



Fieldwork

Coral Coring in Flower Garden Banks National Marine Sanctuary— a Collaborative Effort

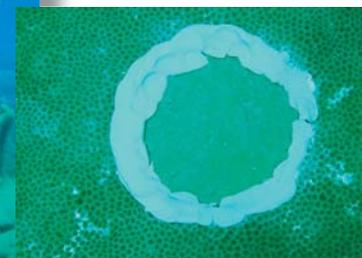
By Chris Reich and Don Hickey

U.S. Geological Survey (USGS) scientists participated in a multiagency cruise during the week of May 23 to collect coral cores for paleoclimate studies in the Gulf of Mexico. The cruise was a milestone for managers at the National Oceanic and Atmospheric Administration (NOAA) Flower Garden Banks National Marine Sanctuary and researchers from Texas A&M University, who had postponed the cruise six times because of dive-boat engine failures or bad weather. This time it went off without a hitch—no mechanical glitches with the dive boat (merchant vessel *Fling*), the best weather the boat operators had seen in a long time, and a drilling team composed of some seasoned veterans from both NOAA and the USGS. In addition, **Emma Hickerson**, research coordinator for Flower Garden Banks National Marine Sanctuary, was able to gather a group of coral-disease researchers from Mote Marine Laboratory, George Mason University, and NOAA to look into a recent occurrence of white-plague disease in the sanctuary. The plague is the first-recorded coral disease for the area and has sanctuary management concerned about the future health of the pristine coral-reef system.

Flower Garden Banks National Marine Sanctuary is composed of three banks (East Flower Garden Bank, West Flower Garden Bank, and Stetson Bank) and encompasses an area of approximately 40 mi². The coral reefs cap the tops of salt domes that are believed to have formed approximately 10,000 years ago. East and West Flower Garden Banks are home to an almost-unheard-of 80-percent live-coral cover; Stetson Bank contains few corals as a result of its close proximity to the coast. For additional details on the Flower



—**Don Hickey** (right) cores one of the large *Montastraea faveolata* coral heads as **Chris Reich** (left) waits to help extract the core. Photograph by **Simone Francis** (Texas A&M University).



▲ After extracting a core, drillers inserted a cement plug with palygorskite clay around its edge into the hole. The coral will eventually overgrow the plug and fill the hole. Photograph by **Emma Hickerson**, Flower Garden Banks National Marine Sanctuary.

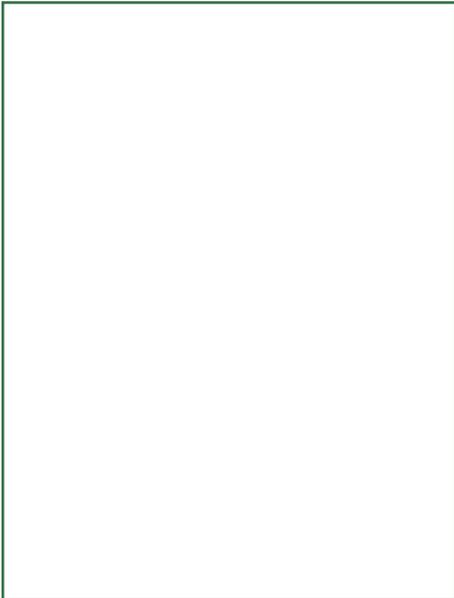
Garden Banks, visit URL <http://www.flowergarden.nos.noaa.gov/>.

The primary focus of the cruise was to collect coral cores from two species: *Montastraea faveolata* and *Siderastrea radians*. Three cores of *M. faveolata* were recovered from East Flower Garden Bank, and two from West Flower Garden Bank; the longest core measured 2.1 m. The estimated growth rate of this species is approximately 10 mm/yr; thus, the long core will provide a record going back about 210 yr. At West Flower Garden Bank, two *S. radians* heads were cored, and a 2.2-m-long core was recovered. On the basis of *S. radians*' typical growth rate of about 4

to 6 mm/yr, that core will give researchers an unprecedented record back some 500 years for the Flower Garden Banks area. This cruise is the first on which such long coral cores have been collected within the marine sanctuary boundaries.

