

Sea Ice Outlook
2022 July Report
Individual Outlook

Name of contributor or name of contributing organization:

ASIC, NIPR

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.

ASIC, NIPR

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?

Statistical/ML

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.

4.53

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.

Monthly mean ice extent in September will be about 4.53 million square kilometers. Our prediction is based on a statistical way using data from satellite microwave sensor. We used two factors: sea ice redistribution from winter to spring and accumulated absolute value of sea ice divergence. Predicted ice concentration map from July 1 to September 20 is available in our website:

https://www.nipr.ac.jp/sea_ice/e/forecast/2022-07-01-1/

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

We predicted the Arctic sea-ice cover from coming July 1 to September 20, using the data from satellite microwave sensors, AMSR-E (2002/03-2010/11) and AMSR2 (2012/13-2021/22). The analysis method is based on our research. The predictions were based on two factors: “sea ice redistribution from winter to spring,” and “accumulated absolute value of sea ice divergence”. The sea ice redistribution was determined from the sea ice movement from December to the end of May (Kimura et al., 2013), and the accumulated absolute value of the divergence was calculated from daily values for 90 days until the end of May. Then, we calculated the summer ice concentration by multiple regression analysis based on the two factors.

The “accumulated absolute value of sea ice divergence” is an indicator of the ease of sea ice movement. In areas where this value is large, sea ice is expected to be thin and easy to melt, as it is easy for sea ice to move freely. On the other hand, areas where this value is small are covered by firm, thick sea ice and are less likely to melt.

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

10km grid data distributed by Arctic Data archive System (<https://ads.nipr.ac.jp>)

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).