Article of the Week Due: 1-10-20

newsela Name: Period:

Seals with high-tech hats are collecting climate data in the Antarctic

By Smithsonian, adapted by Newsela staff on 12.18.19
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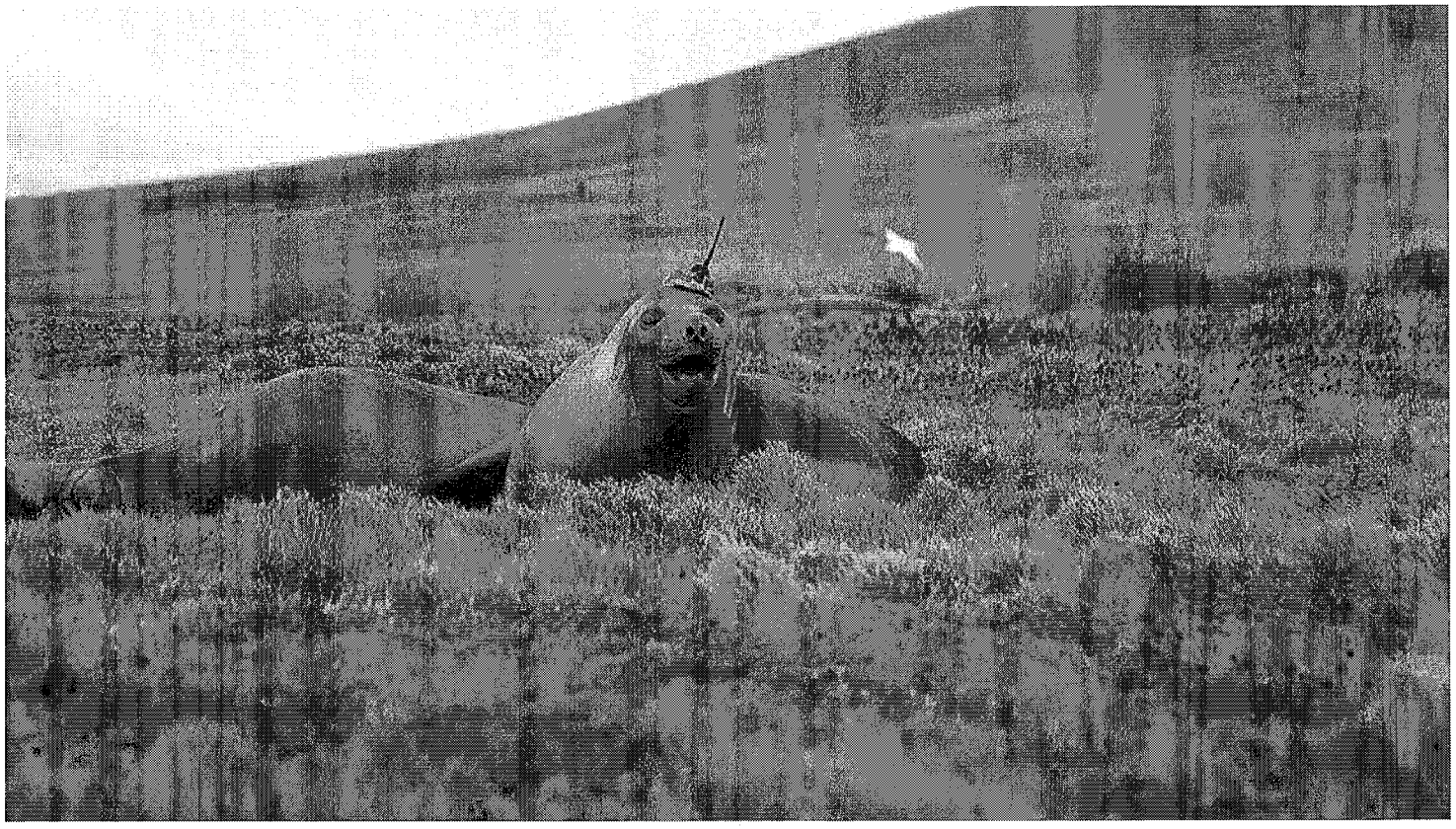


Image 1. An elephant seal outfitted with specialized sensors that helped researchers track how heat moves through ocean currents. Photo by: Etienne Pauthenet/Sorbonne University

Elephant seals in funny-looking hats are helping NASA. NASA is the National Aeronautics and Space Administration. It is America's space agency.

NASA is using the seals to study climate science. Most scientists agree climate change has been caused by humans. It has resulted in dangers to the Earth, including warmer temperatures and rising seas.

Special Caps Track Water Temperature

The seals have been wearing special sensors. The sensors look similar to lumpy metal caps with antennae. The seals are collecting data about oceans to help scientists. A team of climate scientists is being led by oceanographer Lia Siegelman, who studies oceans closely. The team is studying how heat moves through ocean currents.

