Name of contributor or name of contributing organization:

ECMWF SEAS5

Is this contribution from a person or group not affiliated with a research organization?

false

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.

Steffen Tietsche, ECMWF (primary contact, s.tietsche@ecmwf.int)
Sarah Keeley, ECMWF
Jonny Day, ECMWF

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.)

false

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.

4.97

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 contribution is calculated from the operational ECMWF seasonal forecast from 1st August. This is an ensemble forecast with a global atmosphere-ocean-sea-ice model that is also used for weather forecasting. The model is known to over-predict sea-ice extent in summer, so the average amount of over-prediction for the last 10 years (the so-called bias) of the raw model output has been subtracted to arrive at the number contributed. This bias removal is standard procedure in seasonal forecasting.

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

Initial conditions for the forecast are from the ECMWF operational atmosphere, ocean, and sea-ice analyses. 51 ensemble members are run, constructed from an ensemble of 5 3DVAR-FGAT analyses in the ocean sea-ice, and from an ensemble of 25 4DVAR analyses with singular-vector perturbations added/subtracted for the atmosphere. The resolution of the atmospheric model is about 35km, and about 15km for the ocean/sea-ice model in the Arctic. The September monthly-mean sea-ice extent for the Northern hemisphere is calculated for each ensemble member, and then the ensemble mean is calculated to arrive at the raw forecast value of 5.17 Mio sqkm). A set of re-forecasts of montly-mean September sea-ice extent for 2008-2017 is compared to the NSIDC sea-ice extent for September to estimate the forecast bias as +0.20 Mio sqkm), which is then subtracted from the raw forecast to arrive at the calibrated forecast of 4.97 Mio sqkm that has been submitted as a contribution.

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

initial sea-ice concentration is from OCEAN5, the ECMWF operational ocean/sea-ice analysis. OCEAN5 assimilates observed sea-ice concentration from OSTIA, which is a level-4 observational product derived from the OSI-SAF level-3 sea-ice concentration product OSI-401b.

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

Initial sea-ice thickness is from OCEAN5, the ECMWF operational ocean/sea-ice analysis. SEAS5 does not assimilate any sea-ice thickness observations.

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:

Not specified

 If available from your method.
a) Uncertainty/probability estimates:

Median

bias-corrected median of the ensemble is 4.94 Mio sqkm

Ranges

bias-corrected ensemble minimum/maximum: 4.69/5.33 Mio sqkm

Standard Deviations

ensemble standard deviation is 0.18 Mio sqkm

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

standard deviation of forecast ensemble

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

Forecast has been calibrated by removing its bias estimated from re-forecasts 2008-2017