

Seals take scientists to Antarctic's ocean floor

Pauline Askin, Reuters

(Reuters) - Elephant seals wearing head sensors and swimming deep beneath Antarctic ice have helped scientists better understand how the ocean's coldest, deepest waters are formed, providing vital clues to understanding its role in the world's climate.

The tagged seals, along with sophisticated satellite data and moorings in ocean canyons, all played a role in providing data from the extreme Antarctic environment, where observations are very rare and ships could not go, said researchers at the Antarctic Climate & Ecosystem CRC in Tasmania.

Scientists have long known of the existence of "Antarctic bottom water," a dense, deep layer of water near the ocean floor that has a significant impact on the movement of the world's oceans.

Three areas where this water is formed were known of, and the existence of a fourth suspected for decades, but the area was far too inaccessible, until now, thanks to the seals.

"The seals went to an area of the coastline that no ship was ever going to get to," said Guy Williams, ACE CRC Sea Ice specialist and co-author of the study.

"This is a particular form of Antarctic water called Antarctic bottom water production, one of the engines that drives ocean circulation," he told Reuters. "What we've done is found another piston in that engine."

Southern Ocean Elephant seals are the largest of all seals, with males growing up to six meters (20 feet) long and weighing up to 4,000 kilograms (8,800 lbs).

Twenty of the seals were deployed from Davis Station in east Antarctica in 2011 with a sensor, weighing about 100 to 200 grams, on their head. Each of the sensors had a small satellite relay which transmitted data on a daily basis during the five to 10 minute intervals when the seals surfaced.

"We get four dives worth of data a day but they're actually doing up to 60 dives," he said.

"The elephant seals ... went to the very source and found this very cold, very saline dense water in the middle of winter beneath a polynya, which is what we call an ice factory around the coast of Antarctica," Williams added.

Previous studies have shown that there are 50-year-long trends in the properties of the Antarctic bottom water, and Williams said the latest study will help better assess those changes, perhaps providing clues for climate change modeling.

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"Several of the seals foraged on the continental slope as far down as 1,800 meters (1.1 miles), punching through into a layer of this dense water cascading down the abyss," he said in a statement. "They gave us very rare and valuable wintertime measurements of this process."

(Reporting by Pauline Askin, Editing by Elaine Lies and Michael Perry)

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