

# GRAY'S REEF NATIONAL MARINE SANCTUARY



NATIONAL MARINE  
SANCTUARIES



S T A T E   O F   T H E   S A N C T U A R Y   R E P O R T

2004



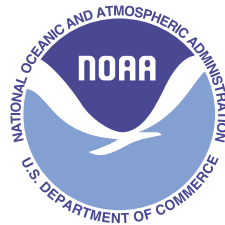
2005



NATIONAL MARINE  
SANCTUARIES

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GRAY'S REEF



NOAA'S NATIONAL OCEAN SERVICE

# The National Marine Sanctuary System

Our national marine sanctuaries embrace part of our collective riches as a nation. Within their protected waters, giant humpback whales breed and calve their young, coral colonies flourish, and shipwrecks tell stories of our maritime history. Sanctuary habitats include beautiful rocky reefs, lush kelp forests, whale migration corridors, spectacular deep-sea canyons, and underwater archaeological sites. Our nation's sanctuaries can provide a safe habitat for species close to extinction or protect historically significant shipwrecks. Ranging in size from less than one square mile to over 5,300 square miles, each sanctuary is a unique place needing special protections. Natural classrooms, cherished recreational spots, and valuable commercial industries—marine sanctuaries represent many things to many people.

The National Marine Sanctuary Program serves as the trustee for a system of 14 marine protected areas, encompassing more than 150,000 square miles of marine and Great Lakes waters from Washington State to the Florida Keys, and from Lake Huron to American Samoa. The system includes 13 national marine sanctuaries and the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve, which is being considered for sanctuary status. The sanctuary program is part of the National Oceanic and Atmospheric Administration (NOAA), which manages sanctuaries by working cooperatively with the public to protect sanctuaries while allowing compatible recreational and commercial activities. The program works to enhance public awareness of our marine resources and marine heritage through scientific research, monitoring, exploration, educational programs and outreach.



# National Oceanic and Atmospheric Administration

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**Carlos M. Gutierrez**

Under Secretary of Commerce for Oceans and Atmosphere and Administrator, National Oceanic and Atmospheric Administration  
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**Richard W. Spinrad, PhD**

# National Marine Sanctuary Program

Director  
**Daniel J. Basta**

Gray's Reef Sanctuary Manager  
**Reed Bohne**

Front Cover: Loggerhead sea turtle, *Caretta caretta*  
Photographer: Flip Nicklin

Back Cover: Patch reef  
Photographer: Flip Nicklin

*Printed on Recycled Paper*

# Message from the Sanctuary Manager

In this document we highlight the accomplishments of Gray's Reef National Marine Sanctuary in 2004. As you will learn, it was a big year for the sanctuary.

NOAA's National Marine Sanctuary Program, including Gray's Reef, continued work in partnership with our constituents to serve the public interest in sustaining a healthy, productive and biologically diverse sanctuary environment.

As the report demonstrates, these partnerships involve a myriad of organizations, institutions and dedicated individuals. Our partners in science, education and resource protection provide the energy and inspiration that fuel our collective accomplishments.

It is a wonderfully diverse universe of talents that congregate around Gray's Reef. During this past year Gray's Reef was the crossroads for a Russian tunicate expert, the National Geographic Society, Jean Michele Cousteau, photographer Bob Talbot, Deputy Secretary of Commerce Ted Kassinger, the Savannah College of Art and Design, high school students from New Jersey, Texas and Michigan, and scientists from more than a dozen institutions around the country.

We believe that true conservation of a national resource such as Gray's Reef, begins and is sustained by the commitment of our community and their involvement in advancing our common interests in promoting a healthy Gray's Reef for future generations. We rely on the guidance and advice of the Gray's Reef Sanctuary Advisory Council as a voice for community interests and concerns. Indeed, the council has been instrumental in shaping the new Gray's Reef management plan that will guide our programs and activities over the next five years. Our council members and many other volunteers not only design but also implement many of the projects that grow Gray's Reef.

This is an invitation to you as well. If you are not already a part of this fascinating underwater world, please join us. There is space available aboard. We will continue to explore new ways to bring Gray's Reef ashore to others and reveal the intricate scientific complexity yet profound aesthetic simplicity of this amazing environment. It's an exciting expedition made better by broad participation and your enthusiasm.

Sincerely,

Reed Bohne

Gray's Reef Sanctuary Manager



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Orange encrusted sponge



Atlantic spadefish



Arrow crab on a sea star

## What is Gray's Reef?

Gray's Reef National Marine Sanctuary, designated in January 1981, is one of the largest near shore live-bottom reefs in the southeastern United States. It is one of 13 marine sanctuaries and the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve that make up the National Marine Sanctuary System. The Commerce Department's National Oceanic and Atmospheric Administration's (NOAA) National Marine Sanctuary Program manages the sanctuary system. The NMSP was established in 1972 by the National Marine Sanctuaries Act.

