

## **Sea Ice, Pan Arctic, Outlook for September 2015 from July Initial Conditions**

### **Contributor Name:**

Barton et al. / Navy's Atmosphere-Ocean-Ice coupled modeling system

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\*Note, the Naval Research Laboratory (NRL) global coupled modeling group includes many more scientists. This author list only represents the main contributors to this report.

### **Executive Summary:**

The projected Arctic minimum sea ice extent from the Navy's global coupled atmosphere-ocean-ice modeling system is 4.5 million square kilometers. This projection is the average of an eight member ensemble. The range of the ensemble is 4.2 to 4.8 million square kilometers. Note that our ensemble range does not represent a full measure of uncertainty, and the system is currently in a development stage.

### **Type of Outlook:**

Dynamical Model

Atmosphere: NAVy Global Environmental Model (NAVGEM)

Ocean: HYbrid Coordinate Ocean Model (HYCOM)

Sea Ice: Community sea ICE Code (CICE)

Coupler: Earth System Modeling Framework (ESMF)

### **September Monthly Averaged Projection:**

4.5 million square kilometers

### **Short Explanation of Outlook Method:**

We ran the Navy's Global Atmosphere-Ocean-Ice coupled system using 12Z initial conditions every day from July 21<sup>th</sup> 2015 to July 31<sup>st</sup> 2015. Each member ran to the beginning of October. Runs starting from July 21<sup>st</sup>, July 25<sup>th</sup>, and July 30<sup>th</sup> were not included in this report due to computer issues. The atmospheric initial conditions are from the Navy's 4Dvar data assimilation system (NAVDAS-AR), which is part of the NAVGEM operational suite. The ocean/ice initial conditions are from the Navy's 3Dvar NCODA data assimilation system, which is a component of the Global Ocean Forecast System (GOFS) using HYCOM and CICE. Ice concentrations are assimilated with NCODA. There was no bias correction performed on the results.

### **Projection Uncertainty/Probability:**

0.6 million square kilometers

### **Short Explanation of Uncertainty Estimate:**

The uncertainty estimate is the range of the ten member ensemble, and does not represent a full measure of uncertainty. Projections of September sea ice extent with this system have not been fully validated.