Sea Ice Outlook
2017 July Report
Individual Outlook

Name of contributor or name of contributing organization:

NASA Global Modeling and Assimilation Office (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 Google form.)

No do not use my prediction this month in later months

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.

4.9

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.

N/A

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.

0.90± 0.25; reference area: 4.00

"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 4.90 ± 0.34 million km2. The test examines the application of ice thickness data in a near-real time setting for the seasonal forecast system.

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

The GMAO seasonal forecast is produced from coupled model integrations. The main components of the AOGCM are the GEOS atmospheric model, the MOM4 ocean model, and CICE sea ice model. Daily CryoSat-2 derived ice thickness observations from 1-January through 1-April were inserted into the GMAO Ocean Data Assimilation System (ODAS) based on the model background ice thickness distribution. The forecast model was initialized from five restarts dropped from the ODAS system over the April and May period. Forecast fields were re-gridded to the passive microwave grid for averaging.

Tell us the dataset used for your initial Sea Ice Concentration (SIC). Include name and date (e.g., "NASA Team, May 2017"). We also encourage you to submit initial fields to the dropbox, see https://www.arcus.org/sipn/sea-ice-outlook/2017/june/call in the section on

"Submitting Figures and Gridded Data of Full Spatial Fields (Optional) of Forecasts and Initial Conditions" for detailed instructions. Required if sea Ice concentration is used.

NASA Team for 01-Apr, 16-Apr, 01-May, 16-May, and 31-May 2017

Dataset of initial Sea Ice Thickness (SIT) used (include name and date):

GMAO ODAS ice thickness integrated using CryoSat-2 derived daily ice thickness inserted over the period 1-January to 1-April, obtained from the Goddard Cryospheric Sciences Laboratory (Kurtz et al., 2014).

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:

Model Name: Goddard Earth Observing System Model (GEOS).
      Atmosphere: GEOS AGCM initialized with MERRA-2 and GMAO forward processing NWP analysis.
      Ocean: MOM4 initialized with GMAO Ocean Data Assimilation System (LETKF).
      Ice: CICE4 (LETKF).

If available from your method for pan-Arctic extent prediction, please provide

a) Uncertainty/probability estimate such as median, ranges, and/or standard deviations (specify what you are providing).

0.34

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

The given uncertainty is the standard deviation of the 5 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.