Gray's Reef National Marine Sanctuary is the only natural area protected off the Georgia coast. The 17-square-nautical-mile sanctuary (about 11,000 acres in size) is just a tiny part of the vast Atlantic Ocean, yet its value as a natural marine habitat is recognized both nationally and internationally.

Within the sanctuary there are both rocky ledges and sandy flat places. Unlike coral reefs, Gray's Reef is made up of scattered limestone rock outcroppings, which stand above the shifting sands of the nearly flat continental shelf. But it does support soft, non-reef building corals and sponges.

The reef's rocky ledges, submerged beneath 60 to 70 feet of water, can be as tall as 15 feet and are highly complex—they have nooks and crannies and bumps and plenty of places for invertebrates (animals without spines) to latch on to and for fish to hide in. Together these animals form a dense carpet of living creatures that in places completely hides the rock. That gives the habitat of Gray's Reef its common name—a "live bottom." The small cryptic fishes as well as worms and other invertebrates provide a food source for the larger pelagic fishes that move through the sanctuary.

Recent extensive bottom surveys have revealed that there is far less of the important rock ledge habitat than originally thought. At one time, it was thought that the rocky live bottom covered about 25-percent of the sanctuary. Now we know that the high-quality ledge habitat is scattered over only about one percent of the sanctuary.

That revelation directly impacts the management of the sanctuary. Both the mandates of the National Marine Sanctuary Program and the Gray's Reef sanctuary designation call for the protection of the quality of this unique and fragile habitat and its living resources. Because there is less of this habitat than originally thought, issues like anchor damage and marine debris become more critical.

Gray's Reef is one of the most popular recreational fishing and sport diving destinations along the Georgia coast. Sportfishing occurs year-round but at different levels of intensity. Fishing for pelagic species such as king mackerel is one of the most popular activities. Regional sport fishing tournaments sponsored by private fishing clubs take place in the spring and summer and Gray's Reef is a popular destination for participants. This year the Georgia state record king mackerel of 75 pounds 12 ounces was caught at Gray's Reef, beating the old record by 12 pounds.

For divers, access to the reef itself requires experience in open-ocean diving; currents can be strong and visibility varies greatly. For those who do not dive, Gray's Reef engages the public through extensive land-based education and outreach programs. The sanctuary is used as a living classroom for educators and numerous education programs are based on the resources of the sanctuary. For scientists, the sanctuary is a living laboratory for a variety of marine research and monitoring projects.

The management of the sanctuary is informed by scientific, educational and constituent interests. The stakeholder-based Gray's Reef Sanctuary Advisory Council serves as a liaison to the community regarding sanctuary issues and represents community interests, concerns, and management needs to the sanctuary. The following sections describe in greater detail the work of Gray's Reef National Marine Sanctuary in these areas in 2004.

## Science - What We've Learned

The primary goal of each sanctuary is resource protection. Each marine sanctuary is to support, promote, and coordinate scientific research on, and monitoring of, the resources of these special marine areas. Research at Gray's Reef is on-going with scientists of various fields using this unique place as a staging area for research about fish populations, invertebrates, undersea geography and even early man.

### Possible New Species of Sea Squirt Found at Gray's Reef

In the summer of 2004, Georgia Southern University scientists working at Gray's Reef to document all the invertebrates living at the sanctuary found three previously unknown sea creatures.

The creatures are types of sea squirts—also known as tunicates—bottom dwelling invertebrate animals that are part of the rich diversity of species found at the sanctuary.

When local scientists could not fully identify the mysterious tunicates, they turned to a Russian tunicate expert for assistance. Out of dozens of samples from Gray's Reef, three were identified as being previously undescribed.

More samples will have to be examined before scientists can definitively say they have a new species, but the animals are unlike any known tunicates, an exciting discovery for the sanctuary. The discovery received extensive electronic and print media coverage with stories appearing in dozens of newspapers including *USA Today* and the *Washington Post*.

### Invertebrate Assessment

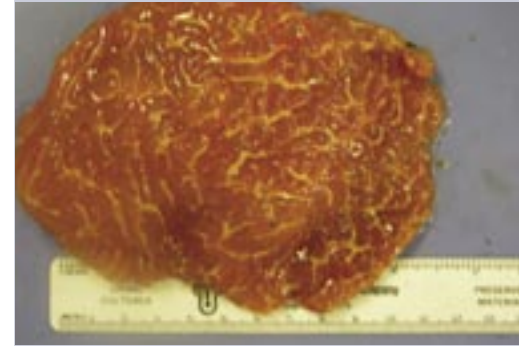
A three-week cruise during June 2004 on the NOAA Ship Nancy Foster enabled scientists to advance work on a guide to the invertebrate inhabitants of the sanctuary. The study will also examine how invertebrate species are recruited to the sanctuary and how their chemical defenses might lead to medical advances. Eventually, the invertebrate field guide will be available online to scientists and the general public. Some 350 species have already been identified and photographed.

