SEA ICE OUTLOOK
2016 Report

Template with Core Requirements for Pan-Arctic Contributions and Guidelines for Submitting Optional Alaskan Regional Outlook, Figures, and Gridded Data

Submission Guidelines:

The submission deadline is 6:00 pm (AKDT) Monday, 13 June 2016 (firm) and all submissions should be sent to sio2016@arcus.org. Contributions received after the deadline will be posted to the website but not incorporated into the Outlook report or discussion.

Questions may be directed to Betsy Turner-Bogren, ARCUS (betsy@arcus.org)

Core Requirements for Pan-Arctic Contributions:

* REQUIRED

1. *Name of Contributor or name of Contributing Organization and associated contributors as you would like your contribution to be labeled in the report (e.g., Smith, or ARCUS (Wiggins et al.)).
   Wanqiu Wang and Thomas Collow

1b. (Optional but helpful for us): Primary contact if other than lead author; name and organization for all contributors; total number of people who may have contributed to your Outlook, even if not included on the author list.

2. * Contributions submitted by a person or group not affiliated with a research organization, please self-identify here:
   N/A____ Yes, this contribution is from "Citizen Scientists."

3. * Do you want your contribution to be included in subsequent reports in the 2016 season?
   ___X_ Yes, use this contribution for all of the 2016 SIO reports (this contribution will be superseded if you submit a later one).
   _____ No, I/we plan to submit separate contributions for subsequent reports.
   _____ No, I only want to participate this time.

4. *"Executive summary" of your Outlook contribution: in a few sentences (using 300 words or less) describe how and why your contribution was formulated. To the extent possible, use non-technical language.
   The contribution here includes (1) Monthly September sea ice extent, (2) Monthly September sea ice extent error estimate, and (3) Date of September minimum. We will try to add other additional/optional items for July and August reports.

5. *Type of Outlook method:
_X_dynamic model ___statistical ___heuristic ____mixed or other (specify)

6. *Dataset of initial Sea Ice Concentration (SIC) used (include name and date; e.g., "NASA Team, May 2016"):
Pan-arctic Ice/Ocean Modeling and Assimilation System (PIOMAS)

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

8. If you use a dynamical model, please specify:

a) Model name: CFSv2pp

b) Information about components, for example:

Component	Name	Initialization (e.g., describe Data Assimilation)
Atmosphere	GFS	Climate Forecast System Reanalysis (CFSR)
Ocean	MOM4p0	Climate Forecast System Reanalysis (CFSR)
Ice	SIS	PIOMAS

c) Number of ensemble members and how they are generated:
Twenty ensemble members are used. The ensemble members are generated from 5 initial dates (8th - 12th of May at 00Z) with four runs from each initial date. The four runs from each initial date include a control run initialized from CFSR and three additional runs with perturbed initial conditions.

d) For models lacking an atmosphere or ocean component, please describe the forcing:
N/A

9. *Prediction of September pan-Arctic extent as monthly average in million square kilometers. (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%.)
4.63

10. Prediction of the week that the minimum daily extent will occur (expressed in date format for the first day of week, taking Sunday as the start of the week (e.g., week of 4 September).
Week of September 11

11. *Short explanation of Outlook method (using 300 words or less). In addition, we encourage you to submit a more detailed Outlook, including discussions of uncertainties/probabilities, including any relevant figures, imagery, and references.
The outlook has been biased corrected. The bias is defined based on hindcasts for 2005 to 2014 from May 8th - 12th with one run from each initial date.

12. 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).

Estimated RMS error of the forecast September sea ice extent is $\pm 0.25 \times 10^6$ km^2.

b) Brief explanation/assessment of basis for the uncertainty estimate (1-2 sentences).
We do not have a systematic measure of forecast performance due to the difference between the hindcast and forecast in ensemble size (20 for the forecast and 5 for the hindcast). The estimate RMS error is based on 2015 forecast with the same configuration as that for 2016.

c) Brief description of any post processing you have done (1-2 sentences).
The outlook has been biased corrected. The bias is defined based on hindcasts for 2005 to 2014 from May 8th - 12th with one run from each initial date.

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).
We have not created such a spreadsheet.