USGS

Sound Waves Coastal Science and Research News from Across the USGS

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Fieldwork

Joint USGS/NOAA Cruise Samples Contaminants near San Francisco

By Dann Blackwood

The NOAA ship *McArthur* sailed from San Francisco on February 18 with a scientific party of chemists, geologists, and biologists from the USGS' Coastal and Marine Geology Program (CMGP), the National Oceanic and Atmospheric Administration (NOAA)'s Status and Trends Program, and NOAA's Marine Sanctuary Program. Thanks to the efforts of many, the USGS was able to assist NOAA in acquiring sediment samples on the California continental shelf and to obtain additional samples for USGS studies of contaminant transport in the Pacific Ocean offshore of San Francisco.

Mike Torresan (Menlo Park, CA) and **Dann Blackwood** (Woods Hole, MA) were asked to assist NOAA with deep-water sampling near San Francisco from February 28 to March 6. **Ian Hartwell** of NOAA did a great job as chief scientist. **Marilyn ten Brink** (Woods Hole) and **Brian Edwards** (Menlo Park) were instrumental in the planning of the cruise. **Ellen Mecray** and **Joe Newell** mobilized and shipped needed gear on short notice from Woods Hole. **Mike Torresan** and **Sid Mitra** collected and organized needed equipment and supplies from Menlo Park.

The collaborative cruise aimed to collect samples for measurement of sediment texture, chemical composition, and accumulation of contaminants on the continental shelf west of San Francisco and the city's Southwest Ocean Outfall, which discharges treated sewage and stormwater about 6 km (4 mi) offshore. Sediment-sampling stations were located in a grid designed to show the distribution and amounts of pollutants in the sediment and their transport off the shelf.

(USGS/NOAA Cruise continued on page 2)

Dann Blackwood *(Woods Hole) prepares a small van Veen grab to sample sediment from the Rigid-Hull Inflatable Boat aboard the NOAA ship* McArthur *near the Golden Gate Bridge. The nearshore sample will provide information about contaminants and sediment chemistry near the mouth of San Francisco Bay, thus rounding out the offshore sampling grid. Photograph by* ***Gunnar Lauenstein*** *(NOAA).*

Ian Hartwell *(left) and* ***Mike Torresan*** *subsample the upper surface of a sediment sample in a large van Veen grab. Photograph by* ***Dann Blackwood****.*

Sound Waves

Editor
Helen Gibbons
Menlo Park, California
Telephone: (650) 329-5042
E-mail: hgibbons@usgs.gov
Fax: (650) 329-5198

Print Layout Editors
Susan Mayfield, Sara Boore
Menlo Park, California
Telephone: (650) 329-5066
E-mail: smayfiel@usgs.gov; sboore@usgs.gov
Fax: (650) 329-5051

Web Layout Editor
Trent Faust
St. Petersburg, Florida
Telephone: (727) 803-8747 Ext. 3043
E-mail: tfaust@usgs.gov
Fax: (727) 803-2030

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Submission Guidelines

Deadline: The deadline for news items and publication lists for the June issue of *Sound Waves* is Monday, May 20.
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).

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Want to e-mail your question to the USGS? Send it to this address: ask@usgs.gov

Fieldwork, continued

Doug Pirhalla *(NOAA),* ***Mike Torresan****, and* ***Ian Hartwell*** *(left to right) "hang loose" on the way to the next station. Photograph by* ***Dann Blackwood****.*

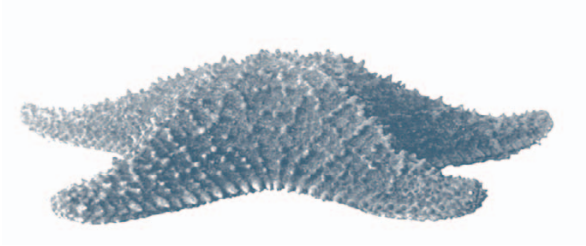
Gunnar Lauenstein *and* ***Sabrina Varnam*** *(NOAA) collect a subsample for grain-size analysis. Photograph by* ***Dann Blackwood****.*

(Right). Seaman Surveyor ***Leroy Jordan*** *recovers the CTD (conductivity-temperature-depth)/water-sampler rosette. Water-sampling bottles form the outer ring of the rosette. A CTD recorder in the rosette's center records the conductivity, temperature, and depth of seawater from which each sample is taken. The water samples will be analyzed for chlorophyll content, a measure of biologic productivity in the water. Photograph by* ***Dann Blackwood****.*

(USGS/NOAA Cruise continued from page 1)

Some of the contaminants being studied include trace metals, hydrocarbons, and pesticides. Samples will also be analyzed for pharmaceuticals, which are a growing threat to the environment and at this time are largely unregulated in septic treatment.

This multidisciplinary project was successful for both USGS and NOAA scientists. All the priority sediment stations were sampled, as well as many of the secondary sites, and water-column sampling occurred concurrently. **Ian Hartwell** (NOAA), **Brian Edwards**, **Mike Torresan**, **Sid Mitra**, and **Tom Lorenson** (Menlo Park), and **Marilyn ten Brink** (Woods Hole) will analyze sediment samples along with photographs provided by **Dann Blackwood** (Woods Hole) of the sediment surface of each grab sample.☸



Ground-Truthing Coral-Reef Maps Produced from Remote-Sensing Data

By Tonya Clayton

In March, a diverse group from the USGS' St. Petersburg Center for Coastal and Regional Marine Studies (CCRMS) and the University of South Florida (USF)'s College of Marine Science headed south for a week of fieldwork in Biscayne National Park. Foiled since January by cold fronts that almost eerily coincided with each planned trip, the frustrated gang of five—**John Brock**, **Tonya Clayton**, **Don Hickey,** and **Damaris Torres** (USGS) and **Dave Palandro** (USF)—was delighted finally to be heading out to the reefs. (Note to the rest of the country: "Cold fronts" in South Florida aren't really cold, but they are blustery!)

