Geophysical Research Abstracts
Vol. 14, EGU2012-3704, 2012
EGU General Assembly 2012

Arctic sea ice loss: a tale of two seasons

L. H. Smedsrud
Bjerknes Centre for Climate Research, Bergen, Norway (larsh@gfi.uib.no)

The retreat of Arctic Sea ice over the last decades has very different patterns for winter and summer. The summer retreat occurred mostly in the Siberian sector, is connected to an overall thinning that has been ongoing since the 1960's, and has been accelerated by increased export in the Fram Strait since 2003. The summer retreat will shortly be summarized and discussed based on model results and satellite observations.

The retreat of sea ice cover in the winter is caused by very different processes. This fundamental difference is caused by the very efficient re-growth of sea ice in open water during winter when there is no solar radiation, masking changes in ice covered area during winter in the Siberian sector. The winter retreat has mostly occurred in the Barents Sea, and the annual (July-June) mean sea ice cover reduced by 50 % here during the last decade (1998-2008).

A regional ice–ocean model is used to assess and quantify the cause of the Barents Sea ice loss. The role of surface fluxes, Atlantic heat transport, and sea ice import from the Arctic Ocean is discussed. The long-term decrease in Barents Sea ice area reflects the increased Atlantic inflow, while import of ice plays a role in the year-to-year variability. The seasonal sea ice cover and the large Atlantic heat transport makes the Barents Sea dominate the entire Arctic Ocean heat budget. Most of the Arctic winter sea ice retreat is thus not ice that has melted; this sea ice never froze.