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ABSTRACT

Comparisons of Arctic sea ice extent, area and temperature analyses for 2002-2015

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On February 15th, Arctic sea ice reached its maximum extent 14.34 million square kilometer, occurred more than 10 days early than the average date, and the maximum ice extent was the lowest in the satellite record ever since 1979. The Arctic sea ice has been declining rapidly according to the satellite observation . And in the summer of 2012 the Arctic minimum sea ice extent unprecedentedly fell to 3.5 million square kilometer which raising concern that the Arctic may be on the verge of a fundamental transition toward a seasonal sea ice cover. To more general calculate the Arctic sea ice change trends, dividing the whole Arctic into 12 regions according the sea area (Beaufort Sea, Chukchi Sea, East Siberian Sea, Laptev Sea, Kara Sea, Barents Sea, Greenland Sea, Baffin Bay/Gulf of St. Lawrence, Canadian Archipelago, Hudson Bay, Central Arctic, Bering Sea), then respectively analyzing the 12 region's daily, monthly, seasonally sea ice extent and area that derived from the ASI algorithm daily sea ice concentration data provided by the University of Bremen to estimate Arctic sea ice variability from June 2002 to May 2015. In order to find out the main temperature factor influences Arctic sea ice melting and confirm the Arctic sea ice sensitive to global climate change. This paper comparing and analyzing the correlation of sea ice extent and area change with sea surface temperature and air temperature using the cumulative temperature of NCEP Real-time global sea surface temperature data (RTG_SST) and NCEP-DOE Reanalysis 2-m air temperature data.