Biscayne National Park, at the north end of the Florida Keys, is a true "water park," with more than 95 percent of its area covered by water. Within the park boundaries can be found the longest stretch of mangrove forest remaining on Florida's east coast, 14 threatened or endangered wildlife species, and the northernmost nearshore coral reefs in the continental United States. As the reader may recall from past issues of *Sound Waves*, the USGS has a long history of coral-reef research in Biscayne National Park. Now, in continued cooperation with **Richard Curry** (Biscayne National Park science coordinator), the USGS is also exploring various means of rapidly mapping and monitoring large areas of coral reefs and associated habitats. Although the methods developed will have worldwide application, Biscayne National Park serves as one of the primary natural laboratories for this research effort.

Biscayne National Park, FL. Image courtesy of National Park Service (Biscayne National Park).

The primary aim of this particular field trip was to collect ground-truth data for comparison with benthic classifications based on remote-sensing data. We are comparing data from satellite and aircraft sensors of varying spatial and spectral resolution, and assessing their utility in providing useful maps of bottom type. On this particular trip, we visited more than 100 carefully selected sites to determine and document precisely what the bottom looks like at each site. These data will now be used to assess the accuracy with which benthic classifications can be made from space. We'll keep you posted! ❁

Research

Teamwork Sheds Light on Shorebird-Migration Mysteries

By John Y. Takekawa

Following the spring migration of shorebirds along the Pacific coast is a daunting task. Migratory birds travel thousands of miles from their wintering areas in southern latitudes to their Arctic breeding areas. Most shorebirds stop to "fuel up" from a few days to a few weeks at key wetland sites. Recognizing and conserving key migration areas is crucial for protecting these long-distance travelers, yet few studies have examined the complete migration path of a shorebird species because of the difficulty of working across such vast areas. Over the past decade, I have worked with scientists at the Prince William Sound Science Center (a nonprofit research organization in southeastern Prince William Sound, Alaska) and Point Reyes Bird Observatory (a nonprofit research organization northwest of San Francisco, CA) to tackle this problem.

Although radio transmitters have been developed recently that enable biologists to track ducks and larger birds with satellites (see URL **http://www.werc.usgs.gov/pinsat/**), most shorebirds are too small for this technology. Instead, we enlisted the help of a team of biologists at migration areas from California to Alaska to listen for shorebirds marked with miniature, 1-gram transmitters. We used mist nets and rocket nets to catch three species of shorebirds at San Francisco Bay and Grays Harbor, WA, in early April 2001. The transmitters were glued on the backs of dunlin, short-billed dowitchers, and long-billed dowitchers. The transmitters

(Shorebird Migration continued on page 4)

Three long-billed dowitchers captured and radio-marked for migration studies. Photograph by USGS.

Each bird is measured and weighed to examine its condition before marking. Photograph by USGS.

(Shorebird Migration continued from page 3)

were designed to work for about 6 weeks and then fall off the birds.

Biologists worked in aircraft and on the ground to track 82 birds during April and May from San Francisco Bay northward. We located 88 percent of the individuals with working transmitters north of the area where they had been marked. The most important migration area was the Copper River Delta in Alaska, where we heard 76 percent of the radio-marked birds: 79 percent of the dunlin, 63 percent of the short-billed dowitchers, and 76 percent of the long-billed dowitchers. The second most important region was Grays Harbor and Willapa Bay in Washington.

The length-of-stay varied by species in the areas where the birds were captured. In San Francisco Bay, long-billed dowitchers stayed an average of 7.7 days, whereas short-billed dowitchers stayed an average of 10.8 days before migrating. We estimated the duration of a shorebird's stay at a particular migration area to range from 1 to 5 days. Such rapid turnover suggests that daily to weekly counts may represent different individuals and that some areas may support much larger numbers of birds than previously estimated.

Shorebirds may follow different strategies at different migration sites. For example, only a small proportion of long-billed dowitchers were detected at Grays Harbor, suggesting that they either used other wetlands or flew longer distances than the other species. Birds generally stayed longer at Willapa Bay, a "staging" area where birds stopped for longer periods to accumulate fuel. Individuals that arrived later tended to stay for shorter periods, suggesting that they may have only a limited period to begin breeding.

Our project was recently recognized by the U.S. Forest Service with a Taking Wing Award for contributions to migratory-bird conservation. Work continues in 2002 with the first effort to follow the spring migration of radio-marked shorebirds from northern Mexico. With cooperators from local universities in Sinaloa, we will radio-mark western sandpipers and dowitchers with added listening posts in San Diego Bay, the Salton Sea, and Point Mugu in southern California and Stillwater National Wildlife Refuge in Nevada. Our project will be featured on the Sister Shorebirds Schools Web site (at URL **http://sssp.fws.gov/**) and list server, an environmental-education program sponsored by the U.S. Fish and Wildlife Service. This Web page received more than 125,000 hits last year, including subscribers from 36 States and 23 different countries.❁

A radio-marked dunlin. Photograph by USGS.

