

2010 Sea Ice Outlook Projections as of 14 July 2010

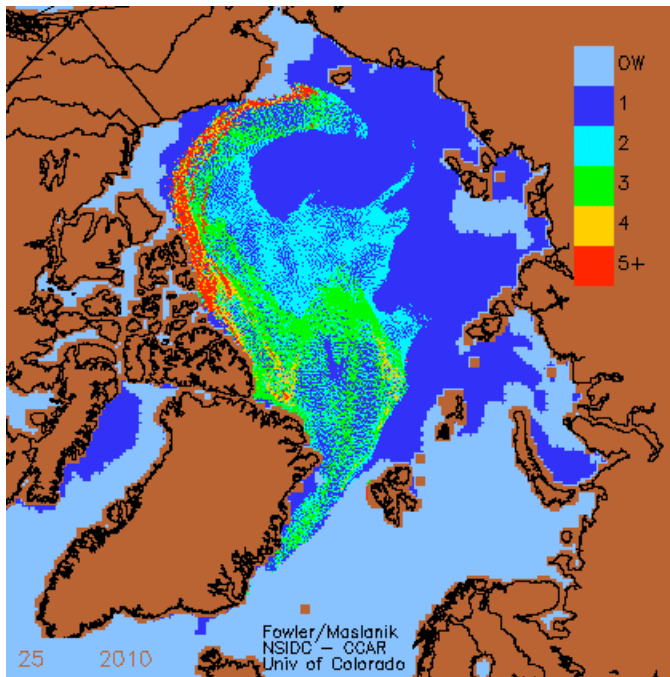
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1. Extent Projection

Our overall projection for minimum ice extent remains unchanged from last month. That estimate is that the end-of-summer ice extent will be $4.5 \times 10^6 \text{ km}^2$, with the possibility of $3.8 \times 10^6 \text{ km}^2$ depending on atmospheric circulation.

2. Methods/Techniques

The following is based on subjective analyses based on various data sets and historical patterns. This includes assessment of U. of Colorado satellite-derived (Lagrangian drift) sea ice age and ice drift in the context of conditions in previous years, along with review of atmospheric fields and a variety of other data sets.



3. Rationale

Our projection is based on the following rationale:

Comparing our latest ice age data (for 21 June 2010; left) to current (14 July) ice extent data shows that the pack edge has retreated back to the multiyear ice edge in the eastern Arctic and in the Beaufort and Chukchi seas. (It is important to emphasize that since we use a 40% concentration cutoff, this means

that ice still could be present in areas where we show “open water” in these maps.) Further retreat may therefore be delayed in those areas, which might account for the decrease in the previously rapid rate of ice loss seen in the total ice extent plot on NSIDC’s Sea Ice Index page. Ice remains extensive in the East Siberian and Laptev seas, consistent with wind patterns that have favored westward and southward drift into those areas during June. Over the first part of July however, low pressure has become more dominant in the central Arctic, which could set up northward drift along with warm air transport in those areas. This pattern would be consistent with mean pressure fields for July-September. The result could be a rapid retreat of the first-year ice cover in the Siberian seas and Canada Basin and

accelerated decrease in total extent. We still anticipate some retreat of the second-year (light blue) ice in the central Arctic and persistence of the older ice into late summer.

Beaufort and Chukchi seas:

As noted in the pan-Arctic outlook discussion, the 40% concentration ice edge has retreated to the edge of the band of the several-year-old multiyear ice in the Beaufort and Chukchi seas. Since our data show this multiyear ice as being close to shore near Barrow, it is likely that ice will persist in that area relatively late into the melt season. Some offshore, northward drift of this strip of ice is likely, particularly in the Chukchi Sea if typical summer circulation patterns occur.

We anticipate that the ice further north, beyond the oldest ice (yellow and red) will melt out first, perhaps leaving a narrow strip of multiyear ice but with a semi-enclosed "polynya" opening up in the western Canada Basin.

East Siberian and Laptev seas:

As noted above, we think it likely that the first-year ice persisting in these areas will melt or retreat rapidly through the rest of July and August.

4. Executive Summary

We anticipate that the end-of-summer ice extent will be $4.5 \times 10^6 \text{ km}^2$. A larger decrease to $3.8 \times 10^6 \text{ km}^2$ is possible depending on atmospheric circulation patterns. Ice extent is likely to retreat rapidly in the East Siberian and Laptev seas, with thick multiyear ice persisting in the southern Beaufort Sea and eastern Chukchi Sea. Overall, we expect the loss of ice extent to accelerate, following the slow-down seen over the last few weeks.