

Sea Ice Outlook
2017 June Report
Individual Outlook

Name of Contributor of Name of Contributing Organization:

Cawley

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.

Gavin Cawley, School of Computing Sciences, University of East Anglia

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

Yes automatically include my contributions in July and August 2017

What is the type of you outlook projection?

Statistical

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.

4.23 million square kilometers

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 the 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 a purely statistical method (Gaussian Process, related to Kriging) to estimate the long-term trend

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from previous observations of September Arctic sea ice extent. As this uses only September observations, the prediction is not altered by observations made during the Summer of 2016.

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

Non-linear Gaussian process regression model with squared exponential covariance function, hyper-parameters optimised by marginal likelihood maximisation.

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.

ftp://sidads.colorado.edu/DATASETS/NOAA/G02135/north/monthly/data/N_09_extent_v2.1.csv

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:

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).

4.23 +/- 1.14 million square kilometers (95% Bayesian credible interval)

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

Gaussian process models provide credible intervals on model prediction.

c) same as in (b) but for the Alaskan region. Please also tell us the maximum possible extent if every ocean cell in your region were ice covered. See <https://www.arcus.org/sipn/sea-ice-outlook/2017/june/call> in the section on "Instructions for Submitting an Alaskan Regional Outlook" for detailed instructions.

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d) Raw (and/or post processed) forecasts for this year and retrospective forecasts in an excel spreadsheet with one year on each row and ensemble member number on columns (specifying whether raw or post processed).