

## Arctic melt 20 years ahead of climate models

\* 13:59 19 December 2008 by Devin Powell

\* For similar stories, visit the [Climate Change Topic Guide](#)



Though scientists tend to agree that summer ice at the North Pole will eventually disappear, they haven't settled on a date. And one group now claims to have evidence that Santa may have to start swimming much sooner than we thought.

US researchers claim to have found evidence that accelerated melting has crossed a "tipping point" from which there is no going back.

The amount of summer ice at the North Pole has steadily declined since 1979, according to satellite images. Computer models predict that this trend will continue, leaving the Arctic completely ice-free during the summers as early as 2030.

In 2007, though, the ice surprised everyone by contracting far more rapidly than the models predicted. A particularly warm summer left only 4.28 million square kilometres by September - a record 23% below the previous minimum.  
Accelerated ice loss

At the time, researchers including Mark Serreze of National Snow and Ice Data Center in Boulder, Colorado claimed that the Arctic had reached a "tipping point" - a dramatic and irreversible slide towards ice-free conditions.

As the summer melting season finished up this year, they waited with bated breath to see how much, if any, ice would survive.

4.67 million square kilometres remained at the end of September. A positive interpretation says that the Arctic defied the apocalyptic prophecies by recovering slightly, thanks to a pattern of colder and windier weather.

But Serreze is sticking to the idea that we have reached a point of no return.

"If you look over the past five years, you see an acceleration of ice loss," says Serreze. Though 2008 did not beat the record set by 2007, it is still the second-lowest amount on record, below the record lows of 2002 and 2005.

He and his colleagues, speaking at the American Geophysical Union meeting in San Francisco this week, presented new evidence for a mechanism driving this acceleration.

Dramatic changes

During the summer, as ice melts, it is replaced by dark ocean waters that absorb heat. When the cooler winter weather arrives, the oceans release this warmth, creating a pocket of higher temperatures above the Arctic that slows down the regrowth of sea ice during the winter.

By measuring the air temperature directly over the Arctic after the end of the summer melt, Serreze found a large amount of released heat. Temperatures in areas losing ice were as much as 5 °C higher over the last four years as compared to the historic average.

The computer models predict this "Arctic acceleration," says Serreze but 20 years into the future. "The models are giving us the big picture of what is going on, but it's all happening much faster than expected," he says.

This change may already be irreversible, as the extra heat creates a runaway thinning of ice that will soon be unable to survive in the summer Sun. If it disappears entirely during the summers, the ramifications would be global.

"The Arctic is the heat sink of the Northern hemisphere; the circulation patterns of the oceans could change dramatically," says Serreze.

What's more, the effects from this rush of heat seem to already be bleeding out into neighbouring Alaska and Siberia.

Balmy spell?

Katey Walter of the University of Alaska, Fairbanks, presented data at the AGU suggesting that lakes and permafrost are thawing in these regions. These changes release methane - a greenhouse gas with 21 times the warming power of carbon dioxide.

Cecelia Bitz of the University of Washington in Seattle, who helped to create one of the more widely accepted climate models, agrees that an ice-free Arctic ocean is inevitable at this point.

She suspects, though, that the rapid sea-ice loss of recent years may simply be a fluke of the weather that will soon return to the longer trend. "I can't predict the short-term weather, but I do have a good idea about the long-term climate," says Bitz.

Her latest simulations, also presented at the AGU meeting, offer a message of

tentative hope for recovery. At constant greenhouse gas emissions fixed to projected 2020 levels, sea ice retreats slowly, not precipitously. And when greenhouse gases are removed entirely from the model, sea ice regrows, even in future scenarios in which global warming has stripped the Arctic of ice year-round.

"A tipping point suggests falling of a cliff, with no way to climb back up - I can't see the evidence for this," says Bitz.