Name of contributor or name of contributing organization:

FIO-ESM (Qiao et al.)

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.

Fangli Qiao (First Institute of Oceanography, State Oceanic Administration, China)
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Xunqiang Yin (First Institute of Oceanography, State Oceanic Administration, China)
Ying Bao (First Institute of Oceanography, State Oceanic Administration, China)

Do you want your June contribution to automatically be included in subsequent reports? (If yes, you may still update your contribution via the Google form.)

No do not use my prediction this month in later months

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.

4.45

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.

Our prediction is based on FIO-ESM (the First Institute of Oceanography-Earth System Model) with data assimilation. The prediction of September pan-Arctic extent in 2017 is 4.45 (+/-0.49) million square kilometers. 4.45 and 0.49 million square kilometers are the average and one standard deviation of 10 ensemble members, respectively.

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

This is a model contribution. The initialization is also from the same model (FIO-ESM) but with data assimilation. The data assimilation method is Ensemble Adjustment Kalman Filter (EAKF). The data of SST (sea surface temperature) and SLA (sea level anomaly) from 1 January 1992 to 1 July 2017 are assimilated into FIO-ESM model to get the initial condition for the prediction of the Arctic Sea Ice. There is no sea ice data assimilation.

Tell us the dataset used for your initial Sea Ice Concentration (SIC). Include name and date (e.g., "NASA Team, May 2017"). We also encourage you to submit initial fields to the dropbox, see https://www.arcus.org/sipn/sea-ice-outlook/2017/june/call in the section on "Submitting Figures and Gridded Data of Full Spatial Fields (Optional) of Forecasts and Initial Conditions" for detailed instructions. Required if sea Ice concentration is used.

Dataset of initial Sea Ice Thickness (SIT) used (include name and date):

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:

Atmosphere	CAM3	1992-2017 integration
Ocean	POP2	DA – EAKF DA system
Ice	CICE4	1992-2017 integration
Wave	MASNUM-wave model	1992-2017 integration

If available from your method for pan-Arctic extent prediction, please provide

a) Uncertainty/probability estimate such as median, ranges, and/or standard deviations (specify what you are providing).

Our prediction is 4.45 (+/-0.49) million square kilometers based on 10 ensemble members. 4.45 and 0.49 million square kilometers are the average and one standard deviation of these 10 ensemble members, respectively.

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).