

Outlook of 9/2009 Arctic sea ice from 7/1/2009

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The predicted September 2009 ice extent is **4.5 million square kilometers**. This is based on ensemble predictions starting on 7/1/2009. The ensemble predictions are based on a synthesis of a model, NCEP/NCAR reanalysis data, and satellite ice concentration data. The model is the Pan-arctic Ice-Ocean Modeling and Assimilation System (PIOMAS), which is forced by NCEP/NCAR reanalysis data. It is able to assimilate satellite ice concentration data. The ensemble consists of seven members each of which uses a unique set of NCEP/NCAR atmospheric forcing fields from recent years, representing recent climate, such that ensemble member 1 uses 2002 NCEP/NCAR forcing, member 2 uses 2003 forcing, ..., and member 7 uses 2008 forcing. Each ensemble prediction starts with the same initial ice-ocean conditions on 7/1/2009. The initial ice-ocean conditions are obtained by a retrospective simulation that assimilates satellite ice concentration data. Of course, no data assimilation is performed during the predictions. More details about the prediction procedure can be found in Zhang et al. (2008) http://psc.apl.washington.edu/zhang/Pubs/Zhang_etal2008GL033244.pdf.

See three figures below.

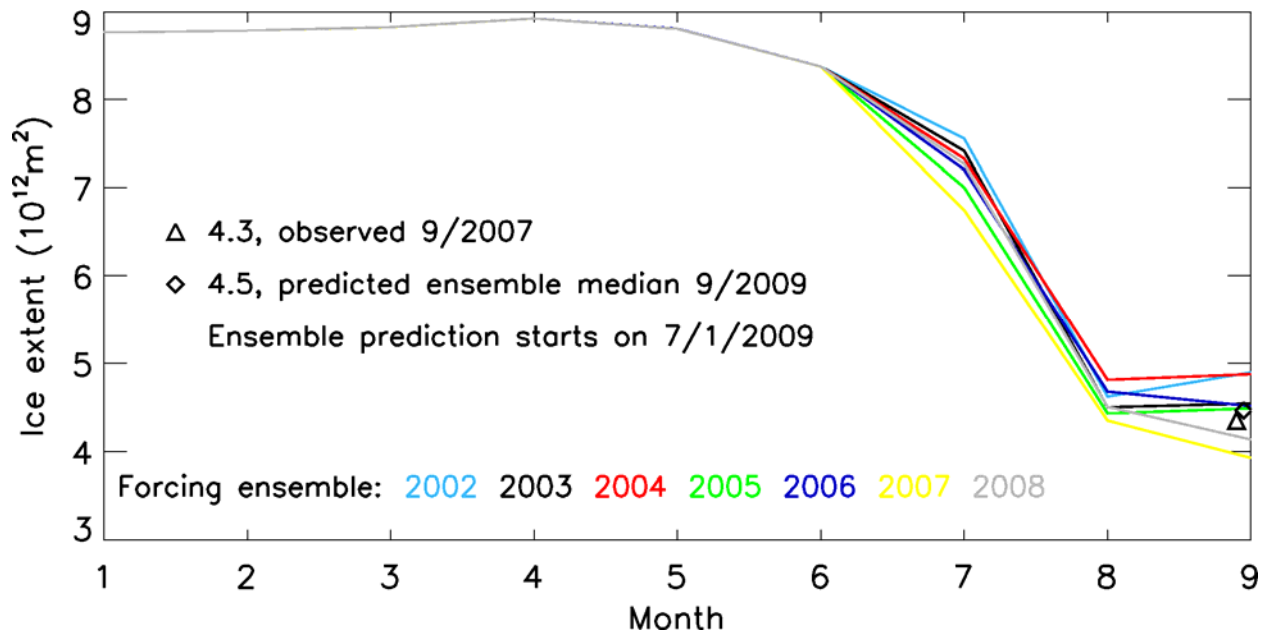


Figure 1. Monthly ice extent over January–September 2009 from seven ensemble members and their ensemble median for September 2009. Results for January–June are from the retrospective simulation and results for July–September are from the ensemble predictions (prediction range is 7/1 – 9/30/2009). The ensemble median is considered to have a 50% probability of occurrence

and the ensemble median ice extent for September 2009 is 4.5 million square kilometers, slightly higher than that in September 2007 at 4.3 million square kilometers.

