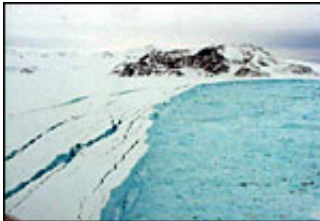


# Arctic sea ice declines again in 2004

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Researchers at the University of Colorado at Boulder have found that the extent of Arctic sea ice, the floating mass of ice that covers the Arctic Ocean, is continuing its rapid decline.

The latest satellite information indicates the September 2004 sea ice extent was 13.4 percent below average, a reduction in area nearly twice the size of Texas, said Mark Serreze of CU-Boulder's National Snow and Ice Data Center, or NSIDC. In 2002, the decline in arctic sea ice during September -- which traditionally marks the end of the summer melt season -- was about 15 percent, a record low, said CU-Boulder researcher Walt Meier of NSIDC.

The decline in sea ice extent during September has averaged about 8 percent over the past decade, said Serreze, who is part of a CU-Boulder team monitoring Arctic sea-ice conditions. "This is the third year in a row with extreme ice losses, pointing to an acceleration of the downward trend," he said.

"While a 'low' September ice extent one year is often followed by a recovery the next year, this was not the case in 2003, which was about 12 percent below average," Serreze said. The September 2004 sea-ice loss was especially evident in extreme northern Alaska and eastern Siberia. The CU-Boulder researchers used remote-sensing data from the SSM/I satellite to record the sea-ice changes.

"We're seeing more melting of multi-year ice in the summer," said Julianne Stroeve, a CU-Boulder

scientist with NSIDC involved in the research. "We may soon reach a threshold beyond which the sea ice can no longer recover." NSIDC is part of CU-Boulder's Cooperative Institute for Research in Environmental Sciences.

One possible explanation for the continuing loss of sea ice is that climate warming from human activities like the burning of fossil fuels is becoming more apparent, said Serreze. "Climate models are in general agreement that one of the strongest signals of greenhouse warming will be a loss of Arctic sea ice," he said. "Some indicate complete disappearance of the summer sea ice cover by 2070."

Serreze believes natural climate variability likely plays some part in the observed changes. "However, the most reasonable view is that the sea ice decline represents a combination of both natural variability and the greenhouse effect, with the latter becoming more evident in coming decades," he said.

One complicating factor is the atmospheric circulation pattern known as the Arctic Oscillation, which may be contributing to the loss of the much thicker "multi-year" ice that has accumulated over many years. "As winds and currents force this ice southward, more of it melts," said Stroeve. "And while new ice is still forming in the winters, it is thinner, and therefore melts faster in the summer than older ice."

In a study funded by the National Science Foundation conducted with assistance from CU-Boulder, former graduate student Shari Fox Gearheard looked at the effects of climate change on Inuit communities in the Arctic region.

"The timing of the climate and environmental changes observed by Inuit in Nunavut vary depending on the phenomenon, but in many cases elders and other experienced Inuit point to the last decade as a period of considerable change," Gearheard said. Nunavut is a Canadian Territory

established in 1999 that is roughly the size of Western Europe.

Gearheard said one of the most frequent observations in indigenous communities all across the circumpolar north is that the weather is more unpredictable than usual.

"In the past, Inuit were able to predict the weather using traditional indicators such as clouds, winds and currents," she said. "These indicators are no longer working."

Inuit elders point out that the sea ice in some places is thinner, causing dangerous travel conditions, she said. The ice forms later and breaks up earlier in the year, and the spring melt season is much shorter than before. In addition, unexpected storms have left hunting parties stranded, and harder packed snow due to recent wind changes makes it more difficult to build igloos for shelter.

The results of Gearheard's work are presented in an interactive multimedia CD titled "When the Weather is Uggianaqtuq: Inuit observations of environmental change." Uggianaqtuq is a North Baffin Inuktitut word meaning to behave unexpectedly or in an unfamiliar way.

Another CU-Boulder project involves the effects of climate change on North Slope communities in Alaska, including the effects of loss of ice cover on the potential for increased damage, erosion and flooding from severe storms.

CU-Boulder researchers Jim Maslanik of NSIDC said the retreat of the protective ice edge further offshore later into autumn has increased the potential for flooding and erosion for coastal communities such as Barrow.

"Another aspect of the changing ice conditions is that, in addition to the ice edge retreating far offshore, the rate of retreat of the ice edge has been very rapid," said Maslanik. "In recent years, this has resulted in unexpected impacts, such as unusually large numbers of polar bears being stranded on shore near Barrow."

Source: University of Colorado at Boulder

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