

SIO 2011: August Outlook for September Arctic Sea Ice Extent Minimum

Todd Arbetter¹, Sean Helfrich, Pablo Clemente-Colón, Chris Szorc
North American Ice Service/National Ice Center
Suitland, Maryland

¹UCAR Visiting Scientist

Projected Minimum Extent, August Outlook: 4.46 million km² on September 20, 2011

Projected Minimum Extent, July Outlook: 4.33 million km² on September 7, 2011

Projected Minimum Extent, June Outlook: 4.33 million km² on September 20, 2011

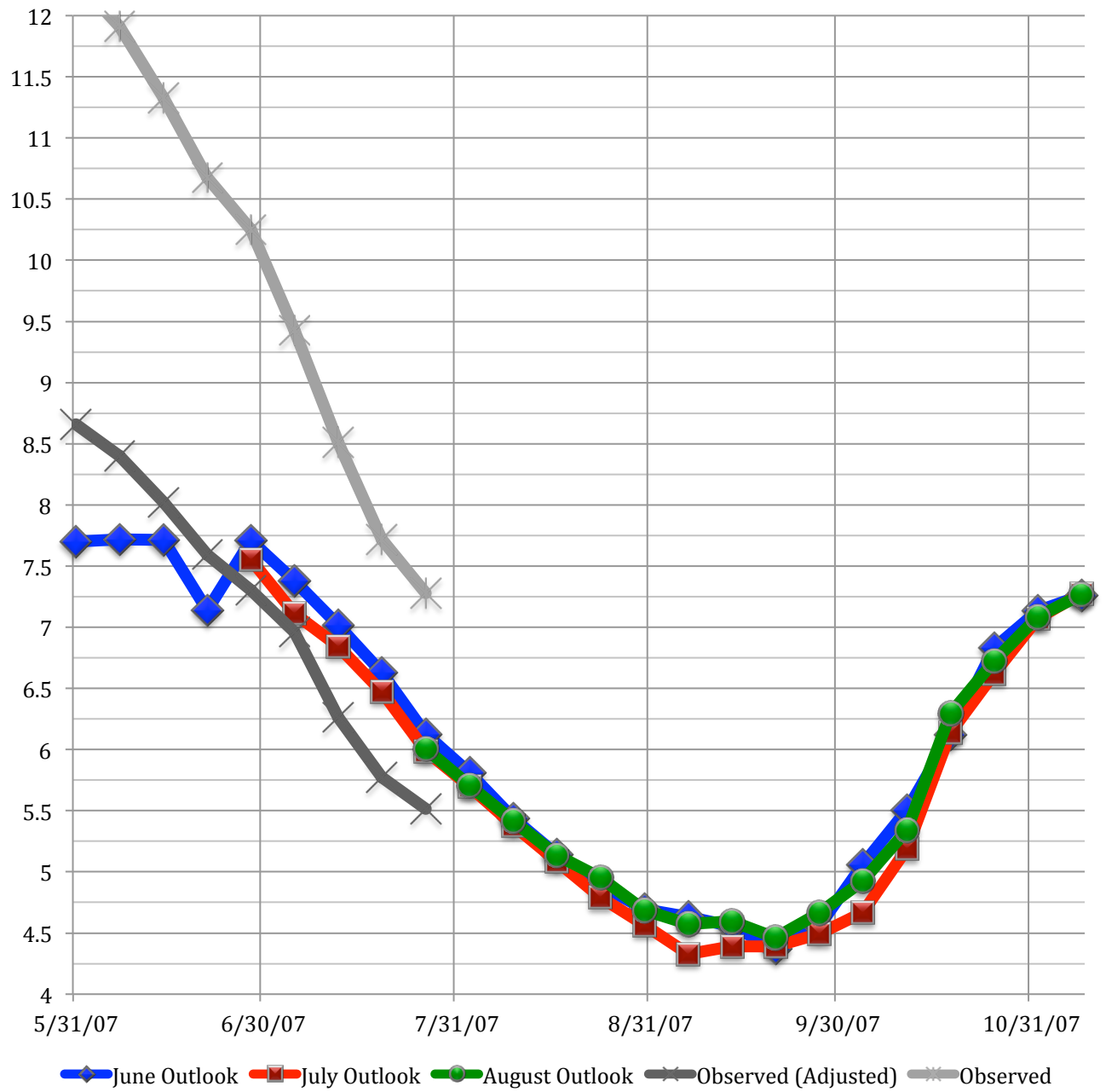
Method: Statistical Forecast Model (NIC Arctic Regional Ice Forecast System)

The August update used conditions from the last week of June, approximating the method used for the standard NAIS (North American Ice Service) Outlook prepared for June 1 (end of May conditions). As in 2010, the August update is more conservative than the July update, predicting a non-record minimum low in September of 4.46 million km² and shifting the date of occurrence back to September 20. The “false minimum” pattern observed by NSIDC for September 2009 and 2010 is reproduced here for 2011, with a September 7 value of 4.57 million km² and a September 14 value of 4.60 million km².

Statistically speaking, the ice extent decreases most rapidly in July before slowing in August and ceasing in September. The June and August outlooks reflect this but the July outlook does not. It is reasonable to expect that this behavior will continue in 2011; however, there is enough evidence to suggest that it may not. Ice Mass Buoys in the Beaufort Sea and North Pole regions have reported 50 cm of surface melt so far this season. In the two years this method has been used, the July outlook has always been the most aggressive. In 2010 the August outlook was the most accurate. Even if this pattern repeats, September 2011 would still be a near-record according to this model.

However, the timing of the outlook does have an effect on the projected minimum value. We are preparing a second August update, using conditions from the end of July. We expect that the magnitude of the projected minimum will change; we are interested to see if it is adjusted downward or upward. As the model is constrained by the past 10 years behavior in the Arctic, the projection of 4.46 million km² could be robust. The ARIFS model consistently underpredicts the actual observed ice area from SSM/I. But when corrected for the areas for which it does not predict, the ARIFS model is actually overpredicting the ice extent for 2011. The August 1 value is actually 500,000 km² lower than any projection. July projections were too high by over a million km² at times, due to faster than projected decrease of ice extent. An additional projection based on end-of-July data will provide insight as to whether the model can respond when initial conditions are already on the edge of anything previously observed.

2011 Arctic Ice Extent By Week



Projected sea ice extent by week, in millions of square kilometers. Observed ice extent to date is shown in light grey, and the corrected ice extent reflecting observations only in the area where the ARIFS model projects ice are show in dark grey.

(CAVEAT: This is not a forecast and should not be interpreted as rules for navigation. Only ice-capable ships with experienced ice pilots should attempt navigation in the Arctic.)