

## Arctic Sea Ice Extent Hits Record Low

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Arctic sea ice fell below all previous records for the lowest absolute minimum extent ever measured by satellite on Thursday and Friday, said scientists at the National Snow and Ice Data Center. Sea ice extent has fallen below the 2005 record low absolute minimum and is still melting, said researcher Walt Meier.

A rapid disintegration of Arctic sea ice during July has prompted scientists to warn there is a 92 percent chance that Arctic sea ice extent will hit an annual record low. Sea ice extent, the area of an ocean covered by at least 15 percent of ice, has been shrinking since the late 1970s, when satellite measurements began. The decline is believed by many researchers to be due to higher temperatures due to global warming from a buildup of greenhouse gas emissions in the Earth's atmosphere. In April, scientists at the University of Colorado-Boulder forecast a 33 percent chance that the September minimum of sea ice would set a new annual low record, but after observing what happened to the ice in July, they drastically revised that prediction.

Satellite images of the coast of eastern Siberia and the New Siberian Islands, 1,200 miles northwest of Alaska, show sea ice retreat over 42 days this summer. (Images courtesy NASA) "During the first week in July, the Arctic sea ice started to disappear at rates we had never seen before," said Sheldon Drobot, who leads the Arctic Regional Ice Forecasting System group at the Colorado Center for Astrodynamic Research, CCAR.

The group at the University of Colorado-Boulder's aerospace engineering sciences department is the only group in the world making seasonal Arctic sea ice forecasts based on probability. Arctic sea ice researchers pay particular attention to the months of September and March because they generally mark the annual minimum and maximum sea ice extents respectively, said Drobot. The record low September minimum for sea ice, set in 2005, is 2.15 million square miles, Drobot said.

For 2007, the most likely minimum extent is 1.96 million square miles, he said. But there is a 25 percent chance the September sea ice extent will shrink even more - to 1.88 million square miles - said Drobot, and even a five percent chance it will fall to 1.75 million square miles, he said. Arctic sea ice is "one of the better predictors of climate change on Earth," Drobot said. "There will probably be about two-thirds as much sea this September as there was 25 years ago, a good indication that something significant is happening with the climate."

The factors triggering the unusually strong July sea-ice decline appear to be a combination of less multi-year ice and more cloud-free days, which accelerated the melting effects of

solar radiation on the ice, Drobot said. “Things can really change fast, which is why we continually update our forecasts,” he said. The sea ice research by the CCAR group is funded by the National Science Foundation and NASA. “We have been seeing a sharp decline in thicker, multi-year ice that has survived more than one melt season,” said CCAR scientist James Maslanik. “This has been replaced in many areas by a thin, first-year layer of ice as well as by younger, thinner types of multi-year ice. The thinner ice just does not have the mass to withstand the effects of warming climate,” Maslanik explained. The CCAR researchers used satellite data from the U.S. Department of Defense and temperature records from the National Oceanic and Atmospheric Administration for the forecasts, which they have been producing for five years.

Melting sea ice, Blackhead, Newfoundland, Canada. June 2007 (Photo by Diana Cardoso)  
Currently, sea ice extent is particularly low in the East Siberian side of the Arctic and the Beaufort Sea north of Alaska. Ice in the Canadian Archipelago is also quite low, the scientists said. Along the Atlantic side of the Arctic Ocean, sea ice extent is not as strikingly low, but is still less than normal.

Over the past few years, the Arctic sea ice decline has been sharpest in the western Arctic, said Drobot. Such regional variation is of interest to the maritime industry, including government agencies, international shipping companies, energy exploration corporations and tourism cruise lines active in the far North, he said. “This type of information is useful for ship operators trying to plan activities several months out,” Drobot said. “It’s also useful for short-term operational planning, including cruise ship excursions.”

Assuming the sea ice decline continues in the Arctic, there probably will be intercontinental “Northwest Passage” type of transit from North America to places like Europe in the coming decades, Drobot projected. A seasonal or year-round, ice-free channel through Arctic waters would be shorter and cost less than shipping through the Panama Canal.

*Find more information on CU-Boulder’s Arctic Regional Ice Forecasting System group at: <http://ccar.colorado.edu/arifs> . View a website with continuous updates on Arctic sea ice conditions maintained by researchers at CU-Boulder’s National Snow and Ice Data Center.*

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