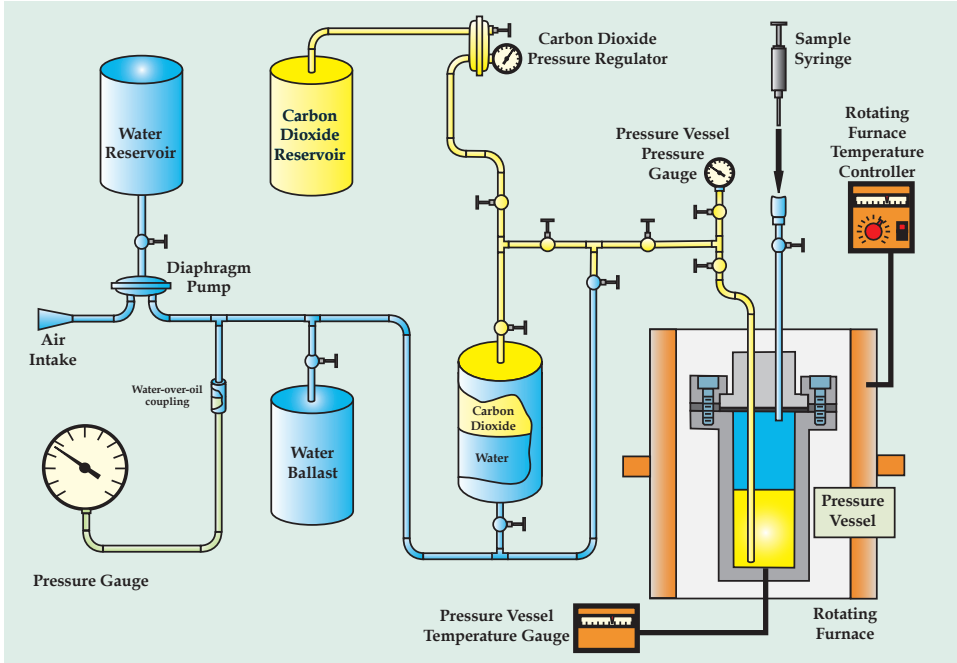
Carbon Dioxide Sequestration in Saline Aquifers

By Robert J. Rosenbauer

The USGS is pursuing research to reduce greenhouse gases in hopes of heading off global warming. **Bob Rosenbauer** of the Western Region Coastal and Marine Geology team (WRCMG) and **Jim Bischoff**, Scientist Emeritus with the Volcano Hazards team (formerly of WRCMG), have developed new technology to investigate the disposal of excess man-made carbon dioxide (CO_2). The burning of fossil fuel has caused a continuous increase of atmospheric CO_2 over the past 120 years. The role of CO_2 as a greenhouse gas and its potential effect on global climate have been well documented in the scientific literature, and its mitigation has been the subject of several recent national scientific meetings, such as the First National Conference on Carbon Sequestration held in Washington, DC, in May 2001. Powerplants are a major source of this excess CO_2, and although the capture of CO_2 is a proven technology, its disposal and storage remain problematic.

The team studying CO_2 sequestration at Menlo Park, CA, has been joined by **Tamer Koksalan**, a Stanford University graduate student who is working with Stanford organic geochemist **Mike Moldowan.** A Mendenhall Postdoctoral Fellow will be added to the team in FY03.

This group within WRCMG hopes to short-circuit the emission of CO_2 into the atmosphere by its geologic sequestration in deep-saline aquifers. In the sequestration process, CO_2 captured from powerplant or other emissions would be pumped into deep-saline aquifers to isolate it from the atmosphere. The depths of these aquifers provide pressures high enough to keep the CO_2 supercritical—in a single fluid phase with physical properties similar to those of a liquid rather than a gas. Some CO_2 will become dissolved in the aquifer and can react with other dissolved salts in the brines and wallrock to form carbonate minerals that will permanently fix part of the CO_2 as a rock. These aquifers are unsuitable as resources for drinking water.

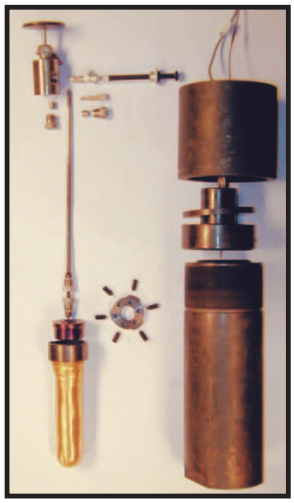


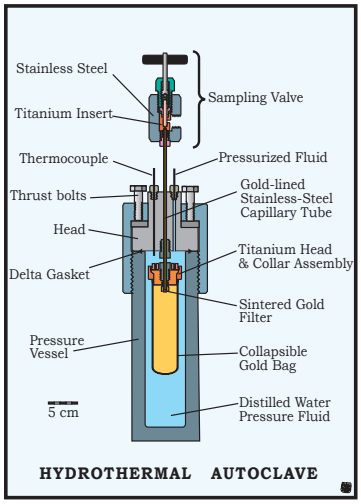
*Experimental scheme (drafted by **Bruce Rogers**, WRCMG) for determining the solubility of CO_2 in water and brines, using a fixed-volume reaction cell (labeled "Pressure Vessel" in diagram) and rotating furnace to simulate the pressures and temperatures of deep aquifers. Fluid or gas samples are withdrawn with a high-pressure syringe and transferred to a coulometer for CO_2 analysis.*

This process, which is one of several proposed disposal mechanisms, has the advantages of permanence (by fixation of CO_2 into carbonate minerals) and high capacity—there are many deep-saline aquifers of broad extent throughout the country. Many are located in regions with large coal-fired powerplants—a major source of excess CO_2. The WRCMG study involves experiments to determine the solubility of CO_2 in brines and the reactions between supercritical CO_2 and fluids and host rocks that are characteristic of deep-saline aquifers.

