

Predictions of Alaskan Summer Ice Conditions from June 2011

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Here we attempt to predict the ice conditions near Barrow Alaska as listed in Table 4 of the *Seasonal Outlook For North American Arctic Waters Summer 2010* prepared by the North American Ice Service in a collaboration with the Canadian Ice Service, 02 June 2011 (http://www.natice.noaa.gov/products/nais_forecasts.html). The parameters in this table (listed below) are various measures of the amount or duration of open water near Barrow. The predictions are based on the output of a coupled ice-ocean model that provides us with retrospective estimates of the ice and ocean conditions in the Arctic. See the prediction for last month for more explanations of the method.

The Alaskan ice parameters predicted here are

1. Distance from Point Barrow northward to ice edge on 10 Aug (nautical miles).
2. Distance from Point Barrow northward to ice edge 15 Sept (nautical miles).
3. Distance from Point Barrow northward to boundary of five-tenths ice concentration on 10 Aug (nautical miles).
4. Distance from Point Barrow northward to boundary of five-tenths ice concentration on 15 Sept (nautical miles).
5. Initial date entire sea route to Prudhoe Bay less than/equal to five tenths ice concentration (year day).
6. Date that combined ice concentration and thickness dictate end of prudent navigation (year day).
7. Number of days entire sea route to Prudhoe Bay ice free.
8. Number of days entire sea route to Prudhoe Bay less than or equal to five-tenths ice concentration.
9. Number of days between initial opening date and 1 Oct
10. Barnett Ice Severity Index (BIS Index), high numbers indicate large expanses of open water.
11. Rank of the BIS index from 1953 to 2010 (1 is the highest BIS Index, 57 the lowest)

The predictions are essentially unchanged from those made with the end-of-May data. We are again predicting near record low ice conditions near Barrow.

Predictions using data from the end of June 2011

Ice Parameter	predictor	R ²	Prediction	Error
Ice_Dist_10Aug	IC	0.49	99	30
Ice_Dist_15Sep	H	0.65	377	70
Ice_05_10Aug	H	0.69	203	36
Ice_05_15Sep	G1.9m	0.61	425	79
Date_Start	IC	0.44	187	8
Date_End	IC	0.29	298	9
Ndays_Ice_Free	IC	0.46	88	15
Ndays_Ice_05	IC	0.52	118	15
Ndays_Start_to_1	IC	0.43	86	9
BIS_Index	H	0.65	1057	162

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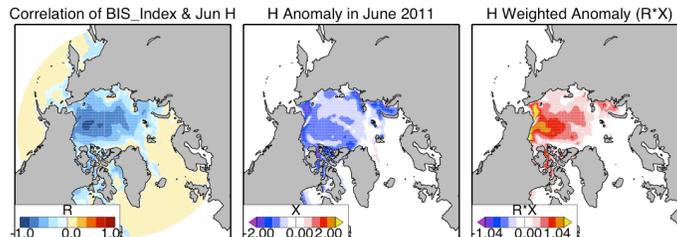
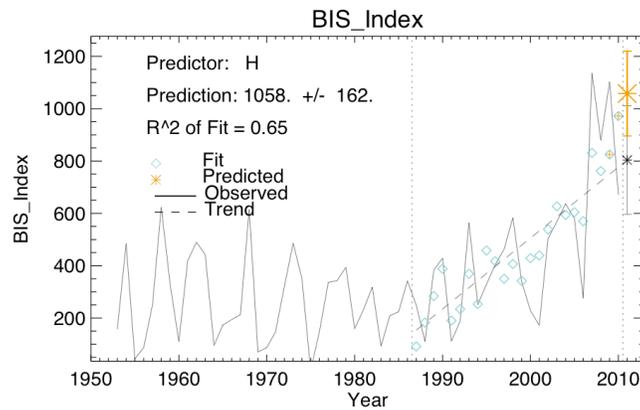


Figure 1. The top panel shows the time series for the BIS index since 1953. The blue dots are the fit of the statistical model using only data since 1987. The orange star is the prediction for 2011 with the error bar shown as well. The black dashed line and the black star are the linear trend line and the trend prediction. The lower maps show the correlation of the BIS Index with the G1.9m parameter, the anomaly of G1.9m in June 2011, and the product of the two which shows where anomalies in G1.9m are influential in determining the prediction. It is the integral of the last map that makes the single predictor variable used in the regression equation created with the historical data.