

Regional sea ice outlook for Greenland Sea and Barents Sea - based on data until the end of July 2011

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The monthly mean sea ice extents for July 2011 based on Norwegian ice charts produced primarily from passive microwave satellite data, supplemented with high resolution SAR imagery since 2007, are compared with the corresponding monthly means for July for the years 2008-10 (Fig. 1), and with 30, 20, and 10 year averages for monthly means for the periods 79-08, 80-99 and 99-08 (Fig. 2).

July 2011 ice extent

In the southern Greenland Sea and Fram Strait, the July 2011 mean ice extent is slightly larger than the corresponding ice extent for the past three years (Fig. 1). Further north, in the Fram Strait, ice extent is similar to July 2010, but less than July 2008 and 2009. This also means that the northern coast of Spitsbergen (the largest island of Svalbard) appears ice free.

For the Barents Sea, as in the earlier months of this year's Arctic Sea Ice Outlook, ice extent varies stronger between individual years also in July. The map (Fig. 1) shows ice in Storfjorden which this year, in breaking out was able to transit around the southern tip of Svalbard (Sørkapp) and travel up the west coast. This was the first time since 1998 that a large expanse of ice has done this, and during the last week of July caused coal transport ship traffic into Bellsund to be suspended and prevented cruise ships entering Isfjorden. However this was a short-lived event, and by the beginning of August the ice had virtually all dissipated. East of Edgeøya the ice edge is situated more or less in the middle of the last years' July ice edges, whereas further east towards Franz Josef Land, the ice edge can be found further north than in the last three years. This is a continuation of the development we have seen from the June data with relatively little sea ice in the eastern Barents Sea.

Comparison with long-term means over decades (Fig. 2) shows as well a relatively similar picture to what we have seen from the June data. Long-term means in the Greenland Sea and Fram Strait appear quite stable. July 2010 ice extent is slightly larger than the last decadal mean for the southern Greenland Sea, and similar to the mean in the Fram Strait. For large areas in the Barents Sea, the July 2011 data show an ice edge located further north than the different decadal means plotted in Figure 2. Accordingly, the strait between Svalbard and Franz Josef Land can be seen to be partly ice-free.

Forecast

The Norwegian Ice Service ice charts provide a record for the Svalbard area that extends back to 1967 (45 years). The ice charts use six categories for ice concentration: open water (0-10%), very open drift ice (10-40%), open drift ice (40-70%), close drift ice (70-90%), very close drift ice (90-100%), and fast ice (100%). Monthly average area values for each of these classes were calculated within a box extending from 72 to 85°N and 0 to 40°E. The sum of these values was then used as the average monthly ice area for our analysis.

The forecast uses a simple statistical regression, using:

- ice extent from the ice charts,
- NOAA Extended Reconstructed Sea Surface Temperature (SST) V3b (<http://www.esrl.noaa.gov/psd/data/gridded/data.noaa.ersst.html>), and
- NWS Climate Prediction Centre (CPC) Arctic Oscillation Index (http://www.cpc.ncep.noaa.gov/products/precip/CWlink/daily_ao_index/ao.shtml).

Monthly data to the end of July was used. For September ice extent, we find:

$$\begin{aligned} IceSeptember = & 208105.5 + (-31459.58 * AOMarch) \\ & + (0.42146 * IceJuly) \\ & + (7827.91 * SSTJune) \end{aligned}$$

Taking the values of 1.424, 267,984, and 3.69 for *AOMarch*, *IceJuly*, and *SSTJune* respectively, we obtain a predicted ice extent of 216,112 km². This is almost the same as our prediction from July, and if correct would be less than the September average, and lower than the previous four Septembers (2007-10).