In the Water/Rock Interaction Laboratory, we adapted technology originally designed to study hydrothermal systems

(Carbon Dioxide continued on page 6)





*On the right is a schematic (drafted by **Bruce Rogers**) and on the left an exploded view of the experimental apparatus for studying the interactions of CO_2-charged fluids and potential aquifer host rocks. A rock sample and CO_2-charged brine are placed in the collapsible gold bag and subjected to temperatures and pressures typical of deep aquifers. We use the gold-lined exit tube and titanium sampling valve to withdraw samples of the fluid and monitor the progress of reactions during rock-water interactions.*

(Carbon Dioxide continued from page 5)

to the investigation of CO_2 sequestration. We designed and developed new reaction cells—containers in which we can mix components at different temperatures and pressures and observe the results—and new sampling and analytical procedures. The experimental scheme and new data on the solubility of CO_2 in brines were presented at special sessions of the spring and fall meetings of the American Geophysical Union (AGU) in 2001.

An important aspect of the experimental work is to provide kinetic and thermodynamic data for modeling efforts being conducted by **Yousif Kharaka** and **Jim Palandri** (USGS, Water Resources) and **Kevin Knauss** (Lawrence Livermore National Laboratory).

This project is part of a national effort by government, industry, and academia to limit and dispose of greenhouse gases. Partial funding is being provided by the USGS Energy Resources Program (ERP) under the umbrella project "Assessment of Geologic Reservoirs for Carbon Dioxide Sequestration" headed by **Bob Burruss** (ERP). Coincidentally, **Jon Kolak**, a recent postdoctoral researcher with WRCMG, is now a Mendenhall Postdoctoral Fellow with the Energy Resources team in Reston, VA; **Jon** will be working on the potential environmental effects of CO_2 sequestration in deep unminable coal beds and depleted oil reservoirs. We are cooperating with this work by adding methane, a greenhouse gas associated with coal and oil deposits, to our mix of experimental components. The U.S. Department of Energy (DOE) through the National Energy Technology Laboratory (NETL) is providing additional funding for some fundamental studies on supercritical CO_2 in which **Curt White**, **Sheila Hedges**, and **Don Harrison** (all at NETL) are collaborating with the USGS effort.❁

Outreach

Early Earth Day at a Florida Elementary School

By Dennis Krohn

Carrol Steakley from the Earth Savers Club of McMullen Booth Elementary School in Clearwater, FL, is highly organized and wanted to celebrate Earth Day early. She asked the USGS Center for Coastal and Regional Marine Studies (CCRMS) in St. Petersburg, FL, if we could come to the school on April 12. **Kathy Krohn**, a USGS Volunteer for Science, brought a large volcano model used at the center's open house last fall (see article in November 2001 issue of *Sound Waves*). The model is too big to fit into any of our field vehicles and had to be delivered in a special van.

Earth Day was held on the athletic field at McMullen Booth and was included as part of the day's curriculum for the 700 children. The event was well attended by local exhibitors. Rangers from Honeymoon Island State Park in Dunedin, FL, displayed local shells. A clerk from Lowe's Home Improvement Center's nursery helped students plant a seed and instructed them to keep the pot to watch the seed grow. Science Safari Adventures from Clearwater, FL, displayed some local fauna, and a representative from the city of Dunedin showed how the city cleans its water. Needless to say, the USGS was the only exhibitor to bring an active volcano, and it made quite an impression on the children raised in Florida!❁

*(Top left). **Kathy Krohn** demonstrates the USGS model of a stratovolcano to the children of McMullen Booth Elementary School for their Earth Day event.*

*(Bottom left). **Hannah Krohn** prepares an eruption of a smaller volcano model, dubbed Mount Rainbow, for her classmates on Earth Day.*

***Pam Stachurski** of the Gifted Program at McMullen Booth Elementary School and **Kathy Krohn** pose next to the volcano model. Earlier in the year, the USGS had been invited to give a special program on crystals to the Gifted Program students (see article in March 2002 issue of* Sound Waves*).*

Honduras Coral-Reef Documentary Online

By Trent Faust

Watch the documentary online at URL ***http://coastal.er.usgs.gov/education/mitch-movie/***

Map (top left) shows the path of Hurricane Mitch and locations of Roatán and Cayos Cochinos off the Caribbean coast of mainland Honduras. Aerial photograph (bottom left) shows location of coral-monitoring stations (yellow squares) in Cayos Cochinos Biological Reserve.

A new documentary short film is available online detailing work conducted by USGS scientists in St. Petersburg, FL, to assess the impact of Hurricane Mitch on coral reefs off the Caribbean coast of Honduras. The eight-and-a-half minute video, entitled "Coral Reefs in Honduras: Status After Hurricane Mitch," features geologist **Bob Halley** describing the assessment effort and its results. Aerial and underwater footage of the affected areas highlights the story.

Hurricane Mitch became the fourth strongest Atlantic hurricane on record on October 25, 1998, attaining top sustained winds higher than 180 mph and generating estimated wave heights of 50 ft (15 m). The powerful storm's path through Central America made it the deadliest hurricane since 1780, leaving more than 11,000 dead and 2 million homeless. On October 27 and 28, 1998, just before landfall in mainland Honduras, Hurricane Mitch, then a Category 4 hurricane packing maximum sustained winds of 130 mph, passed over coral reefs at Roatán and Cayos Cochinos.

In October 1999, **Bob Halley**, **Don Hickey**, and **Chris Reich** made their initial visit to assess the coral reefs (see related stories in the November 1999, May 2000, and January 2002 issues of *Sound Waves*). The storm appeared to have done little physical damage to the reefs. However, driven by heavy rainfall, influx of river-borne freshwater and nutrient-rich sediment onto the reefs had touched off widespread coral disease, particularly black-band disease.

