Sea Ice Outlook
2018 August Report
Individual Outlook

Name of contributor or name of contributing organization:

NASA GMAO

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

false

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.

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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.)

true

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.

3.91

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.

0.21

"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.

An experiment of the GMAO seasonal forecasting system using CryoSat-2 derived ice thickness predicts a September average Arctic ice extent of 3.93 ± 0.21 million km2. The experiment tests the application of ice thickness data in a near-real time setting for the seasonal forecast system. The forecast suggests a reduced Arctic ice cover for 2018 as compared to 2017.

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

The forecast uses the GEOS_S2S_2.1 coupled system that was modified for this forecast. The model has an approximate grid spacing of ½° in both the atmosphere and the ocean. The ocean data assimilation system is driven by a near real-time atmospheric analysis that is similar to MERRA-2, and uses the Local Ensemble Transform Kalman Filter (LETKF) for assimilation of available observations and along-track ocean altimetry.
A branch of the ODAS system was integrated from 1-January to 31-May that included nudging to CryoSat-2 sea ice thickness fields over the available time period until 02-May. The forecast was initialized on 31-May and used 7 ensemble members based on initial condition perturbations of the atmosphere and ocean states.

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

NSIDC NASA Team, https://nsidc.org/data/nsidc-0081, https://doi.org/10.5067/U8C09DWVX9LM.

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

CryoSat-2 Level-4 Sea Ice Elevation, Freeboard, and Thickness, Version 1, https://nsidc.org/data/RDEFT4/, https://doi.org/10.5067/96JO0KIFDAS8. The data were incorporated into the ODAS over a four month period. The ODAS integrated for an additional 29 days after the end of the CryoSat-2 data period.

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:

Not specified

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

Median

Pan-Arctic: 3.93; Alaska region: 0.24

Ranges

Pan-Arctic: 3.66 - 4.24; Alaska region: 0.00 - 0.41

Standard Deviations

Pan-Arctic: 0.21; Alaska region: 0.18

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

The given uncertainty is the standard deviation of the 7 member ensemble.

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

The model output was re-gridded to the standard Northern Hemisphere passive microwave grid.