

Sea Ice Outlook
2021 September Report
Individual Outlook

Name of contributor or name of contributing organization:

PolArctic

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.

PolArctic

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.)

What is the type of your Outlook projection?

ML/Other

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.

4.41

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.

"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.

This is PolArctic's third year submitting to the Sea Ice Outlook. Our September extent prediction is 4.41 million square kilometers. Our efforts are to investigate the usefulness of Artificial Intelligence and Machine Learning (AI/ML) as a predictive tool for Arctic sea ice extent. Hidden and non-linear relationships can be exposed through the use of AI/ML when high quality data is available. NSIDC's daily record of sea ice extent creates the perfect test bed to leverage and assess the power of AI/ML.

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

PolArctic's September SIO extent was generated using our Artificial Intelligence algorithm, and trained with historical NSIDC daily ice extent data. Our initial modeling efforts are to generate high quality seasonal forecasts of daily, spatial and temporal sea ice extents. To calculate our September extent outlook, daily results in September 2021 from our model are averaged.

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

NOAA/NSIDC, Sea Ice Index, Version 3. <https://doi.org/10.7265/N5K072F8>.

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

NA

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:

If available from your method.

a) Uncertainty/probability estimates:

Median

Lower error bound

Lower error bound

Standard Deviation

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

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