But Mitch also surprisingly aided the reefs. The 1997-98 El Niño had raised sea-surface temperatures, stressing the corals and causing bleaching—expulsion of the symbiotic plantlike zooxanthellae that live within the coral tissue. Prolonged periods of bleaching may lead to increased coral fatality. In passing over the reef areas, Mitch reduced the water temperature by about 1°C, preventing a bleaching episode that killed as much as 50 percent of the live corals elsewhere in the Caribbean.

Terry Edgar provided the narration, and **Tim Holmes** produced the documentary. **Tim's** time in St. Petersburg was invaluable; he also produced the documentary short film "The Effects of Globally Transported African and Asian Dust on Coral Reef and Human Health" (also narrated by **Terry Edgar** and available online at URL **http://coastal.er.usgs.gov/african_dust/documentary/**) for the Coral Mortality and African Dust project. **Tim** has since returned to Los Angeles to resume work on his own film projects.

There's a Howling Good Time When Girl Scouts Meet USGS Biologists

Perhaps it was the "call of the wild," the recordings of coyote vocalizations playing in the background, that lured visitors to the USGS booth. More than 15,000 Girl Scouts from northern California and Nevada gathered with their families at the Girl Scouts' Tierra del Oro 90th Anniversary Celebration on a sunny Saturday afternoon at the Arco Arena in Sacramento, April 6. Many of them stopped to learn firsthand how USGS biologists conduct fieldwork. There to talk about research at the USGS Western Ecological Research Center were **Erin Boydston**, **Jennifer Shulzitski**, **Glenn Wylie**, and **Jeff Lovich**.

Erin and **Jennifer** discussed field research on birds and mammals in the San Francisco Bay region and explained how scientists can find a wealth of information about an animal's DNA, hormones, diet, and even where the animal has been just by analyzing its scats. **Glenn** described how giant garter snakes—a threatened species endemic to California's Central Valley wetlands—are individually marked so that scientists can radio-track them to learn more about each snake's activities and habitat use. **Jeff** talked about worldwide turtle declines and USGS studies on the western pond turtle and desert tortoise and California's native snakes. The scientists demonstrated the use of biologists' tools of the trade, such as radio-tracking equipment and global-positioning-system units that they use to learn more about wildlife activities and habitat. Before leaving, visitors could test their skills at identifying whalebones and antlers.

Jennifer Shulzitski *(left) and* ***Erin Boydston*** *(right) give Girl Scouts a closeup view of an albino common kingsnake* (Lampropeltis getulus). *The kingsnakes at the USGS booth represented three kingsnake species and are among 33 species of snakes native to California. (Only six California snake species are venomous, all rattlesnakes.) Many of the Girl Scouts who visited the booth took away digital-photo mementos of their snake encounters, made by* ***Jeff Lovich****. Photographs by* ***Glenn Wylie****.*

USGS Participates in University Job Fair

By Sandy Coffman

The USGS was once again well represented for the third consecutive year at the University of South Florida (USF)'s Geology Alumni Society's Job Fair. USGS representatives included **Sandy Kinnaman** (hydrologist, Altamonte Springs), **Barclay Shoemaker** (hydrologist, Miami), **Noreen Buster** (sedimentary geologist, St. Petersburg), **George Kish** (hydrologist, Tampa), **Nicole Elko** (coastal geologist, St. Petersburg), and **Chris Langevin** (hydrologist, Miami).

USGS representatives at University of South Florida (USF)'s Geology Alumni Society's Job Fair. From left to right, ***Sandy Kinnaman****,* ***Barclay Shoemaker****,* ***Noreen Buster****,* ***George Kish****, and* ***Nicole Elko****.*

The focus of the job fair was to expose students to the professional opportunities they face upon graduation. Many exhibitors collected résumés, conducted preliminary interviews, or scheduled formal interviews. That approach was inappropriate for the USGS, however. Our goal was to educate the students about the diverse opportunities offered by the USGS. We provided information on how to search for Federal jobs, including specifics on the Online Automated Recruitment System (OARS) used by the USGS, the different types of scientist employed by the USGS, and the different types of employment offered, including career-conditional appointments, term appointments, and contracts.

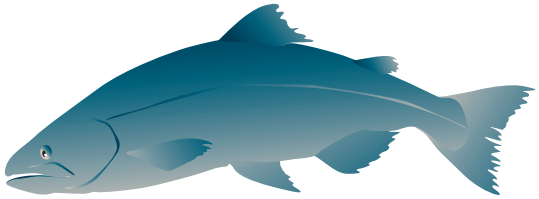
Lecture on National Implications of Sea-Level Rise and Other Coastal Hazards

By Becky Deusser

A complex assortment of factors—such as geologic framework, storms, sand budgets, and relative sea-level rise—control the dynamics of coastal regions. Under the influence of these factors, approximately 80 percent of U.S. coastal regions are undergoing long-term marine transgression, resulting in net erosion, land loss, and, commonly, property damage. Coupled with this threat is the fact that more than half of the Nation's population lives in the coastal zone, and the increase in coastal population and development continues to accelerate. The existing crisis along America's coasts is likely to deepen as more people move to vulnerable low-relief regions and hazards increase over the next century as a result of climate warming.

