

# Life Around Us!!

## NCSU Scientists Collect Carbon During Sea Cruise Off Antarctica

By Maggie Adams  
NCSU News Service

A geochemist and three graduate students at North Carolina State University will sail the icy waters off Antarctica collecting sediment from the nutrient-rich Ross Sea.

The goal of the research is to learn more about the nutrient cycles of carbon and silicon and their ultimate role in global climate and the "greenhouse effect," and to obtain a sedimentary record of glacial activity and climatic changes in the past.

The National Science Foundation (NSF) is providing a \$360,000 grant for the three-year research project. The project is part of the NSF's United States Antarctic Program, which this year includes 90 research teams along with supporting operations.

Dr. David J. DeMaster, principal investigator for the nutrient cycle project and associate professor of marine, earth and atmospheric sciences at NCSU, will be making his fourth trip to the icy continent.

"It's a surrealistic experience," DeMaster said. "It's very different from anything else you might be used to. There's the Ross Ice Shelf, a mountain of ice that rises 300 to 400 feet out of the ocean, and lots of penguins, whales and seals, and the science is equally as exciting, interesting and very different."

DeMaster and NCSU graduate students Robert H. Pope, Stephen L. Harden and Susan Boehme flew to Christchurch, New Zealand, in late December. A few days later, they boarded a U.S. Navy transport plane for the nine-hour flight to McMurdo Station, the U.S. Navy base in Antarctica.

All of the group will be wearing full survival gear in the event the plane goes down. Without the special clothing, survival in the frigid waters would be limited to 10 minutes.

The research party — which also includes 22 scientists and graduate students from Rice University, the University of Tennessee, Oregon State

University and the State University of New York at Stony Brook — will rendezvous with the Polar Duke, an icebreaking research ship which is sailing to the Ross Sea from Punta Arenas, Chile. A helicopter or tracked vehicle may be needed to take the researchers and their equipment to the ice edge at the Ross Sea.

The researchers also will wear survival gear while working on the deck of the Polar Duke. "If anyone would fall overboard in street clothes, they'd never survive," DeMaster said. But, since precautions are taken to reduce the risk, the trip is safe, he said.

Working 16 to 20 hours a day, the scientists will collect various types of sediment cores from sediments in the northwest and southwest Ross Sea and measure the dissolved nutrients, including silica, carbon, nitrate, nitrite, ammonia, sulfate and phosphate. They hope to determine how rapidly silica and organic carbon accumulate in the seabed. Silica forms the hard parts of most marine plants in the Antarctica. After the plants die, the skeletal remains accumulate in the seabed along with organic carbon.

The high latitudes (those near the earth's poles) are very important in terms of the nutrient cycle, said DeMaster, who has been studying carbon and nutrient uptake and their relationship to the "greenhouse effect" in various parts of the world.

About one-third to one-half of all photosynthesis (converting carbon dioxide into organic carbon and oxygen) is conducted by marine plankton, DeMaster said. These tiny marine animals and plants help remove carbon dioxide from the air, a factor in limiting the "greenhouse effect," he said.

During the summer (winter in the Northern Hemisphere) in high latitudes where the plentiful nutrients at the ice edge are bathed in sunlight 24 hours a day, the well-fed plankton and algae "go crazy and grow very fast," DeMaster said. As a result, so-called algae blooms in the

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PISA, ITALY — Tourists line up to visit the Leaning Tower of Pisa. The famed landmark is losing so important structural repairs can be made. (UPI Photo)

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### Research Done At Topsail Island Study Shows Bulldozing May Protect Property Without Damaging Beaches

CHAPEL HILL — Using bulldozers to rebuild dunes on coastal beaches hit by storms such as Hurricane Hugo can help protect property without damaging beaches, a study conducted at the University of North Carolina Institute of Marine Sciences suggests.

The controversial technique may offer a short-term solution to controlling erosion while still allowing the onshore migration of sand that rebuilds beaches naturally after storms, UNC scientists say.

It also may offer a compromise between environmentalists who say nature should be allowed to take its course and developers and homeowners who want to "harden" beaches with jetties and seawalls to protect investments.

Jesse McNinch, a graduate student at UNC now employed as a geologist at an environmental consulting firm in Los Angeles, recently completed the research at Topsail Island under the direction of Dr. John Wells, associate professor of marine sciences.

They believe the study is the only work of its kind ever done in North Carolina and one of the few conducted in the United States.

"One has to be cautious in drawing conclusions from a study in one area and applying them broadly since beaches are very complex systems," Wells said.

"What works on one beach may not work at another."

"Still, this study suggests bulldozing sand may be the only acceptable means of protecting property, one that takes pressure from property owners off state and local governments."

Beginning in September 1988, McNinch set up a series of markers at Topsail Beach, where heavy machinery was not used to pull sand up from the lower beach and identical markers where bulldozer scraping was carried out.

Using surveying equipment, he then monitored levels of sand surrounding each marker every two weeks for a year.

"That allowed me to compare the shape of the beach over time and to calculate the volume of sand in the dunes and on the beach," McNinch said. "During 12 months, we had erosion from a northeaster last year and also from Hurricane Hugo this year."

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"The challenge that we face today is to make...  
*the world one in terms of brotherhood.*"

From the sermon at The Washington Cathedral, March 31, 1968.

Dr. Martin Luther King, Jr.  
January 15, 1990



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