



Arctic sea ice in 2016: A preview of the future

Julienne Stroeve (1), Mark Serreze (1), Ingrid Ornaheim (2), Marika Holland (3), Stephen Vavrus (4), Walt Meier (5), Ted Scambos (1), and Florence Fetterer (1)

(1) University of Colorado, National Snow and Ice Data Center, Boulder, United States (stroeve@nsidc.org), (2) Geophysical Institute, University of Bergen and Bjerknes Centre for Climate Research, Bergen, Norway, (3) National Center for Atmospheric Research, Boulder, CO USA, (4) University of Wisconsin, Madison, WI, USA, (5) NASA Goddard Space Flight Center Cryospheric Sciences Lab, Code 615 Greenbelt, MD, USA

The Arctic is warming twice as fast as the global average, resulting in dramatic thinning and shrinkage of the Arctic sea ice cover. In recent years the ice loss has accelerated and the 10 lowest summer sea ice extents have all occurred within the last 10 years, leading to the real possibility that the Arctic Ocean will become ice-free during summer by about mid-century. This ice loss has profound consequences for ecosystems in the Arctic and economic activities. The prospect of longer open water periods has led to an urgent need to predict sea ice conditions at the pan-Arctic and regional scales. However, as the Arctic Ocean heads towards seasonally ice-free conditions, a period of large variability is expected, making it more difficult to forecast ice conditions.

This year saw the largest departures yet from the long-term mean, with each month falling more than 2 standard deviations below the long-term mean, and several months more than 3. This was unprecedented and resulted in 2016 having the lowest annual sea ice extent recorded during the satellite and historical sea ice data record. These large departures from climatology coincide with increased variability in late summer and autumn ice conditions observed since 2007. Together with climate model simulations from the CESM Large Ensemble (LE) we evaluate whether or not the observed increase in variance foreshadows a shift to seasonal ice-free conditions.