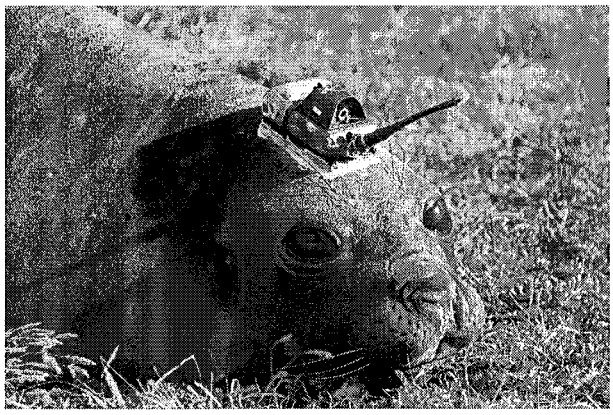
The scientists came up with this clever way of tracking changes in temperature. The seals can swim deep into the icy waters of the Antarctic. The scientists printed their study about the seals in Nature Geosciences in early December.

Scientists depended on the help of one particularly brave female seal. She helped scientists better understand the heat stored at the ocean's depths. Scientists have known that the ocean's currents can move heat downward into the ocean's depths. However, the new findings suggest the reverse is true as well. Heat can sometimes get swirled back up to the surface by deeply moving currents. This can warm the sea's upper layers as well.

This might sound unimportant. However, Siegelman thinks it's important to include this new information into existing climate knowledge.

Findings Show Heat Is Rising To Top Of Sea

Oceans serve as a sink for heat in the Earth's air. This means the cooler the oceans' surfaces are, the more heat they can take in. Now, scientists know heat is rising to the top of the sea. The water might be less equipped to offset rising temperatures than scientists once thought, Siegelman said.



What this means in the long term is unclear. In 2014, Sarah Zielinski reported for Smithsonian.com about how climate change is affecting oceans. It's reshuffling how ocean waters in the Antarctic move. The water in the Antarctic doesn't stay in the Antarctic. These shifts in the water cycle at our planet's South Pole have effects on climate and weather across the globe.

Before the seals' help, scientists had a pretty limited view of the Southern Ocean. They knew little about what went on beneath the surface. Here, temperatures can plunge below 30 degrees Fahrenheit. Thick sheets of sea ice block instruments from collecting data. It is a difficult environment for underwater science studies.

None of that troubles southern elephant seals. They spend nine to 10 months at sea each year. They swim thousands of miles and dive up to half a mile beneath the ocean's surface, usually about 80 times a day. "Even when they sleep, they dive," Siegelman said. "They float down like a leaf."

To make the most of the seals' love of travel, Siegelman and her team of scientists tagged a female elephant seal on the Kerguelen Islands in the ocean. They glued a sensor to her head. Do not be alarmed. The scientists remove the tags on the seals' next visit to land. It's either that or the seals lose the cap when they shed dead skin.

3,000-Mile Journey

In October 2014, the seal started her swim. She wore the high-tech hat atop her head. For the next three months, the scientists followed her 3,000-mile journey. During this journey, she dived 6,333 times.

Siegelman's team also used pictures taken from satellites floating in the sky. They used the images along with the data the seals provided. Together, Siegelman and her team have a clearer

understanding than ever before. It's probably safe to say that the seal didn't recognize the big deal.

Humans do recognize the value, though. Seals are providing knowledge that has been missing, Guy Williams said in 2016. Williams is a polar oceanographer at the University of Tasmania in Australia. He's doing his own temperature studies with seals and walruses.

Williams said the seals have gone to places people have never been able to study.

Quiz

1 According to the section "3,000-Mile Journey," how did scientists use a female seal in their study?

(A) They put a special hat on her that took pictures while she went on dives.

(B) They put a special hat on her that gathered data while she went on dives.

(C) They watched her as she interacted with other seals underwater.

(D) They watched her as she interacted with walruses on land.

2 What is the relationship between heat and ocean currents?

(A) Ocean currents are able to remove heat from all parts of the ocean.

(B) Ocean currents are able to only swirl heat up to the surface of the ocean.

(C) Ocean currents are able to only move heat downward into the ocean's deepest parts.

(D) Ocean currents are able to both move heat down into the ocean and back up to the ocean surface.

3 Read the introduction [paragraphs 1-2].

Which sentence from the section summarizes the effect of climate change?

(A) Elephant seals in funny-looking hats are helping NASA.

(B) NASA is using the seals to study climate science.

(C) Most scientists agree climate change has been caused by humans.

(D) It has resulted in dangers to the Earth, including warmer temperatures and rising seas.

4 Read the section "Findings Show Heat Is Rising To Top Of Sea."

Which selection from the section shows WHY researchers needed the help of seals?

(A) Now, scientists know heat is rising to the top of the sea. The water might be less equipped to offset rising temperatures than scientists once thought, Siegelman said.

(B) The water in the Antarctic doesn't stay in the Antarctic. These shifts in the water cycle at our planet's South Pole have effects on climate and weather across the globe.

(C) Thick sheets of sea ice block instruments from collecting data. It is a difficult environment for underwater science studies.

(D) The scientists remove the tags on the seals' next visit to land. It's either that or the seals lose the cap when they shed dead skin.