During the research, the elusive nudibranch *Dendrodoris warta* or the warty sea slug was photographed at the sanctuary. The slug could not be identified from the existing field guides so images were sent to experts at the University of California at Santa Cruz. They responded with excitement because pictures of the wart sea slug are very rare and little is known about its life history. It was immediately named "Slug of the Week" on the website <http://slugsite.us>

Most of the seafloor at Gray's Reef is sand but this sand is full of life—loaded with tiny organisms called benthic infauna. The dominant species include worms, mollusks and crustaceans. They serve as food for reef fishes, but since they stay in one place, they also serve as reliable indicators of change in habitat quality, including the harmful effects of human-produced pollutants. By monitoring over the long term, scientists can learn valuable information about the overall health of the sanctuary. NOAA scientists studying benthic infauna at Gray's Reef have produced an educational poster about the creatures called "Sea Monsters in the Sand" and an accompanying website at <http://www.seamonsters.noaa.gov>. Gray's Reef also revised and re-issued its popular "Invertebrates of the Reef" educational poster.

### Fisheries Assessment

The 2004 research cruise aboard the NOAA Ship Nancy Foster also enabled scientists from NOAA Fisheries, the Reef Environmental Education Foundation (REEF), the National Aeronautics and Space Administration, the South Carolina Department of Natural Resources, University of Georgia, the National Undersea Research Center and Project Oceanica to compare traditional and emerging fisheries assessment techniques.



Possible new species of sea squirt collected at Gray's Reef.



The elusive nudibranch *Dendrodoris warta* or the warty sea slug.



Six different assessment methodologies--diver visual censuses, baited traps, passive acoustics, hydro acoustics, remote video loggers and remotely operated vehicle (ROV) transects-- were conducted at 10 different sites per method in areas known to have high fishing activity and at 10 different sites with less fishing activity. The result of using these methodologies was to be compared with visual census assessment conducted by volunteer divers from REEF. The REEF Advanced Assessment Team was specially trained by Gray's Reef in methods widely accepted for estimating fish size in addition to their traditional methods of estimating species population numbers and diversity.

Once the data from the assessment technologies is analyzed, scientists will be able to compare the different methods to each other and also compare historic data collected by traditional methods to data collected by newer methods in the future.

In addition, scientists from NOAA's National Centers for Coastal Ocean Science (NCCOS) began to investigate the distribution and density of fish and invertebrate populations and their relationship to the habitat types within the sanctuary. This work will be coupled with the map of habitat types developed in 2001 using side scan and multibeam data collected by the NOAA Ship Whiting.

When the fisheries assessment data collected in Gray's Reef in 2004 is analyzed the sanctuary will consider what may be the best mix of fisheries monitoring techniques to evaluate how fisheries resources are changing over time. In addition, we will have a body of information that could help restoration efforts if the sanctuary were ever to be damaged by natural or man-made events.

### **Avian Resources**

To enhance characterization of the Gray's Reef sanctuary, in 2004 the sanctuary began to look above the waves, not just below them. The first comprehensive survey of seabirds was completed and 27 species of birds have been documented hovering, diving and feeding in the waters of Gray's Reef.

Identifying the birds that feed on the bait fish that are present at the sanctuary helps complete the ecological picture of sanctuary resources.

### **Research Area Working Group**

In 2004, the sanctuary hosted two workshops for the advisory council's working group to investigate a possible recommendation to create a research area within the boundaries of the sanctuary. The idea of a marine research area was first raised during scoping meetings for the review and revision of the Gray's Reef management plan.

The workshops brought together broad interests--fishing, diving, research, education and regional planning--as an 18 member working group of the Council to define the concept, identify the science needs for a research area and to identify several possible locations for a research area.

A wide range of scientific needs were noted. However, the effects of bottom fishing activities, diver impacts and natural variability of large-scale physical and biological processes were identified as among the highest priorities.

To help address these scientific needs, preliminary options for placement of a research area or areas were identified--they included areas within and outside of the sanctuary boundaries. Options were also developed to consider how such an area may be designed to meet its objectives.

The working group expects to meet again in 2005 after analyzing size and placement options. In 2005, the group will decide whether to recommend to the full Advisory Council that a research area be evaluated through an environmental impact statement. The full council will then advise Gray's Reef management on the issue.

## Education - Sharing What We Know

Enhancing public awareness of Gray's Reef National Marine Sanctuary and NOAA's National Marine Sanctuary Program is a vital part of the sanctuary's mission. Education through outreach to teachers and students is one way of accomplishing that goal. To that end, dozens of teachers from across the country are brought together each summer to use the sanctuary as a living classroom. Gray's Reef prepares curriculum materials, distributes materials and teaches classes.

### National Geographic Field Study

One of the most exciting workshops given in 2004 was the National Geographic Field Study course at Gray's Reef. The results of the program sponsored by National Geographic magazine and NOAA gave 12 teacher/mentor and student partner pairs a unique coastal and ocean experience.

The teachers chose their student partners from among the best in their schools. Academics counted, but so did character, a willingness to learn, and openness to new experiences.

