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Press Release 10-236

Polar Bears: On Thin Ice? Extinction Can Be Averted, Scientists Say

Cutting greenhouse gases now is the key

A female polar bear walks along the shore of Canada's Hudson Bay, waiting for ice to form.
Credit and Larger Version

December 15, 2010

Polar bears were added to the threatened species list nearly three years ago when their icy habitat showed steady, precipitous decline because of a warming climate.

But it appears the Arctic icons aren't necessarily doomed after all, according to results of a study published in this week's issue of the journal *Nature*.

Scientists from several institutions, including the U.S. Geological Survey (USGS), the National Science Foundation (NSF) and the University of Washington, have found that if humans reduce greenhouse gas emissions significantly in the next decade or two, enough Arctic ice is likely to remain intact during late summer and early autumn for polar bears to survive.

"What we projected in 2007 was based solely on the business-as-usual greenhouse gas scenario," said Steven Amstrup, an emeritus researcher at the USGS and senior scientist at the Montana-based organization Polar Bears International. "That was a pretty dire outlook, but it didn't consider the possibility of greenhouse gas mitigation."

Amstrup is the lead author of this week's *Nature* paper. Co-authors are Eric DeWeaver of NSF, David Douglas and George Durner of the USGS Alaska Science Center, Bruce Marcot

Greenhouse gas mitigation can reduce the loss of Arctic sea-ice--and polar bears.
Credit and Larger Version

Arctic sea-ice continues to melt. Year by year, its extent is shrinking.
Credit and Larger Version

Two male polar bears spar near Hudson Bay. The bears need ice there to reach their seal prey.
Credit and Larger Version

Arctic "pancake" ice consists of round pieces ranging from inches to feet in diameter.
Credit and Larger Version

of the U.S. Forest Service in Oregon, Cecilia Bitz of the University of Washington and David Bailey of the National Center for Atmospheric Research in Boulder, Colo.

The 2007 study projected that only about one-third of the world's 22,000 polar bears might be left by mid-century if dramatic Arctic ice decline continued, and that eventually polar bears could disappear completely. The work led to the 2008 listing of polar bears as a threatened species.

"Our current research provides strong evidence that it's not too late to save polar bears from extinction," said DeWeaver, an atmospheric scientist. "We looked for Arctic sea ice tipping points in a climate model in which sea ice is known to be very sensitive to global warming, and we didn't find any."

The challenging issue, he said, is that even without tipping points, sea ice can undergo periods of rapid decline. "But these rapid declines occur due to a combination of natural volatility on a declining trend," says DeWeaver, "rather than a tipping point."

"Ultimately the outcome depends on how much greenhouse gas we add to the atmosphere in the future," he said, "not how much we've added until now."

"Our research offers a very promising, hopeful message, but it's also an incentive for mitigating greenhouse emissions," said Bitz.

Because the scientists specifically looked at whether there's a tipping point beyond which seasonal Arctic ice could not recover, they used a general circulation model in which the sea ice is particularly sensitive to rising temperatures.

Previous work by Bitz and others showed that unchecked temperature increases, along with natural environmental volatility, could result in the loss of vast areas of Arctic ice in less than a decade.

It also showed that with continued business-as-usual greenhouse gas emissions, the ice did not recover and largely disappeared altogether in following decades.

However, the new *Nature* paper indicates that if greenhouse gas emissions were reduced substantially in the near future, rapid ice losses would be followed by substantial retention of the remaining ice through this century--and partial recovery of the ice that disappeared during the rapid ice loss.

Polar bears depend on sea ice for access to ringed and bearded seals, their primary food source. During seasons when they can't reach ice, the bears mostly go without food and can lose about two pounds a day.

The periods when they don't have ice access have increased, and are expected to continue to do so with the current level of greenhouse gas emissions.

As part of this study, the potential sea-ice outlook generated by the general circulation model, as well as several features of polar bear life history, were placed into a larger network model.

The model can, for example, be used to examine the relationship between polar bears and their environment.

The results indicate that increased retention of sea-ice habitat because of greenhouse gas mitigation would allow polar bears to survive in greater numbers throughout this century, and in more areas of the Arctic, than would happen with no mitigation.

Amstrup divided the Arctic into four separate ecoregions according to the nature of ice typically found there.

The 2007 study showed a very high likelihood that polar bears would become extinct in two of those regions given current trends in greenhouse gas emissions.

Last of the polar bears? According to new research, the answer may be no.
Credit and Larger Version

"There's still a fairly high probability in both those regions that polar bears could disappear," Amstrup said.

"But with mitigation and aggressive management of hunting and other direct bear-human interactions, the probability of extinction would now be lower than the probability that polar bear numbers will simply be reduced.

"With mitigation, conditions for polar bears might even improve in the other two ecoregions. The benefit of mitigation to polar bears is substantial."

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