To explain and communicate coastal processes and sea-level rise and other hazards looming for the Nation, the Coalition for Buzzards Bay invited **Jeff Williams** of the USGS Woods Hole Field Center (WHFC) to be a speaker with **Graham Giese** of the Woods Hole Oceanographic Institution (WHOI), at their evening lecture series, "Sea-Level Rise: Implications for Buzzards Bay," on April 10 in Woods Hole, MA. About 100 people attended the 90-minute lectures.❁

USGS Briefs Massachusetts Coastal Managers on Sea-Level Rise and Other Coastal Hazards



By Becky Deusser

In comparison with other regions in the Nation, Massachusetts has a moderate but varying risk from such coastal hazards as storms, long-term erosion, effects of coastal-engineering structures (such as jetties and seawalls that increase local erosion rates), and sea-level rise. Conserving and managing the State's shoreline, wetlands, and estuaries are high priorities for the Massachusetts Office of Coastal Zone Management (CZM). **Tom Skinner**, director of the CZM, invited **Jeff Williams** (Woods Hole Field Center) to meet with the staff and present a seminar on March 26, 2002.

The seminar covered the current state of scientific knowledge about coastal hazards and past sea-level rise, future predictions based on the Intergovernmental Panel on Climate Change (IPCC)'s 2001 findings, and implications for public policy. **Jeff's** talk presented the results of USGS research on coastal processes, such as SWASH (Surveying Wide-Area Shorelines) mapping, sea-floor mapping, and a new study with the National Park Service on assessing the vulnerability of coastal parks to global sea-level rise. Following the presentation was a lively period of questions and discussion.❁

New Directions in the Earth Sciences and the Humanities

By Fran Lightsom

Fran Lightsom of the Woods Hole Field Center (WHFC) attended a workshop sponsored by the New Directions Initiative on March 22 to 24 at the Columbia University Biosphere2 Conference Center in Oracle, AZ. The workshop brought together scientists, scholars, and managers from universities, government agencies, and nongovernmental organizations, as well as a producer of a multimedia production company. Among the group were members of seven interdisciplinary research teams that will continue working through the year.

One New Directions team, "Visualizing a Gulf of Maine Digital Library," includes **Lightsom**, **Fausto Marincioni**, and **Tom Aldrich** (WHFC); **Chris Brehme** and **Nathan Michaud** of the Island Institute in Rockland, ME; and **Paul Schroeder**, **Michael Hermann**, **Jennifer Pixley**, **Jefferson White**, and **Michael Grillo** of the University of Maine, Orono.

The other interdisciplinary teams are also working on water-related projects, including communication between scientists and coastal communities, management of urban waterways, management of salmon restoration, and evaluation of the use of models in creating water policy.The workshop enhanced cooperation among the New Directions teams, especially those working on communication between marine scientists and the residents of coastal communities. All seven teams also serve as case studies in developing skills and techniques for addressing interdisciplinary environmental problems.

USGS participation in the Gulf of Maine Digital Library team supports two Coastal and Marine Geology Program (CMGP) projects. For the Regional Synthesis project, the team will contribute to a future regional synthesis for the Gulf of Maine. The digital library work on information organization and access is a primary concern of the CMGP's National Knowledge Bank project.

The goal of the New Directions Initiative is to encourage truly interdisciplinary approaches to environmental problems. New Directions is based at the Colorado School of Mines in Golden, CO, and sponsored by the National Center for Atmospheric Research (NCAR), the National Aeronautics and Space Administration (NASA), the National Endowment for the Humanities, the National Science Foundation (NSF), the U.S. Environmental Protection Agency (EPA), and the USGS. More information can be found on their Web site at URL **http://www.mines.edu/newdirections/index.htm**.❁

Floating Support Facility—a Boat Only a Scientist Could Love

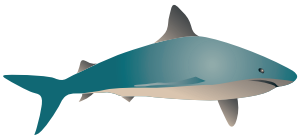
By Dennis Krohn and Kim Yates

A new houseboat, dubbed the *SHARQ Express* by **Kim Yates** of the USGS' St. Petersburg Center for Coastal and Regional Marine Studies (CCRMS), is designed to be a mobile support facility for measuring benthic-community metabolism using the SHARQ—the Submersible Habitat for Assessing Reef Quality. The SHARQ's clear tent traps water over a sea-floor habitat, such as a coral reef, and allows investigators to measure changes in the chemistry of the trapped water caused by the metabolism of the organisms inside the tent. (For more information about SHARQ, visit the Web site at URL **http://sofia.usgs.gov/publications/ofr/00-166/**.)

The new boat designed to support SHARQ research was custom built to **Kim's** specifications by Clark Boats of Iowa. Its unconventional design features two onboard generator systems, a backup suitcase system (a small, portable generator), a laboratory area for performing real-time analysis, a head and shower, sinks, bunks, a small galley, and other amenities necessary for 24-hour monitoring and experiments. The boat sleeps four people.

Kim Yates *stands on the forward deck of a new floating laboratory before its maiden voyage on April 8.* ***Iuri Herzfeld*** *(left) and* ***Nate Smiley*** *(right) are assisting* ***Kim*** *in the staging area of the USGS' St. Petersburg Center for Coastal and Regional Marine Studies. Note equipment-storage area on top.*

In past years, various platforms have been rented or constructed for SHARQ work, ranging from houseboats to scaffolding. The new houseboat platform, permanently outfitted with SHARQ system components, will eliminate costly rental fees and the logistical difficulties of having to customize SHARQ surface components each time a different support vessel is used. The initial cruise will last 9 days and perform research on Tampa Bay for the Tampa Bay Integrated Science Project. The SHARQ system is routinely used for Tampa Bay, Florida Bay, and Biscayne Bay benthic-habitat monitoring and experimentation.❁



Woods Hole Field Center Runners Place in Road Race

By Becky Deusser

Three runners from the Woods Hole Field Center (WHFC) placed in the 25th Annual Seagull Six 5.74-mile Road Race in Woods Hole, MA, on April 7, 2002. **Jeff List** finished second in the M40 age group, placing 7th out of 122 overall. **Michael Casso** was seventh in the M30 group, placing 26th out of 122 overall. **Richie Williams** finished second in the M60 age group, placing 36th out of 122 overall. The Falmouth Track Club has staged the race since 1978. A 2.5-mile noncompetitive walk was held in conjunction with the event to raise money for women's health programs in Falmouth, MA.❁

Judd A. Howell Takes the Reins of the USGS' Patuxent Wildlife Research Center

By BH Powell

Judd A. Howell, formerly of the USGS' Western Ecological Research Center, is the new center director for Patuxent, the world's premier wildlife-research center.

