



## Study: Arctic sea ice will shrink dramatically

Maximum area within 30 years expected to be third of last year's low level

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WASHINGTON - The areas of the Arctic covered in sea ice in summers will shrink by two-thirds within 30 years, researchers report, attributing the shrinkage to natural conditions as well as manmade greenhouse gases.

They expect the area covered by summer sea ice to decline from about 2.8 million square miles normally to 620,000 square miles — "a loss approximately four-fifths the size of the continental U.S.," the National Oceanic and Atmospheric Administration said in a statement. NOAA co-sponsored the study.

Last year's summer minimum was 1.8 million square miles in September, second lowest only to 2007 which had a minimum of 1.65 million square miles, according to the National Snow and Ice Data Center.

The center has also said that Arctic sea ice reached its winter maximum for this year at 5.8 million square miles on Feb. 28. That was 278,000 square miles below the 1979-2000 average making it the fifth lowest on record. The six lowest maximums since 1979 have all occurred in the last six years.

### 'Changing faster'

The new analysis, using complex computer models of weather and climate, says conditions that had been forecast by the end of the century could occur much sooner.

"The Arctic is changing faster than anticipated," said study co-author James Overland, an oceanographer at NOAA's Pacific Marine Environmental Laboratory. "It's a combination of natural variability, along with warmer air and sea conditions caused by increased greenhouse gases."

A change in the amount of ice is important because the white surface reflects sunlight back into space. When ice is replaced by dark ocean water that sunlight can be absorbed, warming the water and increasing the warming of the planet.

"Due to the recent loss of sea ice, the 2005-2008 autumn central Arctic surface air temperatures were greater than 5 degrees Celsius (9 degrees Fahrenheit) above" what would be expected, the researchers reported.

That amount of temperature increase had been previously expected by the year 2070.

### Refrigerator effect explained

"The Arctic is often called the Earth's refrigerator because the sea ice helps cool the planet by reflecting the sun's radiation back into space," co-author by Muyin Wang of the University of Washington explained in a statement. "With less ice, the sun's warmth is instead absorbed by the open water, contributing to warmer temperatures in the water and the air."

The study appears in Friday's edition of the journal *Geophysical Research Letters*.

Overland and Wang combined sea-ice observations with six complex computer models used by the Intergovernmental Panel on Climate Change to reach their conclusions. Combining several computer models helps avoid uncertainties caused by natural variability.

Much of the remaining sea ice would be north of Canada and Greenland, with much less between Alaska and Russia in the Pacific Arctic.

The study was supported by NOAA's Climate Change Program Office, the University of Washington's Institute for the Study of the Ocean and Atmosphere, and the U.S. Department of Energy.

*The Associated Press contributed to this report.*

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