

Sea Ice Outlook
2018 June Report
Individual Outlook

Name of contributor or name of contributing organization:

NRL-NESM

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.

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Total contributors: 4

**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.)**

No

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.

5.9

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.

20.4

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.

0.94

"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.

The projected Arctic 2018 September mean sea ice extent from the Navy Earth System Model is 5.9 million km². This projection is the average of a 10 member time-lagged ensemble using initial conditions from 1 May to 10 May 2018. The range of the ensemble is 5.2 to 6.8 million km². The projected Alaskan Regional 2018 September mean sea ice extent is 0.94 million km² with an ensemble range from 0.32 to 1.18 million km². The projected Antarctic 2018 September mean sea ice extent is 20.4 million km² with an ensemble range from 19.7 to 20.9 million km². Note that our ensemble range does not represent a full measure of uncertainty, and the system is currently in a development stage.

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

We performed ensemble forecasts with the Navy Earth System Model using initial conditions on 2018-05-01 12Z through 2018-05-10 12Z. The atmospheric initial conditions are from NAVDAS-AR (Xu et al. 2005), which is part of the NAVGEM (Hogan et al. 2014) operational suite. The ocean/ice initial conditions are from the Navy's 3Dvar NCODA data assimilation system (Cummings 2005), which is a component of GOFS 3.1 using HYCOM and CICE (Metzger et al. 2014). SSMIS and AMSR2 ice concentrations are assimilated with NCODA (Posey et al., 2015). There was no bias correction performed on the results.

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

Forecasts were initialized from the pre-operational US Navy Global Ocean Forecasting System (GOFS) 3.1 for the ocean and sea ice using the Navy Coupled Ocean Data Assimilation

(NCODA) system. The sea ice model assimilated SSMIS and AMSR2 sea ice concentration products. Atmospheric initial conditions were from the operational NAVy Global Environmental Model (NAVGEM) using the Naval Research Laboratory Atmospheric Variational Data Assimilation System (NAVDAS-AR).

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

The ensemble forecasts were initialized using ice thickness from the GOFS 3.1 restart files on the appropriate start date. Ice thickness products are not assimilated by GOFS 3.1.

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:

Coupled dynamical models

If available from your method.

a) Uncertainty/probability estimates:

Median

5.9 Mkm²

Ranges

5.2 - 6.8 Mkm²

Standard Deviations

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

The uncertainty estimate is the range of the 10 member ensemble, and does not represent a full measure of uncertainty.

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

The Sea Ice Probability (SIP) & Ice-Free Day (IFD) were computed from the NESM sea ice output forwarded to the SIPN Data Portal.