

Sea Ice Outlook
2018 June Report
Individual Outlook

Name of contributor or name of contributing organization:

Grimm

Is this contribution from a person or group not affiliated with a research organization?

No

Name and organization for all contributors. Indicate primary contact and total number of people who may have contributed to your Outlook, even if not included on the author list.

Robert Grimm, NCEP-EMC Student Internship Program, [Northern Vermont University - Lyndon]

Do you want your June contribution to automatically be included in subsequent reports? (If yes, you may still update your contribution via the submission form.)

Yes

What is the type of your Outlook projection?

Statistical

Starting in 2017 we are accepting both pan-Arctic and pan-Antarctic sea ice extent (either one or both) of the September monthly mean. As in 2016, we are also collecting Alaskan regional sea ice extent. To be consistent with the validating sea ice extent index from NSIDC, if possible, please first compute the average sea ice concentration for the month and then compute the extent as the sum of cell areas > 15%.

a) Pan-Arctic September extent prediction in million square kilometers.

4.26

b) same as in (a) but for pan-Antarctic. If your method differs substantially from that for the Arctic, please enter it as a separate submission.

c) same as in (b) but for the Alaskan region. Please also tell us maximum possible extent if every ocean cell in your region were ice covered.

"Executive summary" of your Outlook contribution (using 300 words or less) describe how and why your contribution was formulated. To the extent possible, use non-technical language.

This method utilizes and compares three regression techniques, described as follows: (1.) A linear regression of the long-term, 1979-2017 September monthly average Arctic sea ice extents. For linear regression, a September 2018 extent value is predicted to be 4.48 (+/-1.09) million square kilometers;

(2.) A quadratic regression of, 1979-2017 September Arctic sea ice extent. For long-term quadratic regression, a September 2018 value is found to be 4.04 (+/- 1.09) million square kilometers;

and, (3.) A short-term, quadratic regression of daily-observed Arctic sea ice extent values from April 1, 2018 - June 9 2018. The short-term quadratic regression, is used to estimate a September 2018 extent of 3.19 (+/- 0.84) million square kilometers.

Brief explanation of Outlook method (using 300 words or less).

Figure 6, from the 2017 June Report -- ("Arctic Sea Ice Extent: time-series": https://www.arcus.org/files/resize/sio/27252/sio2017_june_fig6_combined-700x335.jpg), strongly suggests a quadratic regression pattern. Over the next three months, with the addition of daily-observations of Arctic sea ice extent, I believe the short-term quadratic regression (3.) will prove to be a fairly accurate predictor of September 2018 extent. At this time, there simply is not enough data, which is why the short-term quadratic regression was ignored in this analysis.

Instead, the average of the long-term linear and quadratic regressions (1. and 2.) was used, and a predicted value of 4.26 (+/- 1.09) million square kilometers was ultimately determined.

Tell us the dataset used for your initial Sea Ice Concentration (SIC).

<ftp://sidads.colorado.edu/DATASETS/NOAA/G02135/>

Tell us the dataset used for your initial Sea Ice Thickness (SIT) used. Include name and date.

If you use a dynamic model, please specify the name of the model as a whole and each component including version numbers and how the component is initialized:

If available from your method.

a) Uncertainty/probability estimates:

Median

Ranges

Standard Deviations

+/- 1.09

b) Brief explanation/assessment of basis for the uncertainty estimate (1-2 sentences).

There is little expected skill at this point, as ocean temperature and ice thickness are large influencing factors 3 months out.

c) Brief description of any post processing you have done (1-2 sentences).