Judd was born in Manhattan, NY, but grew up in western New Jersey and Montana. He received a B.S. degree in zoology from Montana State University; an M.S. degree in zoology from Arizona State University; and a Ph.D. in wildland resource science (wildlife ecology) from the University of California, Berkeley. His varied career encompasses assignments and research associated with Bitter Lake National Wildlife Refuge in New Mexico; the Bureau of Land Management near Lewistown, MT; the Bureau of Reclamation in the North Platte River region of Wyoming; the Golden Gate National Recreation Area and Point Reyes National Seashore in California; the National Biological Survey; and the USGS' Western Ecological Research Center.

Judd is the author or coauthor of numerous professional papers focusing on animal behavior, population, and wildlife ecology. He has been a field associate for the California Academy of Sciences and an affiliate associate professor in the Wildlife and Fisheries Department at the University of Idaho; he is currently an adjunct professor in the Wildlife Department at Humboldt State University.

Judd and his wife, **Nancy**, will make their home in Annapolis, MD, and continue to cultivate their hobbies of mountain biking, travel, wildlife photography, and sailing.❁

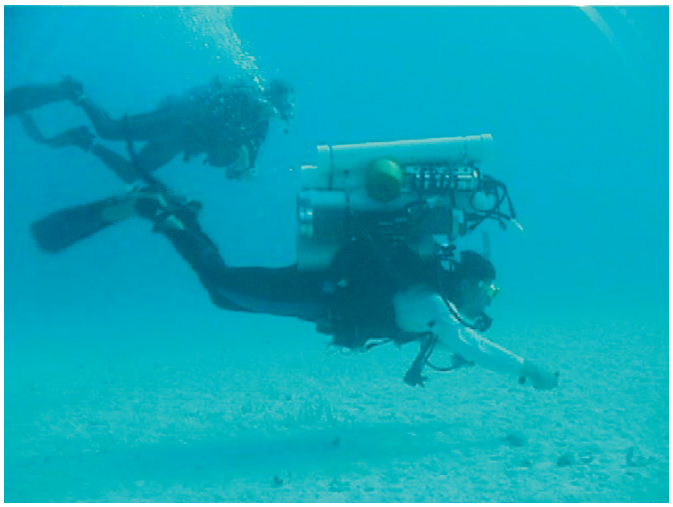
Emmanuel Boss Speaks About Water-Column Optics in St. Petersburg, FL

By Tonya Clayton

The USGS' Center for Coastal and Regional Marine Studies (CCRMS) and the University of South Florida (USF)'s College of Marine Science were pleased to welcome **Emmanuel Boss** to St. Petersburg for a series of April talks on water-column optics and their relation to benthic processes. **Emmanuel**, a professor of marine science at the University of Maine, is no stranger to the USGS; he collaborates with **Brian Bergamaschi** (USGS, Water Resources) on sediment-transport research in the Sacramento River. This was **Emmanuel's** first visit to the St. Petersburg center.

Emmanuel's first talk addressed "Particulate and Dissolved Properties Inferred from *in situ* Optical Measurements." This presentation served as a general introduction to the utility of bulk optical measurements in elucidating processes and properties of interest to the USGS. Richly illustrated with data from **Emmanuel's** own research in a wide variety of environments, this talk was well attended by a diverse crowd from not only CCRMS but also the USF's College of Marine Science and the USGS' Water Resources office in Tampa.

Emmanuel's second talk, hosted by **Ken Carder** of the USF's College of Marine Science, focused on "Effect of Bottom Substrate on Inherent Optical Properties: Evidence of Biogeochemical Processes." In this talk, **Emmanuel** presented his recent work with the U.S. Navy's Coastal Benthic Optical Properties field experiment at Lee Stocking Island in the Bahamas. There, **Emmanuel** and his colleagues found that inherent optical properties—measures of how the seawater and materials in it scatter and absorb light—can vary widely and depend on bottom type (for example, sea grass versus coral reef). This finding has important implications for USGS efforts to model the underwater light field and to interpret remotely sensed images of submerged bottoms.



Emmanuel Boss *(University of Maine) measuring inherent optical properties in the near-bottom waters of Lee Stocking Island, Bahamas. His dive buddy,* ***Ron Zaneveld*** *(Oregon State University), is visible in the background. Photograph courtesy of* ***Emmanuel Boss****.*

We look forward to more of **Emmanuel's** high-energy research! ☸

Deputy Regional Director Visits Woods Hole Field Center, Speaks About Special Emphasis Program (SEP)

By Jamey M. Currence

Pam Malam, deputy regional director for the Eastern Region, visited the Woods Hole Field Center (WHFC) on April 2, 2002. **Pam** is also the management representative for the Eastern Region's Special Emphasis Program Advisory Committee (SEPAC), established by Deputy Director **Kathy Clement** in June 2001. **Pam** gave an overview at the center's monthly meeting on the Special Emphasis Program (SEP) and on the Eastern Region's perspective in relation to science, quality of worklife, and other management-related issues.

