updates on the three topics covered during the first call, law enforcement, the 2010 National SAC Summit and plans for a NMFS/SE Region summit.

### **Climate Related Activities**

Regional staff has been involved in several activities related to climate change issues. Brian Keller serves as the SECART Climate Change Liaison and is contributing to a NOAA southeast regional ocean acidification research priorities plan. In addition, a paper titled "Climate Change, Coral Reef Ecosystems, and Management Options for Marine Protected Areas," by Brian Keller and 10 co-authors, was published online in the journal Environmental Management <http://www.springerlink.com/content/n678r48j56j5174l/>. The paper was based on a report prepared last year for the U.S. Climate Change Science Program.

### **Marine Protection in North Florida**

In July, George Sedberry and Regional Director Billy Causey attended a meeting to discuss a proposed National Marine Sanctuary in the vicinity of St. Johns County, Florida. The meeting was initiated by members of the Board of the Friends of Matanzas, Inc. The group provided information on the resources of the area and George and Billy provided an introduction to the ONMS and an overview of the new sanctuary designation process and the status of the Site Evaluation List.

### **Ocean for Life**

July 15 marked the official start of the Ocean for Life (OFL) program with students from the Middle East and North America meeting in the Florida Keys to start a 10-day field experience. Bill Kiene supported the program by maintaining the OFL website ([www.oceanforlife.org](http://www.oceanforlife.org)) with media documents and photos from the field.

### **Gulf of Mexico Alliance Action Plan Implementation and Integration Workshop**

Bill Kiene attended the Gulf of Mexico Alliance Action Plan workshop, which was intended to review past accomplishments and prepare future work plans for the Alliance's Priority Issue Teams. Bill is part of the Ecosystem Integration and Assessment team, which has ensured that ONMS is contributing to the Alliance's Gulf-wide science, management and education initiatives. The NOAA Gulf of Mexico Regional Collaboration

Team is a key component in the successes of the Alliance, and has helped to make the Flower Garden Banks NMS a demonstration of NOAA's expertise in integrating data collection, accessibility and application. Bill also took part in a NOAA stakeholder forum to explore how NOAA can best serve the Gulf of Mexico environment and its communities in the future.

### **MARES Workshop**

Brian Keller participated in the MARES workshop (MARine and ESTuarine Goal Setting for South Florida; <http://www.sofla-mares.org/>). The meeting was attended by scientists and resource managers from South Florida, who will run or participate in a series of sub-regional workshops to develop conceptual ecological models and quantitative ecosystem indicators. The purpose of MARES is to produce an integrated ecosystem assessment that contributes to South Florida ecosystem restoration efforts and responds to NOAA's ecosystem goal to "protect, restore and manage the use of coastal and ocean resources through an integrated approach to management." The project is funded by CSCOR and will last three years. The first sub-region to go through the process will be the Florida Keys and Dry Tortugas. Brian is a member of the MARES Project Management Committee (PMC).

### **Florida Keys Coral Condition Cruise**

Sarah Fangman participated in the Florida Keys National Marine Sanctuary's Coral Reef and Condition cruise aboard the NOAA Ship Nancy Foster.



*Geoff Cook and Cory Walter conduct coral condition survey in the Florida Keys National Marine Sanctuary.*

The cruise was led by staff from the Florida Keys National Marine Sanctuary and included

scientists from George Mason University, Mote Marine Lab, Harbor Branch, the City of Marathon, the National Zoo and Auburn University. The team visited forty-two sites along almost 200 miles of the Florida Reef Tract. One hundred and seventy-five dives were conducted by eleven divers, totaling more than 180 hours of bottom time. Sarah served as Divemaster for the cruise.

## LEARN MORE ABOUT YOUR SANCTUARY

The Gray's Reef National Marine Sanctuary produces the Sanctuary Program Report in conjunction with quarterly Sanctuary Advisory Council meetings. To learn more about the sanctuary please visit our web site at: <http://graysreef.noaa.gov/>.

To learn more about the Sanctuary Advisory Council please visit: <http://graysreef.noaa.gov/sac.html>.

## VISIT YOUR SANCTUARY!

For information on visiting Gray's Reef National Marine Sanctuary please see: <http://graysreef.noaa.gov/visiting.html>. This page has information about visitor centers, sanctuary regulations, and recreation in the sanctuary, and about the sanctuary's unique resources and how you can help protect them.

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