The cores will be analyzed for $\delta^{18}\text{O}$ value, which will be used as a proxy indicator of paleoclimate sea-surface salinity and temperature for the Flower Garden Banks area of the Gulf of Mexico. **Amy Bratcher** (Ph.D. candidate at Texas A&M University and one of the drillers during the cruise) will slab the cores, sample the core slices, and run the samples on an inductively

(Coral Coring continued on page 2)



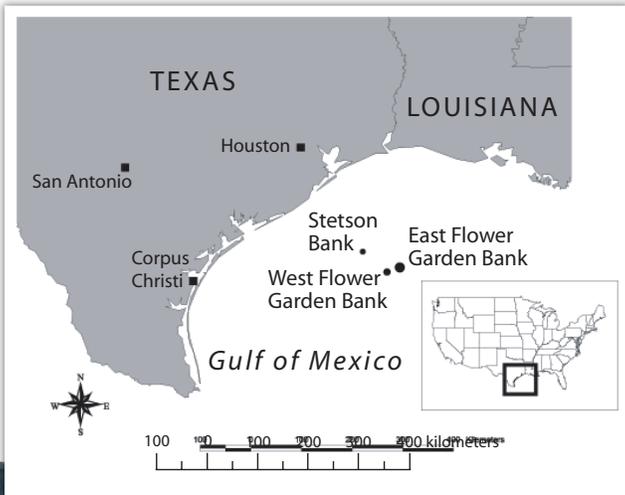
Fieldwork, continued

(Coral Coring continued from page 1)

coupled plasma mass spectrometer (ICP/MS). In addition, **Chuck Holmes** (USGS, St. Petersburg, FL) will use laser-ablation ICP/MS techniques on the core slabs to observe variations in trace-metal contents. Variations in trace-metal contents within the coral skeletons may lead to a better understanding of Mississippi River discharge in the Gulf of Mexico, as well as fluctuations in the Gulf of Mexico Loop Current. These results, the first obtained for the Flower Garden Banks area, will provide new insights into coral growth and other physical-oceanographic processes.

None of this work would have been possible were it not for the well-rounded cast of drillers and support divers assembled by **Emma Hickerson**. The corals were drilled by three teams, each consisting of three divers.

This arrangement worked well because diving in water depths of 65 to 80 ft required divers to spend 2.5 hours at the surface between dives to avoid physiological problems. Continually rotating the three teams allowed each team to conduct three to four dives each day. All participants brought a wealth of knowledge about the Flower Garden Banks and shared their previous experiences in coral coring. ☼



Contents

Fieldwork	1
Research	2
Outreach	4
Meetings	9
Awards	10
Publications	11

Submission Guidelines

Deadline: The deadline for news items and publication lists for the September 2005 issue of *Sound Waves* is Thursday, August 11.

Publications: When new publications or products are released, please notify the editor with a full reference and a bulleted summary or description.

Images: Please submit all images at publication size (column, 2-column, or page width). Resolution of 200 to 300 dpi (dots per inch) is best. Adobe Illustrator© files or EPS files work well with vector files (such as graphs or diagrams). TIFF and JPEG files work well with raster files (photographs or rasterized vector files).

Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.



*Coral cores collected from coral heads at West Flower Garden Bank. Photograph by **Emma Hickerson**, Flower Garden Banks National Marine Sanctuary.*

Location of study sites within Flower Garden Banks National Marine Sanctuary. Both East and West Flower Garden Banks were visited for coring. (Modified from figure provided by Flower Garden Banks National Marine Sanctuary.)

Research

Brief Tsunami Warning Startles U.S. West Coast, Reveals Strengths and Weaknesses in Tsunami Preparedness

By **Helen Gibbons**

A magnitude 7.2 earthquake off the northern California coast on the evening of June 14 triggered a brief tsunami warning for the entire U.S. west coast, and a flurry of news-media inquiries to earthquake and tsunami experts in the U.S. Geological

Survey (USGS) and the National Oceanic and Atmospheric Administration (NOAA). NOAA's National Weather Service issued the tsunami warning about 5 minutes after the earthquake struck and cancelled it

(Tsunami Warning continued on page 3)