The SEP is a dynamic and exciting new program that works in support of USGS management to promote diversity within the USGS, which is reflective of the Nation's citizenry. The SEPAC comprises one headquarters and three regional teams that consist of liaisons to eight special-emphasis groups, and a management representative with oversight by an executive board. The eight SEP groups are Women, Hispanics, Persons with Disabilities, African Americans, Gays/Lesbians/Bisexuals, Native Americans/Alaska Natives, Asian Americans/Pacific Islanders, and Multicultural/Multiracial/Other.

The major functions of the SEP include the following:

- Analyzing policies, practices, and procedures that may present barriers to the recruitment, retention, development, and advancement of target groups,
- Maintaining internal and external networks to gather information, increase awareness, and enhance expertise, and
- Educating and informing others about SEP activities.

The first year of this effort has included establishment, training, building networks within and outside of the USGS, communications planning, and analyzing priority issues.

Pam also enjoyed a show-and-tell session on projects taking place at WHFC. **Page Valentine** outlined the center's habitat-mapping efforts, showing examples from Stellwagen Bank and Georges Bank and emphasizing our relationship with collaborators, such as the National Oceanic and Atmospheric Administration (NOAA)'s National Marine Fisheries Service (NMFS). **Jane Denny**, **Tommy O'Brien**, **Bill Danforth**, and **Ken Parolski** gave **Pam** a tour of the sea-floor-mapping vans and equipment. **Jeff List** talked to her about coastal erosion and

(SEP continued on page 12)

(SEP continued from page 11)

how researchers collect information using the SWASH (Surveying Wide-Area Shorelines) buggy. **Ellen Mecray** gave **Pam** a tour of the geochemistry labs. **Pam** said of her visit: "Please let those who spoke with me about their projects and activities know that I appreciate their hospitality. Everyone did a great job of explaining what they're working on and why. I learned a lot."

Note: The Eastern Region SEPAC currently has two vacancies for the Native American/Alaska Native and Asian American/Pacific Islander groups. Please contact **Jamey M. Currence**, ER SEPAC Chairperson, at **jcurrence@usgs.gov** or 508-457-2204 for more information.❁

Eastern Region Special Emphasis Program Advisory Committee (SEPAC) members: Front row (left to right) ***Regina Lanning, Imogene Bynum, Jamey Currence, Pam Malam****; back row (left to right)* ***Lee Fowler, Ted Campbell, Debra Foster, John Elder****.*

New Employees Join the Western Region Coastal and Marine Geology Team

Several new employees have joined the Coastal and Marine Geology team in the Western Region. **Amy Foxgrover** and **Bob Peters** came onboard in March on term appointments. They are working in Santa Cruz, CA, for **Bruce Jaffe**. **Amy** does Geographic Information Systems (GIS) modeling for the San Francisco Placed-Based project. She received a B.S. degree in environmental studies, with an emphasis on GIS, from the University of California, Santa Barbara, in 2000. **Amy** was an Environmental Careers Organization (ECO) intern with the San Francisco Bay Historical Sedimentation project from August 2000 until March 2002. **Bob** is a geologist studying tsunami deposits for the Tsunami Risk Assessment project; he has been working with the project since October 2000. **Bob** received an M.S. degree in earth sciences from the University of California, Santa Cruz, in 2000.

Margaret Hampton joined the team in January 2002 as an ECO intern. A geologist for the San Francisco Placed-Based project, **Margaret** received a B.S. degree in earth sciences from the University of California, Santa Cruz, in 2000. She is working with **Bruce Jaffe** on identification of mercury-contaminated hydraulic-mining debris in northern San Francisco Bay and with **David Rubin** and **Noah Snyder** on seasonal grain-size variations in Suisun Bay, in the northeastern section of the San Francisco Bay watershed. **Margaret** became interested in studying geology when she was in the Education Abroad Program (EAP) at the University of British Columbia in Vancouver, Canada.

Michelle Lopez was hired on a term appointment to work with **Jim Hein**. **Michelle** studied marine geochemistry and mineralogy at the Rosenstiel School of Marine and Atmospheric Sciences, University of Miami, Florida, where she worked for **Peter Swart**. After leaving Miami, **Michelle** studied archeology at the University of Illinois, Urbana-Champaign, where she has finished all the requirements for a Ph.D. except the thesis (which is how she'll be spending her evenings for the next several years!). **Michelle** is stationed in Menlo Park, CA. Her duties on the Coastal and Marine Geology team include managing the mineralogy lab; processing samples and running the X-ray diffraction (XRD) machine; analyzing XRD data; processing mineralogic, geochemical, and isotopic data and providing statistical analyses of those data; doing computer graphics; and doing some writing—all applied to our contaminant and mineral studies. **Michelle** also provides other members of the team with XRD data as needed for their projects.❁

New USGS Mendenhall Fellow Presents Talk at Woods Hole Field Center

By Debbie Hutchinson

Brandon Dugan of the Pennsylvania State University presented a talk entitled "Fluid Flow and Stability of the New Jersey Continental Slope" at the Woods Hole Field Center on April 17, 2002. **Brandon**, who is finishing his Ph.D. this fall, will join the USGS as a Mendenhall Postdoctoral Fellow in the late fall or winter. **Brandon** plans to use his background in geophysics, computer modeling, and civil engineering to study fluid flow and gas-hydrate occurrence in the Gulf of Mexico. His dissertation advisor**, Peter Flemming**, spoke at the Woods Hole Oceanographic Institution geodynamics seminar in early March. **Peter's** presentation included some of **Brandon's** results. **Brandon** gave an overview of his dissertation research, followed by an informal discussion about his experiments and models and their application to continental-margin problems.❁

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