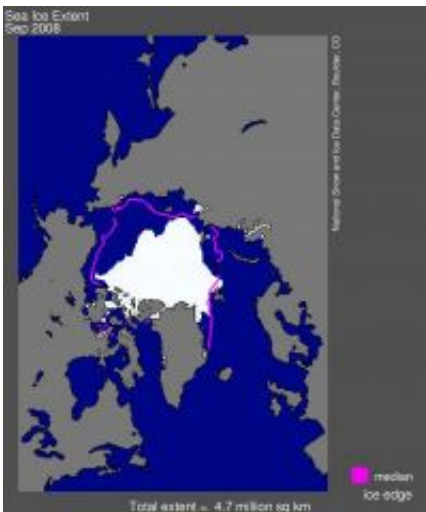


Arctic sea ice hits second-lowest extent, likely lowest volume

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Arctic sea ice extent for September 2008 was 1.8 million square miles, second lowest on satellite record. University of Colorado at Boulder researchers believe it may be the lowest sea ice volume ever recorded. The light blue line in the Arctic shows the normal ice edge. Image: University of Colorado at Boulder's National Snow and Ice Data Center

Arctic sea ice extent during the 2008 melt season dropped to the second-lowest level since satellite measurements began in 1979, reaching the lowest point in its annual cycle of melt and growth on Sept. 14, according to researchers at the University of Colorado at Boulder's National Snow and Ice Data Center.

Preliminary data also indicate 2008 may represent the lowest volume of

Arctic sea ice on record, according to the researchers. The declining Arctic sea ice is due to rising concentrations of greenhouse gases that have elevated temperatures across the Arctic and strong natural variability in Arctic sea ice, according to scientists.

Average sea ice extent during September, a benchmark measurement in the scientific study of Arctic sea ice, was 1.8 million square miles. The record monthly low, set in 2007, was 1.65 million square miles. The third lowest monthly low was 2.15 square miles in 2005, according to researchers at the center.

The 2008 low strongly reinforces the 30-year downward trend in Arctic sea ice extent, said CU-Boulder Research Professor Mark Serreze, an NSIDC senior scientist. The 2008 September low was 34 percent below the long-term average from 1979 to 2000 and only 9 percent greater than the 2007 record. Because the 2008 low was so far below the September average, the negative trend in the September extent has been pulled downward, from a minus 10.7 percent per decade to a minus 11.7 percent per decade, he said.

"When you look at the sharp decline we have seen over the past 30 years, a recovery from lowest to second lowest is no recovery at all," Serreze said. "Both within and beyond the Arctic, the implications of the decline are enormous."

Conditions in the spring, at the end of the growth season, played an important role in the outcome of this year's melt, the researchers said. In March 2008, thin first-year ice covered a record high 73 percent of the Arctic basin. While it may appear to be a recovery of the sea ice, the large extent masked an important aspect of sea ice health since thin ice is more prone to melting during the summer. The widespread thin ice in spring 2008 set the stage for extensive ice loss during the melt season, according to the NSIDC researchers.

Through the 2008 melt season, a race developed between the melting of thin ice and gradually waning sunlight, said CU-Boulder Research Associate Walt Meier, a research scientist at NSIDC. Summer ice losses allowed significant solar energy to enter the ocean and heat up the water, melting even more ice from the bottom and sides. Warm oceans store heat longer than the atmosphere does, contributing to melt long after the sunlight has begun to wane, Meier said. In August 2008, the Arctic Ocean lost more ice than any previous August on record.

"Warm ocean waters helped contribute to ice losses this year, pushing the already thin ice pack over the edge," said Meier. "In fact, preliminary data indicate that 2008 probably represents the lowest volume of Arctic sea ice on record, partly because less multiyear ice is surviving now and the remaining ice is so thin."

In 2008, summer conditions worked together to save some first-year ice from melting and to "cushion" the thin ice pack from the effects of sunlight and warm ocean waters, preventing the "perfect storm" for ice loss seen in 2007, according to the researchers. Temperatures in 2008 were cooler than in 2007, although still warmer than average.

Cloudier skies also protected the ice from some melt, and wind patterns spread the ice pack out, leading to higher extent numbers, according to CU-Boulder Research Associate Julianne Stroeve, an NSIDC research scientist. The end result was the natural variability of short-term weather patterns provided enough of a "brake" to prevent a new record-low ice extent from occurring, she said.

"I find it incredible that we came so close to beating the 2007 record, without the especially warm and clear conditions we saw last summer," said Stroeve. "I hate to think what 2008 might have looked like if the weather patterns had set up in a more extreme way."

The melt season of 2008 reinforces the decline of Arctic sea ice documented over the past 30 years, said CU-Boulder Senior Research Associate Ted Scambos, NSIDC lead scientist. "The trend of decline in the Arctic continues, despite this year's slightly greater extent of sea ice," said Scambos. "The Arctic is more vulnerable than ever."

Source: University of Colorado at Boulder

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