

The **Crest**

Current Issues in
Coastal Ocean and
Estuarine Science

Scientists Discover New Life in Antarctic Deep Sea

An international research team including VIMS Professor Robert Diaz has found hundreds of new marine species in the vast, dark deep-sea surrounding Antarctica—the bottom of the bottom of the world. Carnivorous sponges, free-swimming worms, crustaceans, and molluscs living in the Weddell Sea provide new insights into the evolution of ocean life.

Reporting in the May 17 issue of the journal *Nature*, the scientists describe how creatures in the deeper parts of the Southern Ocean—the source for much of the deep water in the world ocean—are likely related to animals living in both the adjacent shallower waters and in other parts of the deep ocean.

A key question for scientists is whether shallow-water species colonized the deep ocean or vice versa. The research findings suggest that recurring advances of Antarctic ice may have forced shallow-water organisms into

the surrounding depths, leading to an intermingling of species that originated in shallow and deep-water habitats.

Lead author Professor Angelika Brandt from the Zoological Institute and Zoological Museum, University Hamburg, says “The Antarctic deep sea is potentially the cradle of life of global marine species. Our research results challenge suggestions that deep-sea diversity in the Southern Ocean is poor. We now have a better understanding of the evolution of marine species and how they can adapt to changes in climate and environments.”

Diaz says the team’s most significant finding is the unexpected vitality and diversity of the seafloor community in a setting that would seem to hold little promise for life—with water temperatures at 30-34°F, total darkness, and bone-crushing pressure. The expedition sampled at depths from 3,000 to more than 20,000 feet.

“We discovered hundreds and hundreds of new species,” says Diaz. He was particularly struck by the diversity of isopods, small crustaceans related to pill bugs. “Sampling at just 25 stations doubled the number of known deep-sea isopod species.”

Diaz’s role in the international expedition was to characterize and photograph the habitats of the area’s bottom-dwelling creatures. His photograph of a sea urchin, taken in the Scotia Sea at a

depth of 6,414 feet, graced the cover of *Nature* issue in which the research article appeared.

Dr Katrin Linse, a marine biologist from the British Antarctic Survey, adds, “What was once thought to be a featureless abyss is in fact a dynamic, variable, and biologically rich environment. Finding this extraordinary treasure trove of marine life is our first step to understand-

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VIMS to Assess Social and Economic Value of Menhaden

A new three-year study led by researchers at VIMS seeks input from commercial and recreational anglers and other stakeholders to help assess the social and economic value of menhaden in Chesapeake Bay.

The socioeconomic study complements several ecological studies of menhaden populations in Chesapeake Bay by fisheries researchers at VIMS.

Menhaden are small, oily fish that lie at the center of a debate concerning their relative importance to the Bay ecosystem and economy. Menhaden support one of the most commercially important fisheries along the Atlantic Coast, providing fish meal, fish oil, and bait for other fisheries. They also play an important ecological role, filtering Bay waters by consuming large quantities of plankton, and serving as a favorite food for striped bass and other popular game fish.

The study, by VIMS researchers Jim Kirkley, Tom Murray, Winnie Ryan, and Dennis Taylor, will compare menhaden’s economic contributions

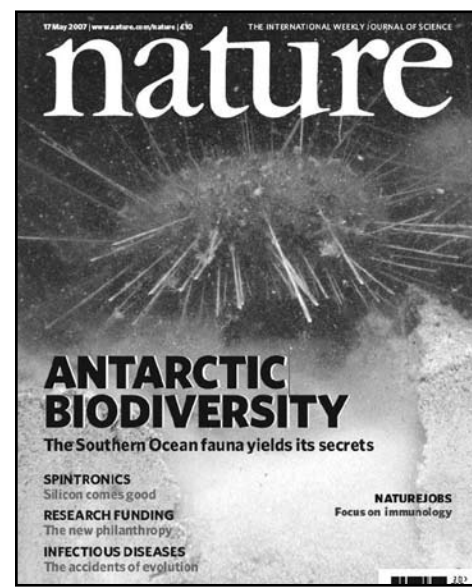
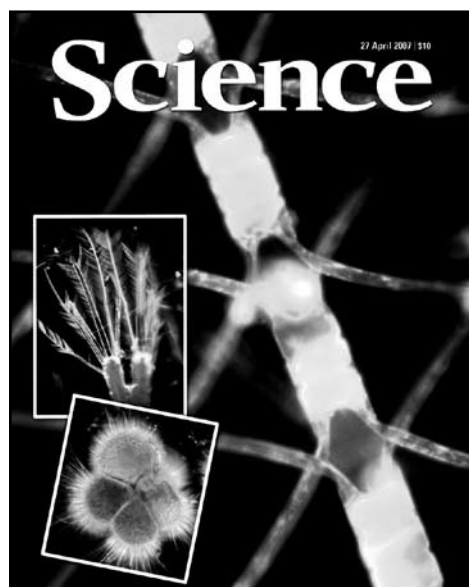


The Atlantic menhaden *Brevoortia tyrannus*.
Photo by Julia Ellis.

both in terms of the commercial fishery and the “ecosystem services” that menhaden provide. Assisting in the study are researchers Rob Hicks (College of William and Mary); Doug Lipton, Ted McConnell, and Ivar Strand (University of Maryland); and John Duberg of the Nearing Group (Baltimore, MD).

The study will also assess the importance of menhaden to the viability of the communities that depend on the fish for their livelihood. Those include Reedville, Virginia, home to the Chesapeake Bay’s commercial menhaden fleet and processing facilities, and Deltaville, home to a recreational charter fleet that

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VIMS scientists were co-authors of research articles that graced subsequent covers of *Science* and *Nature* this spring. The April 27 *Science* cover shows plankton from the VERTIGO project in the northeastern Pacific. Assoc. Prof. Deborah Steinberg co-wrote the VERTIGO paper (see vims.edu/topstories). The May 17 *Nature* cover was photographed by Professor Robert Diaz in the Scotia Sea, Antarctica (see story this page).

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ing the complex relationships between the deep ocean and the distribution of marine life.”

The *Nature* study reports the findings of the ANDEEP project (ANt-arctic benthic DEEP-sea biodiversity), a series of three expeditions to the

Southern Ocean between 2002 and 2005 aboard the German research ship *Polarstern*. An international team from 14 research organizations investigated the seafloor to build a picture of this little known region of the ocean. They found more than 700 new species.

In addition to Dr. Diaz, VIMS graduate student Lawrence Carpenter also took part in the research.