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Climate scientists warn agency of threat to polar bears, sea-ice habitat

By Steve Koppes

News Office



Photo by Steven Morello.

A climate scientist at the University and 30 of her colleagues from across North America and Europe are urging the U.S. Fish and Wildlife Service to list the polar bear as a threatened species because global warming is melting its sea-ice habitat.

“As scientists engaged in research on climate change, we are deeply concerned about the effect of Arctic warming on the polar bear habitat,” said a letter submitted to the Fish and Wildlife Service.

“Biologists have determined that sea-ice is critical in the life cycle of the polar bear and the survival of the polar bear as a species. Under the Endangered Species Act, the Fish and Wildlife Service is required to list a species for protection if it is in danger of extinction or threatened by possible extinction in all or a significant portion of its range. The ongoing and projected increased loss of sea-ice in the warming Arctic poses a significant threat to the polar bear.”

The letter was submitted in June, but new evidence of Arctic warming continues to accumulate. In September, NASA released a study of satellite measurements showing that Arctic sea ice that usually survives summer melting shrank by 14 percent between 2004 and 2005.

The letter was not a petition, said Pamela Martin, Assistant Professor in Geophysical Sciences and the College, who organized the effort. “Rather, it was a letter summarizing some key aspects of the best available science on global warming and, in particular, Arctic warming.

“The polar bear listing petition is really illustrative of the challenge in addressing many environmental problems facing us as a global community. These problems don’t fit squarely within a single scientific discipline—they not only require scientists to talk across disciplines, such as the geophysical and biological sciences as in the case of the polar bear, but also across the larger divide that separates scientists from policy-makers.”

In February 2005, the non-profit Center for Biological Diversity, based in Tucson, Ariz., filed a scientific petition with the Fish and Wildlife Service to list the polar bear as a threatened species under the Endangered Species Act. Later, other national environmental groups joined the petition. One year later, the Fish and Wildlife Service announced it would initiate a status review of the polar bear to determine if the species should be proposed for listing. A public comment period followed.

Martin wrote and circulated the letter with the help of four colleagues: Gidon Eshel, Assistant Professor in Geophysical Sciences and the College; David Archer and Douglas MacAyeal, both Professors in Geophysical Sciences and the College; and Raymond Pierrehumbert, the Louis Block Professor in Geophysical Sciences and the College.

The letter states, “the best available observations demonstrate that Arctic warming is rapid, persistent and widespread,”

and that only a reduction of technologically generated greenhouse gases can prevent further Arctic warming and sea-ice melting. The scientists summarized multiple lines of evidence that point to global warming trends, especially in the Arctic:

- An increase in surface temperatures of nearly 1 degree Fahrenheit since the late 19th century
- Warming of the world's oceans over the last 50 years
- Thawing of the northern high-latitude permafrost (ground that was formerly frozen year-round)
- Increased evaporation over the tropics and subtropics
- An increase in the rate of sea-level rise

The Arctic region is especially sensitive to global warming because of the reflectivity of ice and cloud cover, the scientists wrote. Despite slight cooling in some pockets of the Arctic, overall the region has experienced substantial warming. Records show that average annual temperatures are 3.5 to 5 degrees Fahrenheit warmer in Alaska and Siberia. Siberian winters and temperatures in the western Canadian Arctic, meanwhile, are 7 degrees warmer than before, the letter noted.

The scientists also cited the 2001 Third Assessment Report of the Intergovernmental Panel on Climate Change. Pierre Humbert served as lead author of this report, which involved the participation of more than 2,000 scientists from 100 countries. "The IPCC report concluded that the observed global climate changes cannot be accounted for by natural climate forcings alone," said the scientists in their letter.

The planet is committed to a continued trend in global warming for centuries to come, according to the scientists.

"Immediate reductions of greenhouse gas emissions well beyond those that may be considered by some measures 'sustainable' emissions rates are therefore imperative. We urge the Fish and Wildlife Service to acknowledge the threat of Arctic warming on the polar bear."