

Sea Ice Outlook
2023 September Report
Individual Outlook

Name of contributor or name of contributing organization:

Climate Prediction Center

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.

Climate Prediction Center

**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.

4.86

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.

0.44

"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 forecast is based on an initialized fully coupled system. Contributing factors include initial oceanic, sea ice and atmospheric conditions, with initial sea ice thickness being the dominant factor.

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

The outlook is produced with NOAA Unified Forecast System prototype 5 (UFSp5; Zhu et al. 2023, <https://doi.org/10.1029/2022GL102392>). The forecast is initialized from the Climate Forecast System Reanalysis (CFSR) for the ocean, land, and atmosphere and from the CPC sea ice initialization system (CSIS) for sea ice. Twenty forecast members are produced. Model bias that is removed is calculated based on 2007-2022 retrospective forecasts and corresponding observations.

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

NASA Team Analysis from NSIDC

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

CPC sea ice initialization system (CSIS)

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:

Whole Model: UFSp5

Atmospheric component: NCEP FV3GFS

Land component: NOAH-MP LSM

Oceanic component: GFDL MOM6

Ice component: CICE6

The ocean, land, and atmosphere components are initialized from the Climate Forecast System Reanalysis (CFSR), and the sea ice component is initialized from the CPC sea ice initialization system (CSIS).

If available from your method.

a) Uncertainty/probability estimates:

Median

4.84

Lower error bound

4.66

Lower error bound

5.09

Standard Deviation

0.12

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

The uncertainty estimate is calculated from the 20-member ensemble.

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

Twenty forecast members are produced. Model bias that is removed is calculated based on 2007-2022 retrospective forecasts.