

Contribution to summary evaluation of Regional Sea Ice Outlook

Coastal sea-ice break-up at Barrow

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The June contribution to the regional outlook by our team anticipated sluggish melt onset with lighter ice conditions in the later season due to the lack of multiyear ice. Mostly, this assessment proved to be correct and details can be found in the monthly outlook contributions.

Of particular interest was the exploratory forecast of coastal ice break-up at Barrow which proved to be interesting, both as a tool to chart the progress of the melt season, and in its comparative success in predicting sluggish melt over a period of 1-2 weeks out. The progression of seasonal melt is summarized in Figure 1, which indicates that 2009 had the latest break-up on record over the past 10 years and that this was largely driven by above normal cloudiness, tying in with large-scale observations for the Arctic Ocean region as a whole.

Factors driving the 2009 minimum

Barrow break-up was characterized by moderately heavy ridging leading to landfast ice breaking out south of Barrow before break-up occurred offshore Barrow. Disintegration of on-shore landfast ice happened late in the season due to generally overcast skies in June and July.

Additional data or data products that would be useful for improving outlooks in the future, including any critical gaps in field observations

An improved characterization of grounded pressure ridges in spring, i.e. prior to the onset of melt, would enable the detection of very early break-up. General forecasts of cloudiness one month ahead (e.g. weekly mean downward shortwave flux) would be sufficient for a long-term prediction of near-shore melt.

Implications, based on this year's results, for the future state of arctic sea ice

Break-up of landfast ice at Barrow continues to be at the mercy of the agitation of sea ice in the Chukchi Sea in winter and cloudiness in June and July.

Other "lessons learned"

The Outlook helped focus different forecasting efforts and analysis of a decade's worth of data from the Barrow Sea Ice Observatory, potentially also providing guidance for larger-scale regional forecasting efforts.

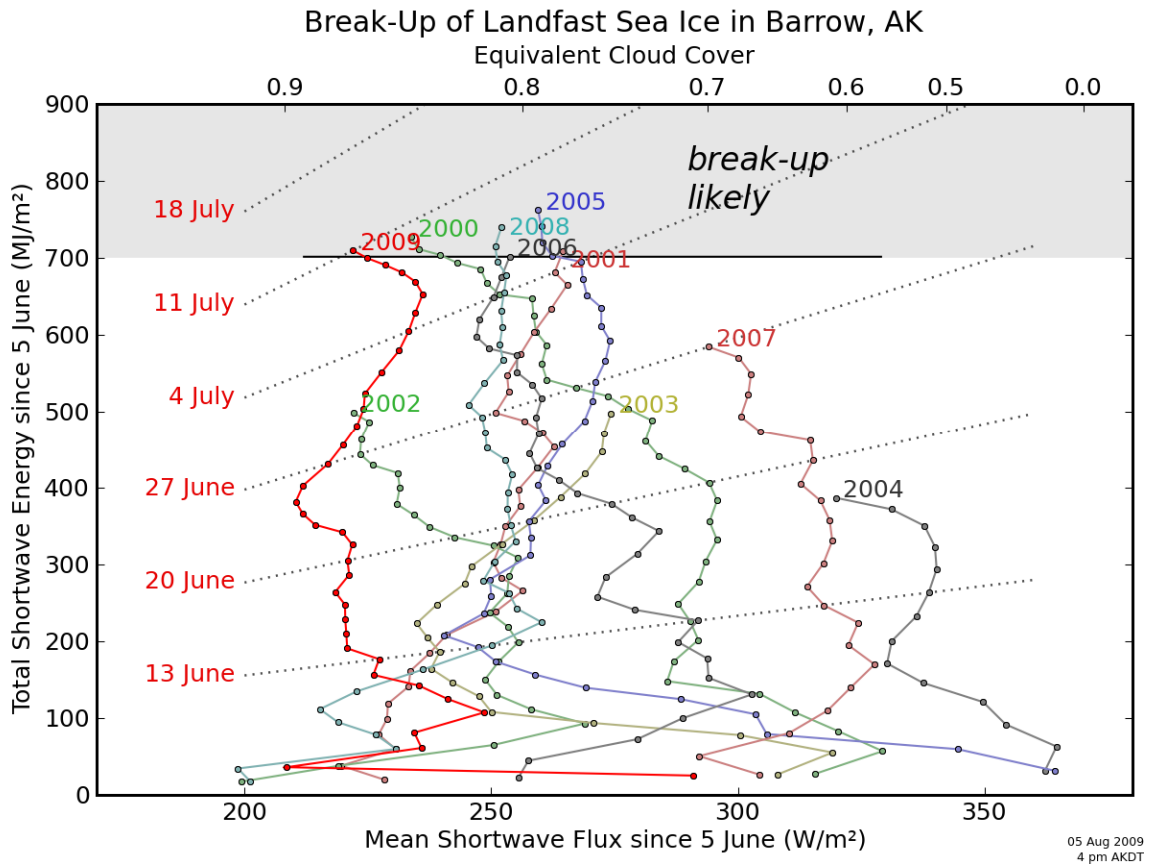


Fig. 1: Break-up timing and solar shortwave energy incident at the surface (mean and cumulative shown on bottom and left axis, respectively) for 2009 (thick red line) and other recent years. Curves terminate at observed break-up. The shortwave flux is used as an indicator for radiative forcings. The grey area at the top corresponds to the seasonal stage at which ice break-up is imminent and determined by local sealevel and winds. Details at www.gi.alaska.edu/snowice/sea-lake-ice/Brw09/forecast/.