

Arctic ice melt could pause, then resume, study finds

Lauren Morello, Environment & Energy Publishing, 8-12-11

The ongoing retreat of Arctic sea ice could halt or even reverse for brief periods over the next few decades, according to a new study.

But scientists at the National Center for Atmospheric Research say that without steep reductions in man-made greenhouse gas emissions, Arctic warming will eventually produce sea ice-free summers. Their work was published yesterday in the journal *Geophysical Research Letters*.

The reason predicting ice behavior over the short term is tricky, the scientists conclude, is that natural climate variations still exert a significant influence on the Arctic's annual summer ice melt.

In some years, the variations can exacerbate the warming trend driven by greenhouse gas emissions. In other years, they can counteract it, said the study's lead author, NCAR scientist Jennifer Kay.

"For observed sea-ice trends from 1979 to the present, our results suggest approximately half of the trend is a result of increases in greenhouse gases," she said. "The other half is the result of natural variations in the system."

Julienne Stroeve, a scientist with the National Snow and Ice Data Center, said Kay's results echoed the current understanding of scientists who study sea ice.

"We know there is lots of natural variability in sea ice trends as well as a forced [man-made] component," she said.

Still, Kay said she and her co-authors, NCAR researchers Marika Holland and Alexandra Jahn, were surprised when their climate model simulations showed that, in the late 20th century, 20-year periods of increasing sea ice were equally as likely to occur as 20-year periods of decreasing sea ice.

The same model projects that in the early part of this century, the Arctic could experience shorter decadelong periods when sea ice retreat halts or reverses.

"These fluctuations are temporary, and they don't really negate the long-term picture," Kay said. "Sea ice will continue to disappear if we continue to increase greenhouse gas concentrations in the atmosphere."

A third of Arctic's ice cover gone since 1979

The Arctic's sea ice cover has declined about a third since 1979, when satellites began tracking the extent of polar ice. That trend has intensified in recent years. In 2007, Arctic summer sea ice extent hit a record low, dipping 40 percent below its 30-year average.

In a previous study, published in *Geophysical Research Letters* in 2008, Kay suggested that an unusually sunny summer exacerbated warming driven by greenhouse gas emissions to produce that record-setting summer -- making 2007's historic sea ice melt a prime example of the theory outlined in the new study.

The research comes as scientists are watching the Arctic's sea ice closely for signs it has hit its annual summer low, which normally occurs in mid-August.

Last month, the average Arctic sea ice extent dropped to 3.06 million square miles, the lowest level recorded in any July since satellite observations began in 1979.

The previous record low for July was set in 2007, when average ice extent fell to 2.98 million square miles.

But that doesn't mean this year will bring a new yearly minimum for the Arctic's sea ice, said Stroeve, who was busy examining the latest data yesterday.

"Looking at what's going on in the Arctic even today, it's close to the 2007 record low," she said. "There was a slowdown [in melting] at the end of July, but then it's sped up again. We're neck and neck with 2007."