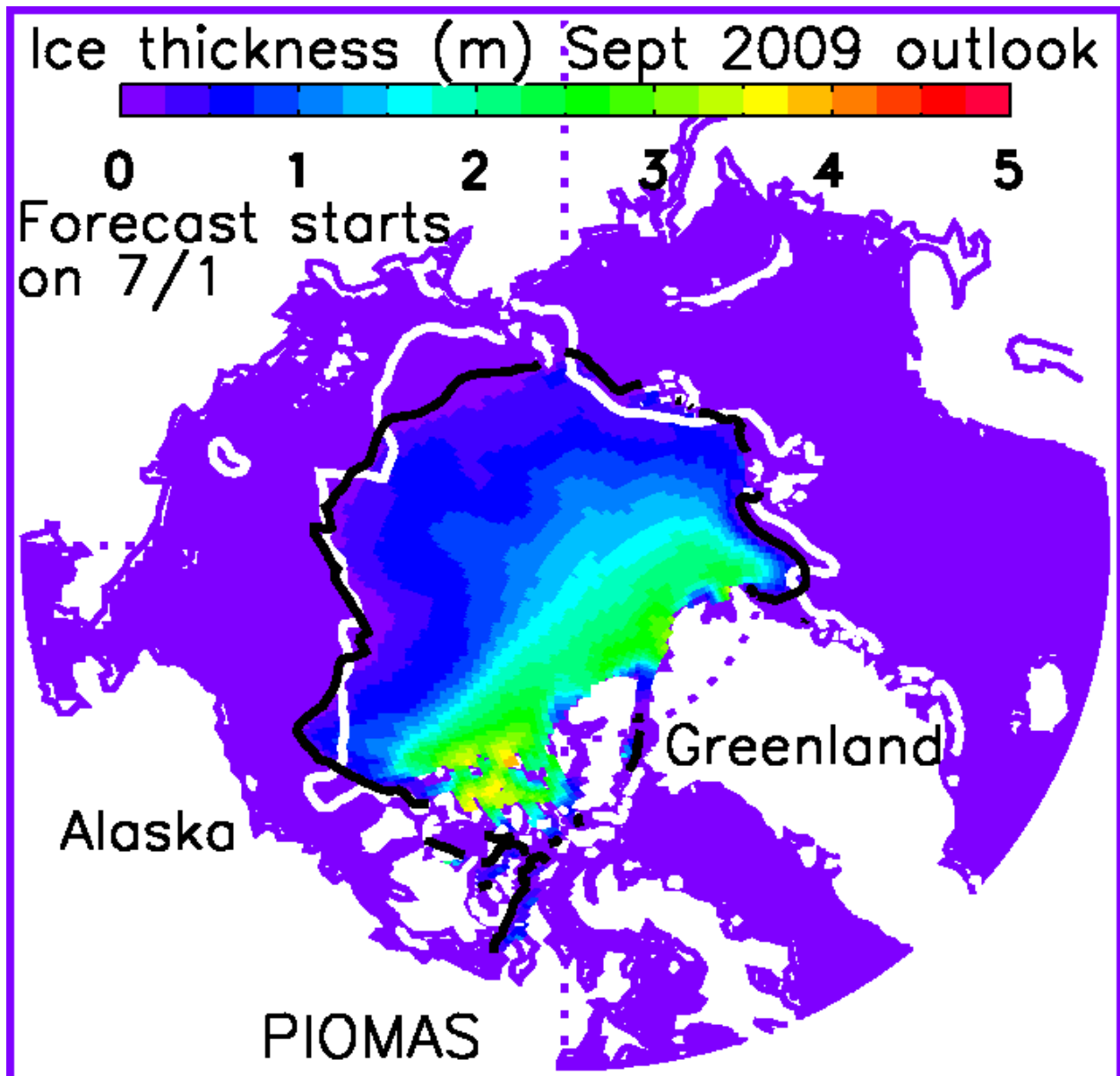


Figure 2. Ensemble prediction of September 2009 sea ice thickness. The white line represents satellite observed September 2008 ice edge defined as of 0.15 ice concentration, while the black line model predicted September 2009 ice edge.

