Name of contributor or name of contributing organization:

McGill (Tremblay, Brunette, Williams)

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.

Bruno Tremblay [1], Charles Brunette [1] (Primary contact), James Williams [1], [1]: McGill University, Department of Atmospheric and Oceanic Sciences, Montreal, Qc., Canada.

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.)

Yes automatically include my contributions in July and August 2017

What is the type of your 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.

3.95

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.

We are studying predictability of sea ice in the Arctic Ocean, with a focus on improving our understanding of predictability on a seasonal timescale. To this end we take approaches entirely based on observations. We are interested in the preconditioning effect that winter sea ice dynamics has on the following summer melt. Williams et al (2016) showed that anomalous Fram Strait sea ice export during winter accounts for roughly 40% of the interannual variability of the September sea ice extent (SIE). We use the DJFMA Arctic Oscillation (AO) index as a predictor variable as a proxy for the Fram Export. The DJFMA AO index is significantly correlated with the winter Fram Strait export anomaly (r=0.55) as well as the monthly mean September SIE anomaly (r =-0.51). We have been following the reports of the Sea Ice Outlook as it is the most comprehensive evaluation of the skill of the sea ice prediction community in predicting the September SIE. We are submitting a forecast this year to add to the number of contributors and to see how we perform alongside other types of predictions.

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

Our prediction for the monthly mean Arctic sea ice extent (SIE) of September 2017 is 3.95 million km^2. We produce the prediction as a sum of the linear trend (climatology) and departure from the trend (interannual variability). We take the long-term linear trend for the 1993-2016 period. We use the mean winter (DJFMA) Arctic Oscillation (AO) index in a linear least squares fit model as a predictor for the anomaly of monthly mean September SIE over the same period. This builds on the idea of winter dynamic preconditioning - see Williams et al. (2016). Since we use the mean DJFMA AO index, our prediction is made on May 1 and does not change during the summer. We use the Sea Ice Index V2 monthly SIE dataset (NSIDC) and the monthly AO index distributed by NOAA.

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.

n/a

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

n/a

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:

n/a

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).

RMSE: 0.472 million km^2

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

We produce and compare hindcasts to the observed monthly mean September SIE for the 1993-2016 period. The adjusted r^2 between the two time series is 0.766. The root mean square error is 0.472 million km^2.

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

n/a