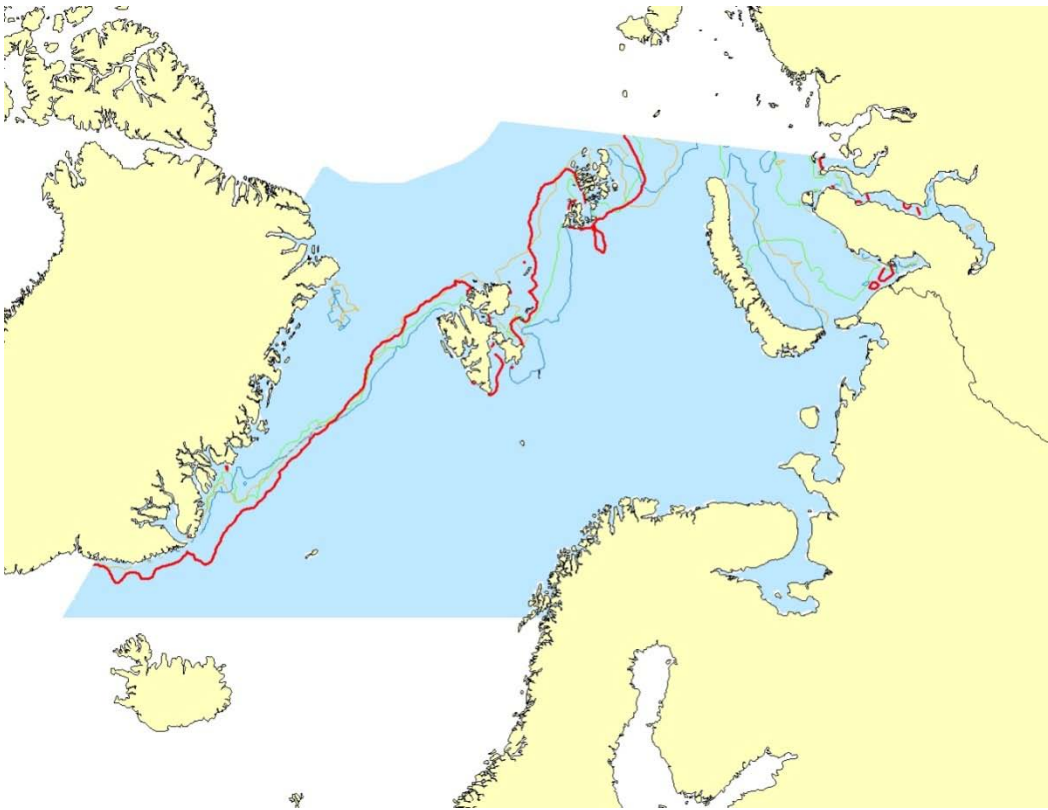


Fig. 1: Ice extent (monthly means, July) southern border of 30% ice concentration, in the Greenland Sea / Fram Strait and Barents Sea, based on passive microwave satellite data (red = July 2011, orange = July 2010, green = July 2009, blue = July 2008).

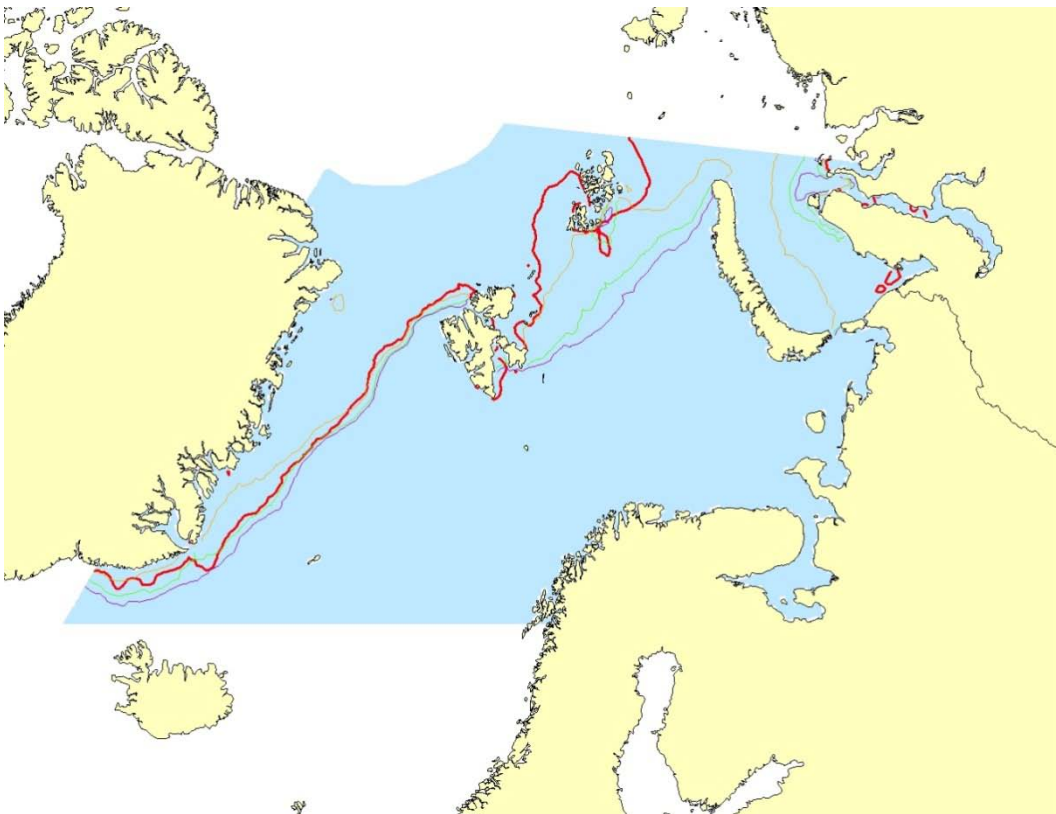


Fig. 2: Ice extent (monthly means, July) southern border of 30% ice concentration, in the Greenland Sea / Fram Strait and Barents Sea, based on passive microwave satellite data (red = July 2011, orange = mean July 1999-2008, purple = mean July 1980-1999, green = mean July 1979-2008).