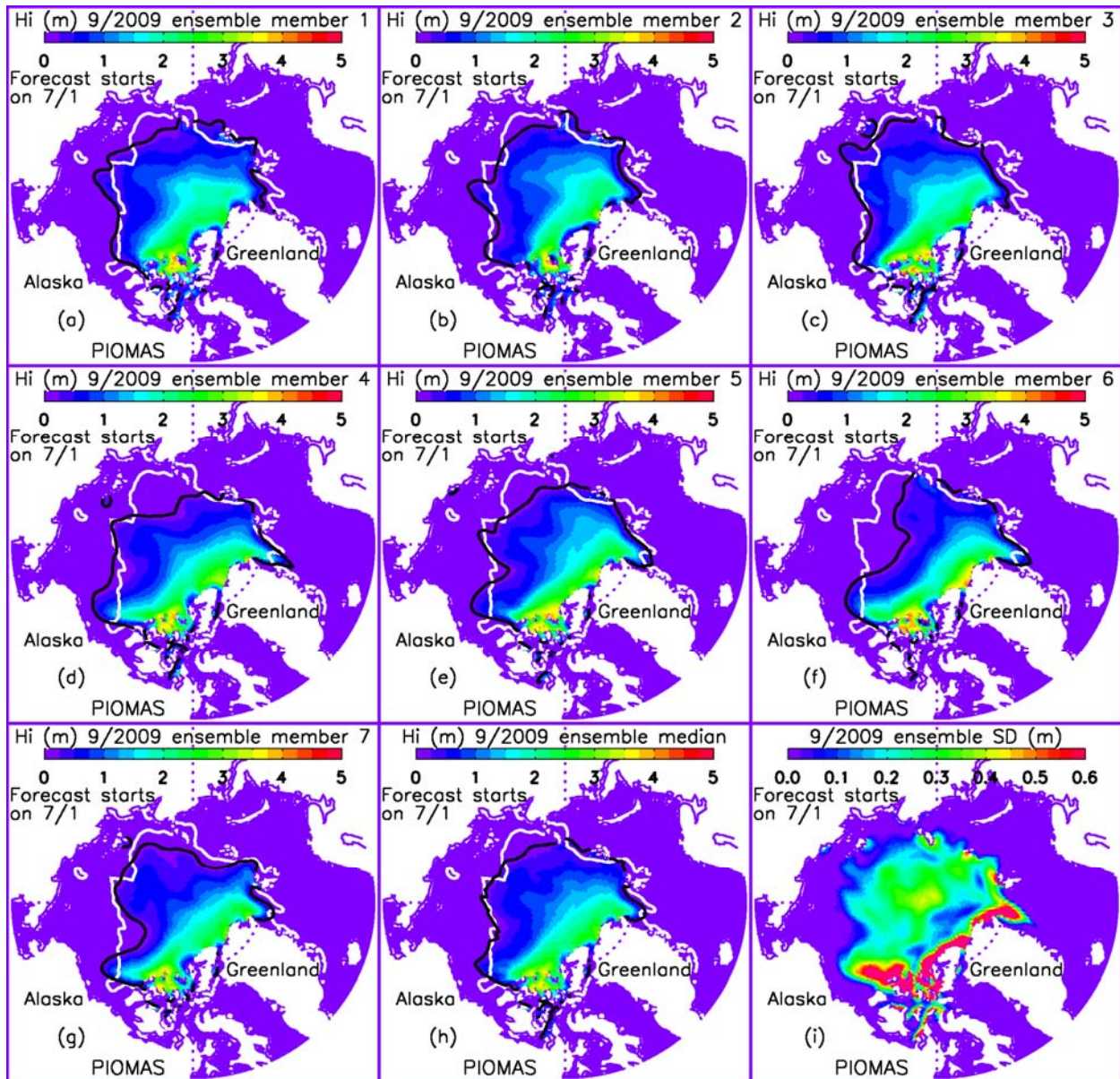


Figure 3. September 2009 sea ice thickness predicted by seven individual ensemble members, ensemble median ice thickness, and ensemble standard deviation (SD) of ice thickness. The spatial ensemble median ice thickness distribution (Figure 3h, the same as Figure 2) is most likely to occur in September 2009.