

Antarctic warming to reduce animals at base of ecosystem, shift some penguin populations southward

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The warming most global climate models predict will do more harm than simply raise the sea levels that most observers fear. It will make drastic changes in fragile ecosystems throughout the world, especially in the Antarctic.

A warming trend during the last few decades in the Antarctic Peninsula has already forced penguin populations to migrate south and perhaps diminished the abundance of krill that are at the base of the massive food chain at the bottom of the world.

"We're already seeing the marine ecosystems respond dramatically to increases in temperatures along the Antarctic Peninsula," explained Berry Lyons, professor in the School of Earth Sciences and director of the Byrd Polar Research Center at Ohio State University.

Lyons was one of many polar researchers reporting this week on the global climate threat during the annual meeting of the American Association for the Advancement of Science in San Francisco .

"Researchers are seeing the movement of penguin populations southward down the peninsula as sea ice lessens along its margins," Lyons said. "Gentoo and chinstrap penguins are shifting south into areas now populated by adelic penguins, and the adelies are being forced further south, all because of the change in sea ice."

A decrease in sea ice along the coast shows a drop in krill in the marine environment. As a major food source for higher animals, the loss of krill will reduce resources for higher mammals and birds.

Data gained through the Long-Term Ecological Research (LTER) site near the American Palmer

Station suggests that the ecosystem's response to warming in the region includes changes in both the krill's abundance and availability.

"The data implies that there may be less food there as the temperatures rise," he said.

He manages the LTER site in the Dry Valleys near McMurdo Station, the largest of the three American bases in Antarctica . "It you look at the last 100 years or so, things have been warming in the valleys. We have seen lake levels rise, more melt from the surrounding glaciers and more aquatic ecosystems replacing soil-based ecosystems."

Lyons sees what is happening now looking similar to what existed during the Eemian warming period – a time 130,000 years ago before the last major glacial stage. "We know that the climate was warmer then, sea levels were higher by a couple of meters compared to today.

Lyons points to the fact that all the global climate models predict a warming in the Antarctic and a decrease in sea ice along its margins.

"Those two things will have great impacts on both the glacial dynamics of the continent but also on the fragile marine and terrestrial ecosystems that have been thriving there in the past."

Source: Ohio State University

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