

Outlook for 2010 September Arctic Sea Ice Extent Minimum, August Update

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As in the June 1 Outlook, we used the most recent data available to produce a full forecast for the remainder of the summer. In this case we use week 31 data, 6 weeks later than the previous update. As in previous forecasts, we use NASA Team sea ice concentration, NCEP 2-meter air temperature, and NCEP Sea Level Pressure as predictors, and ice extent/concentration as the predictand. The statistical model used is the Arctic Regional Ice Forecast System, developed at the University of Colorado and being implemented operationally at the National Ice Center.

We again see a negative bias in the forecast values versus actual, reflecting the lack of predictive capability in the Canadian Archipelago, but note that the 2-week forecast (week 29) is much higher than in previous reports, and the final values, while lower than the initial (week 17) forecast, are higher than the week 25 update. Without a quantitative measure for the low bias, we can say that 4.548 million km² represents a lower bound on the predicted ice extent using this model, and the actual value may be somewhat higher. Thus while we will see another anomalously low year for sea ice extent, it will not be a new record, but the trend of severe ice retreat in the western Arctic and north of Eurasia will continue. However, the week 31 projections (Figure 2) suggests there will be some ice in the Northern Sea route and even the Kara Sea (although in low concentrations). This hints that previous projections of an open Northern Sea Route may have been optimistic. While we cannot predict the navigability of the Northwest Passage, there is every indication that M'Clure Strait will be blocked by heavy ice conditions while Amundsen Gulf will be accessible.

Also of note is the presence of some ice in the Chukchi Sea. This range (10-30%) is below what is typically measurable by SSM/I and AMSR-E satellite sensors, but it may be of sufficient thickness for the usual migration patterns of Pacific walrus, in which the females and cubs haul out on the ice floes over the shallow continental shelves while the males remain on the Siberian and Alaskan shore. This is in contrast to prior extreme years in which the ice retreated too far for females to feed, and there were reports of abandoned calves and malnourished females appearing on Wrangell Island and the continental coasts. The summer coastal walrus population included a mix of males and females, when normally they would remain segregated over the summer months.

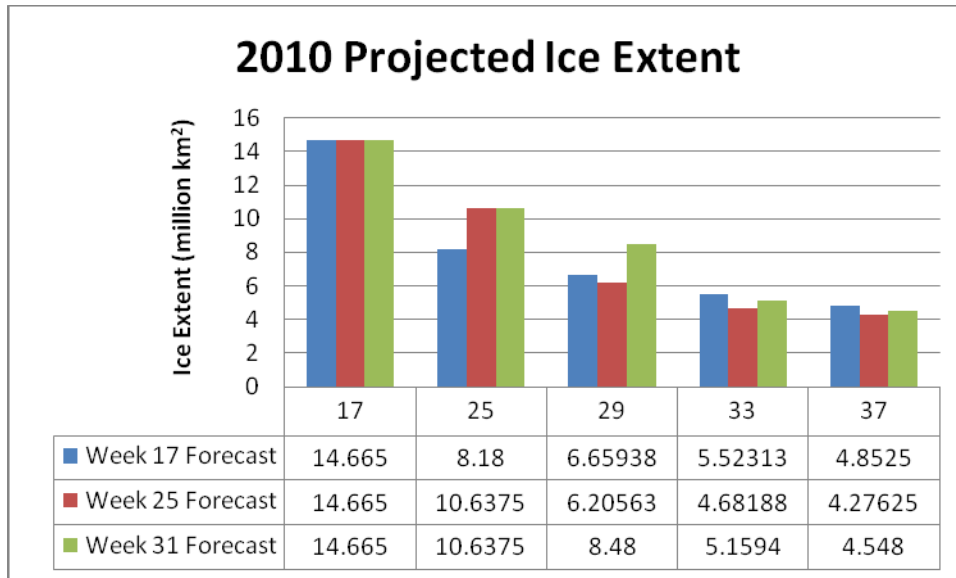


Figure 1: Projected Arctic Sea Ice Extent over summer 2010, based on Week 17 conditions (blue), week 25 conditions (red), and week 31 conditions (green). Week 17 represents actual values for all 3 forecasts (i.e., nowcasts), while week 25 shows actual values for the week 17 and week 31 forecasts.

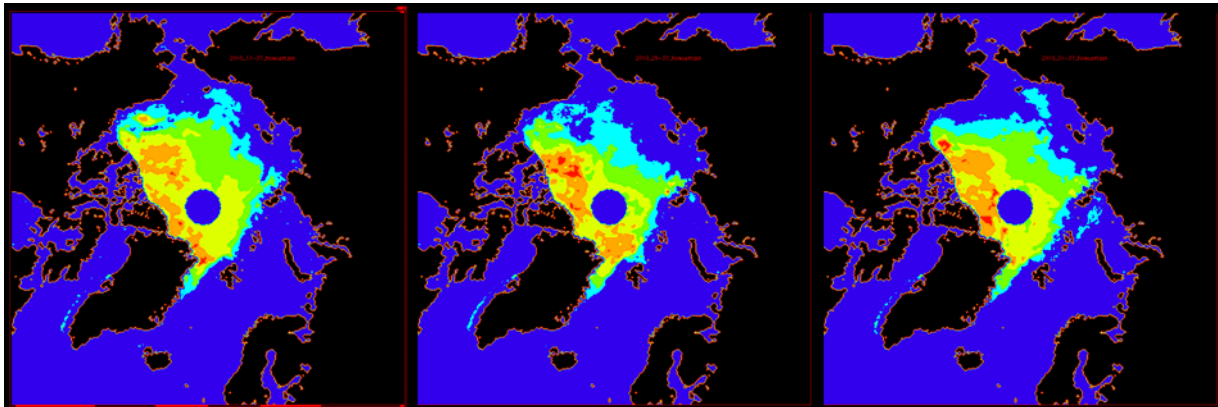


Figure 2: Progression of outlooks for September minimum ice extent for week 37 of 2010, as predicted in week 17 (left), week 25 (middle), and week 31 (right). WMO color codes are given in Figure 3.



Figure 3: WMO Sea Ice Color codes for Ice Concentration.

(CAVEAT: This is not an official National Ice Center forecast and should not be interpreted as advice for navigation. Only ice-capable ships with experienced ice pilots should attempt navigation in the Arctic, and should consult with local authorities for current ice conditions and navigational restrictions.)