The program followed the Gray's Reef "River to Reefs" curriculum, which emphasizes the interconnectedness of the inland watershed to the ocean environment. The teams engaged in everything from kayaking the Altamaha River to operating the Gray's Reef remotely operated vehicle (ROV), to visiting coastal barrier islands.

The partner pairs learned the basics of photography from National Geographic experts and used their pictures to make a photo journal presentation about their impressions of the coast. The students were required to prepare an article describing the field study. Articles about their adventures at Gray's Reef and coastal Georgia ended up in a wide range of publications--from hometown papers like the Tacoma, Wash., *News Tribune* to the *Indianapolis Zoo Magazine*.

Two other workshops conducted by Gray's Reef staff included the Estuarine Science Teachers Workshop and Mapping Marine Sanctuaries GIS Teachers Workshop. Staff also participated in two other workshops presented by our partner entities--the University of Georgia Marine Education Center and Aquarium's Rivers-to-Reef Water Quality Monitoring Teachers Workshop and the Southeastern Center of Ocean Science Education Excellence Teachers Workshop.

### Distance Learning

Even students in land-locked states learned about Gray's Reef, the National Marine Sanctuary Program and the marine environment through the sanctuary's distance learning program. Distance learning enables Gray's Reef educators to televise interactive classes over dedicated lines, bringing topics like marine mammals and ocean ecology into classrooms across the nation. It is a partnership with the University of Georgia Marine Education Center and Aquarium (MECA) providing the studio space and technical support. In 2004, 847 students were reached in seven states including Georgia, South Carolina, New Jersey, Ohio, New York, Texas, and Michigan with programs about Northern right whales, manatees, dolphins, Gray's Reef NMS, watersheds and oceans.







## Education Internship and Student Ocean Council

Since June 2000, Savannah State University, one of Georgia's traditionally minority serving colleges, has identified one student annually to serve as the Education Intern at Gray's Reef. The Education Intern leads the Gray' Reef Student Ocean Council, a program for upper level high school students from local public and private schools who have a desire to learn more about ocean science related careers and subjects.

The internship program is designed to give Savannah State University students work experience and to introduce them to the workings of a government agency tasked with ocean resource management. By working in the office and participating in the various functions and meetings involved with the agency, the student interns receive a broad experience that may help serve as a bridge to future graduate work in the marine science field and develop leadership skills.

At the same time, the Student Ocean Council offers opportunities for high school students to explore the marine and coastal environment as part of an educational package. In 2004, the Student Ocean Council members participated in 12 afternoon programs—from learning to SCUBA dive to exploring a wastewater treatment plant—and one overnight field trip.

Together, the education internship program, the Student Ocean Council and the other Gray's Reef education programs spark the life-long desire to lean about the oceans and foster a spirit of ocean stewardship.

## Project Oceanica

Housed within the College of Charleston's Department of Geology and Environmental Geosciences, Project Oceanica's goal is to integrate education with oceanographic research and exploration and to provide material for educators. In 2004, Project Oceanica participated in the scientific cruise of the NOAA Ship Nancy Foster that explored Gray's Reef. A daily online log of the ship's activities was created for high school and undergraduate audiences about the science conducted on the cruise. You can find them at Project Oceanica's website at <http://oceanica.cofc.edu/home.htm>. Click on "Gray's Reef Expedition," then "Daily Logs."



## Ocean Encyclopedia

One hundred Gray's Reef species selected for their ecological and economic importance are included in the Ocean Encyclopedia of the Sanctuaries, a joint project of NOAA and The Ocean Channel. The encyclopedia will eventually profile all the marine sanctuaries providing a window to the incredible diversity of marine habitats represented in the sanctuary system. See the encyclopedia at <http://www.ocean.com/Library/Encyclopedia/NMS/GraysReef/>.

## Outreach - How We Collaborate

Enhancing public awareness, understanding and appreciation of the marine environment is a mission of both NOAA's National Marine Sanctuary Program and of Gray's Reef National Marine Sanctuary. While the sanctuary education program reaches out to teachers and students in traditional classroom settings, the outreach program brings the marine environment to a more general public in less programmatic learning environments such as festivals, exhibits and events.

Part of this work is to reach people who may not have an established interest in the marine environment, to engage them in thought provoking ways and to encourage them to learn more. The exhibits program allows the sanctuary to reach millions of people - far more than could be accommodated in a traditional visitor center setting for this offshore sanctuary. In addition, the outreach program keeps Gray's Reef before the local, regional and national media.

### The Savannah Ocean Film Festival

Gray's Reef organized the first-ever ocean themed film festival on the east coast in 2004. Nearly 2,000 adults and children flocked to three days' worth of films and videos at the Savannah Ocean Film festival in September. The Savannah Ocean Film Festival was named one of the "Five Festivals We Loved in 2004" by the *Savannah Morning News*.

