Sea Ice Outlook
2020 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?

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.)

Include this submission in the July report only.

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.

4.87

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.

0.98

"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 4.87 ┬▒ 0.28 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 an enhanced ice cover for 2020 as compared to the previous year.

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

The forecast uses a prototype the GEOS_S2S version 3 coupled system that was modified for this forecast. The model has an approximate grid spacing of ┬╝┼¬┬╝ Γ êª in the atmosphere and ┬╝┬│┬╝ Γ êª in 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 that included nudging to CryoSat-2 sea ice thickness fields over the available time period until 2-Apr. The ensemble used a staggered

initialization of every fifth day beginning 01-May for a total of 7 ensemble members.

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

The concentration was initialized with the MERRA-2 sea ice field, which is taken from the OSI SAF product OSI-401-b that is paired with the OSTIA real-time SST analysis.

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

From 1-December 2019 until 2-April 2020, the GMAO Ocean Data Assimilation System (ODAS) had ingested sea ice thickness fields from the CryoSat-2 Level-4 Sea Ice Elevation, Freeboard, and Thickness, Version 1 (doi:10.5067/96JO0KIFDAS8). After that time, the ODAS continued to integrate up to the start point of the forecasts.

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:

[DynamicModelType]

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

Median

Pan-Arctic, 4.81 ; Alaskan region, 1.02

Ranges

Pan-Arctic, 4.45 to 5.31 ; Alaskan region, 0.68 to 1.28

Standard Deviations

Pan-Arctic, 0.28 ; Alaskan region, 0.20

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.