SEA ICE OUTLOOK

2022 July Report

By ASIC, NIPR

Contributor

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Contributors

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Executive summary

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/

Type of Outlook method:

Statistical

Dataset

Ice velocity: Daily sea-ice velocity of Kimura Dataset (Kimura et al., 2013), during December 1 and May 31 for all AMSR-E/AMSR2 years.

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

Prediction of September pan-Arctic extent as monthly average in million square kilometers.

4.53 million square kilometers

Short explanation of Outlook method.

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.

Pan-Arctic sea ice extent anomaly million square km.

+0.08 (4.53-4.45)

Reference

Kimura, N., A. Nishimura, Y. Tanaka and H. Yamaguchi, Influence of winter sea ice motion on summer ice cover in the Arctic, Polar Research, 32, 20193, 2013.

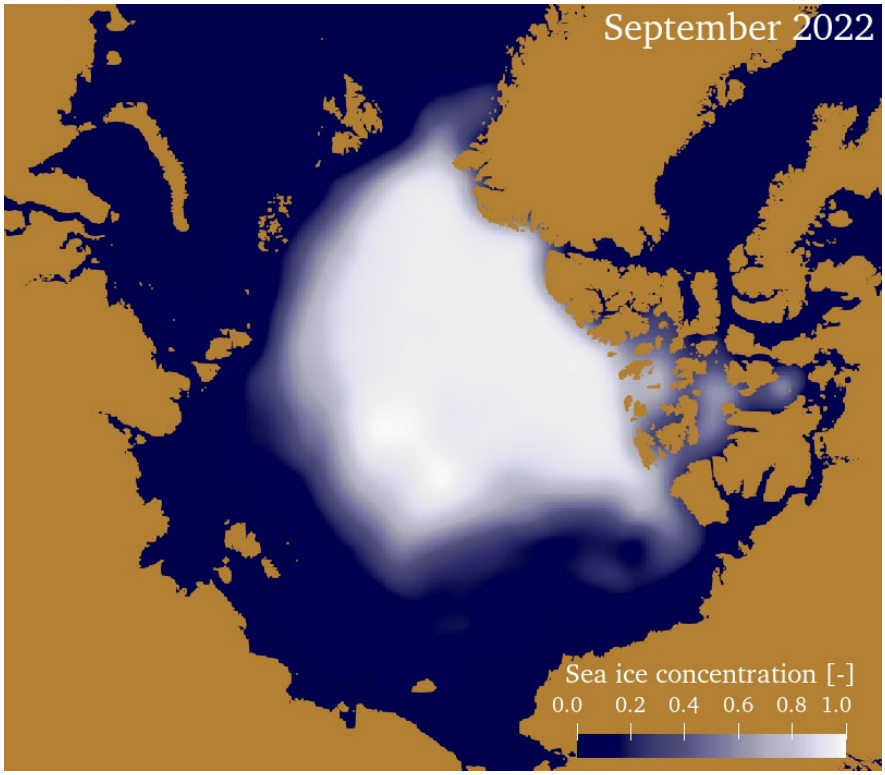

Fig: Predicted monthly-mean ice concentration in September 2022.