Some 25 films with ocean-oriented themes were screened at this first-ever east coast all-ocean film festival. This special, community-wide event brought together the sanctuary, the National Marine Sanctuary Foundation, the Savannah College of Art and Design, the Tybee Island Marine Science Center and several other local partners and Gray's Reef volunteers.

Highlighting the evening screenings were films by ocean videographer Bob Talbot and an award-winning animated documentary about early ocean science by director David Lebrun. Both directors introduced their films on opening night and later discussed the movies with the audience.

On the following night, two films by Jean-Michele Cousteau received their North American premier in Savannah. These films chronicled the real-life efforts to return Keiko, of "Free Willy" fame, to his native waters off Iceland. After the films, Gray's Reef staff and Georgia Department of Natural Resources marine mammal expert Clay George answered audience questions about whales.

Both Jean-Michel Cousteau and Bob Talbot are on the board of directors for the National Marine Sanctuary Foundation.

The festival included a special day of children's programming combining videos, hands-on experiences and popcorn at the Tybee Island Marine Science Center; the center is a Gray's Reef exhibit partner.

### Exhibits

Gray's Reef has embarked on an ambitious plan to install or expand museum-type exhibits at a variety of regional facilities. Among the first to be completed is a revitalized diorama at Fernbank Museum of Natural History in Atlanta. The staff of Fernbank wanted to create the most realistic replica of the reef ever seen in an exhibit setting and to provide as much interpretive and educational information as possible to further enhance the visitor experience. They succeeded in doing so.

The existing diorama reef was reconstructed using concrete and foam to fabricate sculpted rock ledges and overhangs just like those found at the sanctuary. Sandy open areas, another habitat feature of the reef, were



Georgia Southern University exhibit of Gray's Reef.



included with an eye towards providing a place to put display models of open-water and sandy bottom animals. The newly refurbished diorama contains 40 specimens of animals that are found at Gray's Reef.

In addition to Fernbank, in 2004 Tybee Island Marine Science Center installed a new 800 gallon tank representative of the habitat and creatures of Gray's Reef. New graphic panels interpreting sanctuary resources for visitors were also installed.

The South Carolina Aquarium installed a special communications system so divers can talk to visitors about the Gray's Reef habitat; new graphic panels are on the way and there are plans for a totally new interactive Gray's Reef exhibit.

The Georgia Southern Museum hosted a special summer exhibit, "Gray's Reef: Habitat and Haven." When the exhibit was concluded, elements of it were added to Georgia Southern's science education outreach program where they tour regional school systems.

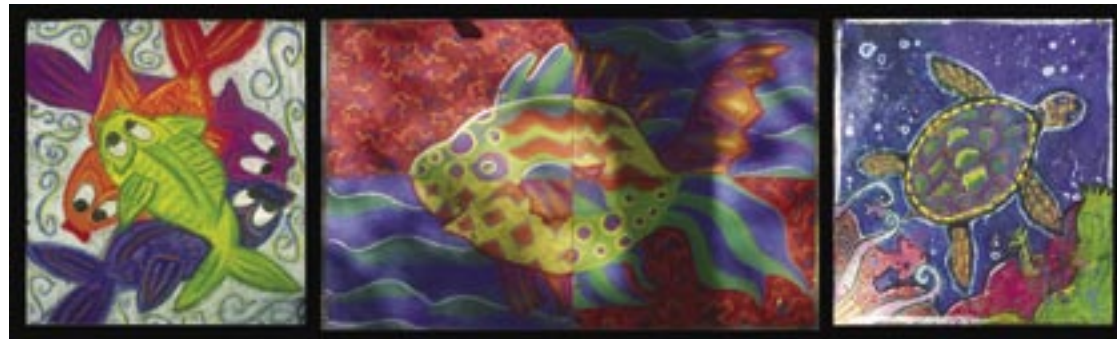
### Sidewalks Arts Festival

Some 80 artists accepted the sanctuary's challenge and created underwater environmental scenes in chalk in April for the Fantastic Fishes Art Contest during the 2004 Savannah College of Art and Design's Sidewalk Arts Festival.

Students, prospective students and alumni from the Savannah College of Art and Design used colored chalk to draw on the sidewalks around Savannah's Forsyth Park. Each year the festival unleashes a surge of creative energy. This year, more than 500 artists worked on the ephemeral artworks; at least 80 of them entered the Gray's Reef Fantastic Fishes Art Contest. As they worked, an estimated 10,000 people – senior citizens, tourists and parents with toddlers in tow – strolled by.

In just a few hours the chalk artists created lavish underwater scenes filled with sea turtles, fish, divers and they created scenes with a message to keep our ocean and other waterways clean.

This was the first year Gray's Reef sponsored a prize in the popular event. The art contest provided a way to get dozens of people—some of whom might not routinely spend much time thinking about the ocean-- to think about the marine environment as a source of inspiration for their art and for thousands of visitors to see ocean-inspired art work. (See the winning images below.)



