

Sea Ice Outlook  
2017 June Report  
Individual Outlook

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**Name of Contributor of Name of Contributing Organization:**

RASM(Kamal 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.**

Our RASM Team includes the following people:

1. Samy Kamal, primary contact, Naval Postgraduate School.
2. Wieslaw Maslowski, Naval Postgraduate School.
3. Robert Osinski, Institute of Oceanology, Polish Academy of Sciences.
4. Andrew Roberts, Naval Postgraduate School.
5. Mark Seefeldt, University of Colorado.
6. John Cassano, University of Colorado.

**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?**

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.**

4.353±0.214 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.**

Not contributing

**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.**

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Alaskan regional sea ice extent is 0.1607 million square kilometer. Alaskan region total area is 4.012 million square kilometers.

**"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 used the Regional Arctic System Model (RASM), which is a limited-area, fully coupled climate model consisting of the Weather Research and Forecasting (WRF) model, Los Alamos National Laboratory (LANL) Parallel Ocean Program (POP) and Sea Ice Model (CICE) and the Variable Infiltration Capacity (VIC) land hydrology model (Maslowski et al. 2012; Roberts et al. 2014; DuVivier et al. 2015; Hamman et al. 2016; Hamman et al. 2017; Cassano et al. 2017). WRF and VIC are configured on the same polar stereographic grid at 50-km resolution, and POP and CICE are sharing a rotated spherical grid at 1/120 (~9 km).

Before June 2017, reanalysis data is used to force the model from September 1979 through May 2017. Starting in June 1, 2017 NCEP version 2 Coupled Forecast System model (CFSv2) seasonal forecasts are used

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

Twelve seasonal forecast ensemble members were used to determine a pan-Arctic and Alaskan regional ensemble mean September 2017 ice extent. Those were based on three different RASM initial states (or root cases, produced by three different 09/79-05/17 simulations. Each root case was run forward with four different versions of CFSv2 boundary forcing data starting from 06-01-2017 each root case is split to create four ensemble members forced with CFSv2 data initialized on May 30 at hour: 0000, 0600, 1200 and 1800.

**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.**

Initial Sea ice conditions are RASM-produced from multi-decadal simulations, from 1979 through May 2017.

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

Same as #7

**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:**

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Model name: Regional Arctic System Model (RASM).

Atmospheric model: WRF.

Ocean model: POP.

Ice model: CICE.

Land hydrology: VIC

**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 expected uncertainty is about 0.214 million square kilometers.

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

We estimate our uncertainty to be equal to the spread in September mean extent among all the ensemble members.

**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.**

**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).**