

LOCAL NEWS



Juan Acosta, an oceanographer with the Spanish Institute of Oceanography, shows a sonar "picture" of the ocean floor near the Puerto Rico trench, where the North American and Caribbean plates meet.

STAR photo
by Francesca von Rabenau

Oceanographers defend P.R. plate eastward slide

Mapping expedition strengthens theory on Caribbean plate

By CHRIS HAWLEY
of The Star Staff

Puerto Rico is an island on the move — about two centimeters a year, in fact, and due east.

Oceanographers on a Spanish research ship say eight days of mapping the ocean floor off the island's northeast shore have strengthened theories that Puerto Rico and other Caribbean islands are slowly moving well, out of the Caribbean.

Scientists have long known that the part of the earth's crust that carries North America is slowly diving under the plate that carries the Caribbean. But for years, they have debated whether the two plates are also slipping horizontally along the Puerto Rico Trench, a line about 60 miles north of the island where the plates meet.

The new data seems to show they are, and that the Caribbean plate is sliding on top of the North American plate to the east. As it goes, it carries Puerto Rico and the rest of the

Antilles further into the Atlantic, said Uri ten Brink, an oceanographer with the U.S. Geological Survey.

"We can now say with more certainty that the plates are not just being bent under, but that there is also this sideways movement as well," ten Brink said. "We have a much better idea now of what's going on."

The trip also confirmed suspicions that limestone built up in reefs around Puerto Rico and the U.S. Virgin Islands has tumbled down toward the trench in huge underwater landslides. Researchers also located a spot about 40 miles north of Arecibo where gravity is the lowest of anywhere on Earth, indicating something is pushing down the crust there.

Ten Brink and other scientists rode the *Hesperides*, an icebreaker outfitted with the latest sonar equipment, as it made four passes last week over the trench.

Equipment on the boat beamed sound waves at the ocean floor three to five miles below it, then read the reflections to create a map of the scars and folds caused by the colliding plates.

Scientists also probed beneath the ocean floor by setting off underwater air cannons, then reading the echoes

with a two-mile-long string of microphones towed behind the boat.

The echoes created a cross-section of the trench that shows the border of the North American Plate is not smooth where it cuts under the Caribbean Plate, ten Brink said. That is another indication that the plate is moving sideways, he said.

The cross-section also shows how limestone, created by coral reefs at depths of 50 feet to 100 feet, has crumbled and slid as deep as three miles into the trench.

Scientists said the area has been studied before, but never in such detail.

"Boats have come here before, but never with this kind of technology," said Juan Acosta, a researcher from the Spanish Institute of Oceanography. "There are only three or four boats in the world with this capability, and it is a rare opportunity to get to use them."

The boat normally does studies in the Antarctic until Spring, then heads home to Spain, crew members said. On the way, it stops in different areas to help with studies in other countries.

Scientists said they had hoped to spend two more days over the trench, but could not fit it into the boat's schedule.

Low gravity point found 50 miles north of Arecibo

By the STAR Staff

Scientists have discovered a dieter's dream — a place where you weigh less than anywhere in the world, right off the north coast of Puerto Rico.

Oceanographers studying the Puerto Rico Trench, a geological fault north of the island, say they have found a 10-mile-wide spot about 50 miles north of Arecibo where gravity is lower than anywhere else on the globe.

There, each kilogram weighs about .03 grams less, said Uri ten Brink, an oceanographer with the U.S. Geological Survey.

A 150-pound person would weigh about 2 grams less — about the weight of a pair of light earrings.

"It's not like you would be able to feel it — only instruments can detect it — but it's there," ten Brink said.

Ten Brink said scientists discovered the anomaly with the help of satellites that can detect tiny differences in the force of gravity.

Since gravity is caused by mass, geological trenches have less gravity because they are filled with water, which is less dense than rock, ten Brink said. Gravity is strongest on top of mountains, where the huge amount of rock causes a greater pull.

Scientists were surprised to find that the gravitational bump was not in the center of the trench, as expected, but south of it. That seems to indicate that something is pushing the crust down in that area, he said.