### Publications

Gray's Reef began regular publication of a newsletter in 2004, which reaches about 1,000 people in print or electronic form. The *Shades of Gray* newsletter highlights research, education and outreach events involving the sanctuary, its staff and volunteers.

Gray's Reef sponsored two *Newspapers in Education* supplements in 2004. The Gray's Reef teacher's guide reached 415 classrooms in the Atlanta metropolitan area through the *Atlanta Journal Constitution*. The publication focused on the interconnectedness of the inland watershed to the ocean environment. A second supplement in the *Savannah Morning News* reached 6,000 children in the Savannah metro area with similar material.

The sanctuary maintains regular communication with the public and the media through press releases and radio spots. Each month, Gray's Reef produces a radio spot for broadcast on the Adventure Radio Group—a group of seven AM and FM radios stations. The combined reach of these stations is more than 250,000 households. Some of the spots broadcast in 2004 included holiday greetings from sea creatures, notice of the possible new species of sea squirts found at the sanctuary by one of the scientists who discovered them, a notice of the bird species counted done by a volunteer birder who help with the surveys.

## Events

Gray's Reef participated in a variety of ocean-related events with our various partners during 2004. Among them were CoastFest with the Georgia Department of Natural Resources, Earth Day with the city of Savannah, and the Marine Open House with the Skidaway Institute of Oceanography.

## Community - How We Grow

The larger community beyond the sanctuary is important to Gray's Reef. Through the sanctuary advisory council, the Gray's Reef volunteer program and other means, Gray's Reef Sanctuary is an active member of local, regional and national interest groups.

### The Sanctuary Advisory Council

Gray's Reef has a 14-member sanctuary advisory council, which, through its members, serves as a liaison to the community regarding sanctuary issues and represents community interests, concerns and management needs to the sanctuary. Council members represent science, fishing, diving, education, law enforcement, conservation, and state and federal agency partners. Advisory council meetings are open to the public. The council holds approximately four meetings a year.

In 2004, the advisory council reviewed public comments on the Gray's Reef Draft Management Plan and received updates on the sanctuary's education, research and law enforcement programs. In addition, council members were often present at the six rounds of public comment meetings on the Draft Management Plan that took place early in the year.

### Volunteers

Gray's Reef has a burgeoning volunteer program that encourages members of the general public to get involved with the sanctuary in very direct, hands-on ways. The volunteers roll posters for mailing and sell t-shirts. They brave the deck of pitching ships to look for tiny birds. They dive. They write curriculum materials. They volunteer their hearts and hands.

During 2004's Savannah Ocean Film Festival, the staff of Gray's Reef held the first reception honoring these remarkable people. Honorees included Sue Chaplin-Ebanks, a master degree student who devoted many hours helping to develop an oceanography curriculum; Ralph Neely, owner of a dive ship who spent countless unpaid hours supporting the sanctuary dive program during the 2004 field season; Russ Wigh, (pictured far right) who developed the first birding surveys for Gray's Reef; Samantha Bonnell, a college student who supported various outreach efforts such as Earth Day; and the members of the Savannah Scuba Club, whose members conducted reef cleanups.



# Partnerships



US Coast Guard cutter.



GA DNR enforcement patrol.



US Coast Guard deploys Gray's Reef data buoy.

## NOAA Environmental Hero Award

On Earth Day 2004, Department of Commerce General Counsel and Deputy Secretary, Theodore W. Kassinger visited Gray's Reef to present a NOAA Environmental Hero award to pioneering marine educator Bob Williams of the University of Georgia Marine Education Center and Aquarium. Williams directs the Distance Learning Program at the aquarium. Through his work over many years, Williams has enabled more than 5,000 students from across the country to learn about Gray's Reef and the coastal environment in their own classrooms. The staff of Gray's Reef nominated Williams for the award.

The NOAA Environmental Hero Award was established in 1995 to commemorate the 25th year anniversary of Earth Day. This prestigious award is presented to individuals and organizations that volunteer their time and energy to help NOAA carry out its mission. Previous recipients include esteemed oceanographers Jean-Michel Cousteau and Sylvia Earle.

## Partnerships - Who We Work With

NOAA is responsible for the protection and conservation of Gray's Reef National Marine Sanctuary's valuable and vulnerable resources. Effective marine conservation bridges all boundaries and borders. Our partnerships with constituents – users, researchers, educators and other federal and state management agencies – are critical elements of site management. Some of the partners include NOAA Fisheries, U.S. Coast Guard, Georgia Department of Natural Resources, South Atlantic Fisheries Management Council, South Carolina Department of Natural Resources and the Skidaway Institute of Oceanography. Gray's Reef relies on collaboration with sanctuary partners to maximize the use of appropriated funds and avoid duplication of efforts.

The sanctuary works with its many partners to develop exhibits to raise public awareness of sanctuaries and ocean issues; protect the highly endangered Northern right whale; and explore the connections between offshore features like the Savannah Scarp and the Charleston Bump to the rivers and mountains of Georgia.

