Sea Ice Outlook

2023 June Report

Individual Outlook

Name of contributor or name of contributing organization:

University of Washington/APL

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

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.

University of Washington/APL

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.)

[Do you want your contribution for this month to automatically be included in subsequent reports?]

What is the type of your Outlook projection?

Dynamic Model

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.

3.99

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.

Driven by the NCEP CFS forecast atmospheric forcing, PIOMAS is used to predict the total September 2023 Arctic sea ice extent as well as ice thickness field and ice edge location, starting on June 1. The predicted September ice extent is 3.99± 0.40 million square kilometers. The predicted ice thickness fields and ice edge locations for September 2023 are also available.

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

The PIOMAS forecasting system is based on a synthesis of PIOMAS, the NCEP CFS hindcast and forecast atmospheric forcing, satellite observations of ice concentration and sea surface temperature (SST), and CryoSat2 observations of sea ice thickness.

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

Initial SIC is from PIOMAS hindcast that also assimilates satellite SIC (NASA team) available from NSIDC (https://nsidc.org/data/nsidc-0081).

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

Initial SIT is from PIOMAS hindcast that also assimilates CrySat2 SIT data up to April 2020 (http://psc.apl.uw.edu/sea_ice_cdr/).

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:

Pan-Arctic Ice-Ocean Modeling and Assimilation System (PIOMAS, Zhang and Rothrock, 2003), with coupled sea ice and ocean model components. The ocean model is the POP (Parallel Ocean Program) model and sea ice model is the thickness, floe size, and enthalpy distribution (TFED) model (Zhang et al., 2016). Atmospheric forcing is from the NCEP Climate Forecast System (CFS) version 2 (Saha et al., 2014) hindcast and forecast. To obtain the "best possible" initial ice-ocean conditions for the forecasts, we conducted a retrospective simulation that assimilates satellite ice concentration and SST data through the end of May 2023 using the CFS hindcast forcing data. We also assimilated CryoSat2 ice thickness available up to April 2020.

If available from your method.
a) Uncertainty/probability estimates:

Median

Lower error bound

Lower error bound

Standard Deviation

0.4

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

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