### Resource Conservation

The sanctuary works with several other agencies including the Georgia Department of Natural Resources, the U.S. Coast Guard and the U.S. Coast Guard Auxiliary to monitor activities in the sanctuary and to enforce regulations when necessary. These agencies use their boats and planes to support sanctuary conservation responsibilities.

On December 31, 2004, Gray's Reef staff responded to a call for support from NOAA Fisheries in an effort to disentangle an endangered juvenile right whale. Sanctuary offices in Savannah were used by NOAA Fisheries as a command post for communications and media relations. The sanctuary took its two offshore vessels the R/V *Joe Ferguson* and R/V *Sam Gray* to the incident site approximately 40 miles offshore Hilton Head, S.C., and provided back up support to the Coast Guard Cutter *Yellowfin* on scene. The R/V *Sam Gray* served as an observation and tracking vessel for the disentanglement team. The disentanglement team from the Center for Coastal Studies successfully removed approximately 550 feet of the lobster trap line from the whale.

### Ocean Observing

Gray's Reef is an active participant in the Southeast Atlantic Coastal Ocean Observing System (SEACOOS), the Sanctuary Wide Monitoring and the Integrated Ocean Observing Systems. Together these and other monitoring systems are giving the nation better comprehensive near-real-time information on ocean and coastal conditions for a broad range of users. The system is improving weather forecasting, detecting and forecasting ocean components of climate variability, and facilitating safe and efficient marine operations.

The sanctuary added a new package of oceanographic sensors to the sanctuary data buoy in April. The buoy is part of the Marine Observation Network buoys operated by NOAA's National Data Buoy Center, an operation within NOAA's National Weather Service. This operational network delivers real-time information to forecasters and NOAA operational center to support national and international warning programs, safe and efficient transportation of personnel and good, environmental monitoring programs and climate research and prediction needs.

The scientific community is very interested in the upgrade to the NOAA data buoy. The enhanced data buoy will provide information on the movement of water column masses by temperature as well as data on conductivity (a water quality measurement), depth (tide height), salinity, chlorophyll *a* (a measure of productivity in the water) and dissolved oxygen.

The enhanced ocean data buoy at Gray's Reef will become a sentinel station for the new regional ocean observing network that has been established in the southeast, adding information on the nearshore component to the observing network's data flow.

Gray's Reef also provides diving and boat support to our partner the Skidaway Institute of Oceanography for the ocean observing network. This real-time observational network provides a range of oceanographic and meteorological observations on a continuous real-time basis from eight offshore platforms operated by the U.S. Navy.

## Homeport - Where We Are Based

Gray's Reef National Marine Sanctuary is 17 miles east of Sapelo Island. The sanctuary's administrative offices are on the campus of the Skidaway Institute of Oceanography on Skidaway Island, near Savannah, Ga.

The sanctuary staff includes Reed Bohne, sanctuary manager; Leah Cooling, education intern; April Fendley, administrative coordinator; Peter Fischel, executive officer; Keith Golden, operations coordinator; Gail Krueger, outreach coordinator; Greg McFall, research coordinator; Cathy Sakas, education coordinator; Becky Shortland, stewardship coordinator; and Jim Sullivan, regional projects coordinator. During the summer months, when field research is at it most intense, Gray's Reef adds between one and three temporary interns to its staff.

The location on the Skidaway campus links the sanctuary with other academic institutions of the University System of Georgia such as Georgia Southern University, Georgia Tech and the University of Georgia, all of which have facilities and programs on campus. In 2004, the sanctuary operated a 41-foot renovated Coast Guard patrol vessel for research and dive operations and two 32-foot outboard vessels for day trips and limited dive operations. In 2004, Gray's Reef had 75 vessel days at sea.



Skidaway Institute of Oceanography campus.



Gray's Reef Research Vessel *Joe Ferguson*.

## Our Ocean Planet

In September 2004, the White House formally received the U.S. Commission on Ocean Policy's final report from the Admiral James D. Watkins, USN (Ret.), chairman of the commission.

In December 2004, the President submitted his response to the Commission on Ocean Policy's report, called the U.S. Ocean Action Plan, to Congress. The plan outlines new directions for the nation in responsible use and stewardship of ocean and coastal resources for the future.

The plan's action items include: the creation of a cabinet level committee on ocean policy; working with regional fisheries councils to promote greater use of market-based systems of fisheries management; the development of an integrated ocean observation network; the creation of a research priorities plan; the establishment of a coral reef action plan; raising the level of "ocean literacy;" and the cultivation of regional partnerships, among other priorities.

Gray's Reef National Marine Sanctuary is a full participant in many aspects of these activities through its education and outreach programs, its work with its partners and its on-going monitoring and study of marine resources both within and outside of the sanctuary.



## Ocean Facts

Population - More than half the world's population live within a 100 km or 60 miles distance from the coast. This is more than 2.7 billion people.

Ocean life - 80% of all life on earth is found under the ocean surface.

Algae - algae produce over half of the oxygen that we breathe.

Habitat - The oceans contain 95% of the habitat space on the planet.

Currents - At a speed of 60 miles per day, the Gulf stream moves a 100 times as much water as all the rivers on earth.

Ocean Depth - The average depth of the ocean is 3795 m. (The average height of the land is 840m).

Rising Sea Level - If all the world's ice melted, the oceans would rise 200 ft (66 mtr).

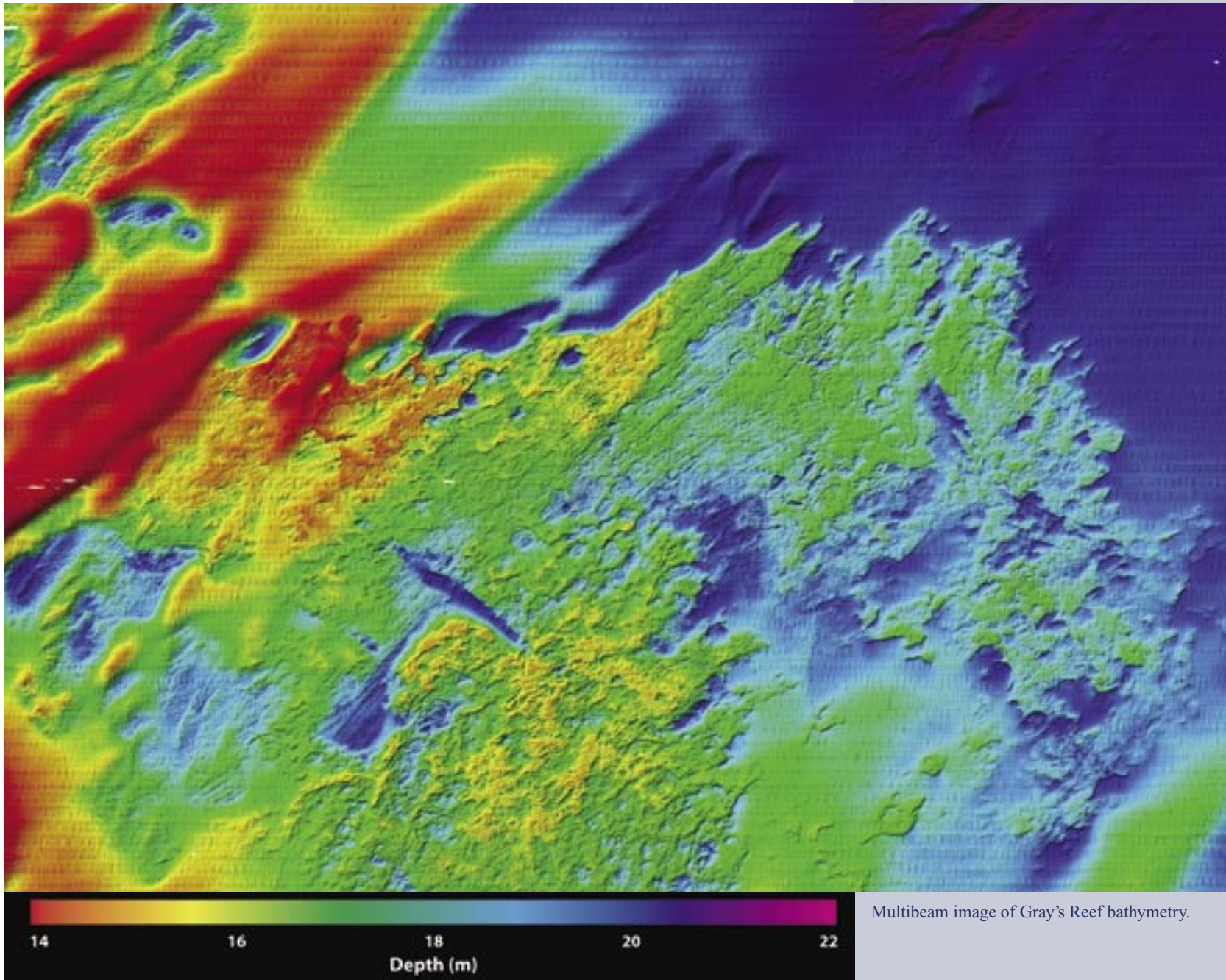
Volcanic Activity - 90% of all volcanic activity on Earth occurs in the ocean.

Water Masses - Over 70% of the earth's surface is covered with water. This is approximately 362,000,000 square kilometers. The oceans contain 97% of all the water on earth,

Gold - If all the gold suspended in the world's seawater were mined, each person on Earth could have about 9 pounds of gold.

Mountain ranges - Earth's longest mountain range is the Mid-Ocean Ridge. It is four times longer than the Andes, Rockies, and Himalayas combined.

The tallest mountain on Earth is also partly underwater. Mauna Kea, an inactive volcanic island in Hawaii, stands 33,465 feet tall when measured from ocean floor to summit.



Multibeam image of Gray's Reef bathymetry.





