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The Navy's First Seasonal Ice Forecasts using the Navy's Arctic Cap Nowcast/Forecast System

Ruth Preller
Naval Research Laboratory, US, ruth.preller@nrlssc.navy.mil

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Pamela G. Posey1, Ruth H. Preller1, E. Joseph Metzger1, Richard A. Allard1, David A. Hebert1, Alan J. Wallcraft1, Michael W. Phelps2, Jennifer K. Hutchings3, Ole Martin Smedstad4 and Ryan K. Wilkins5
1 Naval Research Laboratory, Stennis Space Center, MS
2 Jacobs Technology Inc, Stennis Space Center, MS
3 International Arctic Research Center, University of Alaska, Fairbanks, AK
4 United States Naval Academy, Annapolis, MD

As conditions in the Arctic continue to change, the Naval Research Laboratory (NRL) has developed an interest in longer-term seasonal ice extent forecasts. The Arctic Cap Nowcast/Forecast System (ACNFS), developed by the Oceanography Division of NRL, was run in forward model mode, without assimilation, to estimate the minimum sea ice extent for September 2012. The model was initialized with varying assimilative ACNFS analysis fields (June 1, July 1, August 1 and September 1, 2012) and run forward for nine simulations using the archived Navy Operational Global Atmospheric Prediction System (NOGAPS) atmospheric forcing fields from 2003-2011. The mean ice extent in September, averaged across all ensemble members was the projected summer ice extent. These results were submitted to the Study of Environmental Arctic Change (SEARCH) Sea Ice Outlook project (http://www.arcus.org/search/seaiceoutlook). The ACNFS is a $\sim$3.5 km coupled ice-ocean model that produces 5 day forecasts of the Arctic sea ice state in all ice covered areas in the northern hemisphere (poleward of 40° N). The ocean component is the HYbrid Coordinate Ocean Model (HYCOM) and is coupled to the Los Alamos National Laboratory Community Ice CodE (CICE) via the Earth System Modeling Framework (ESMF). The ocean and ice models are run in an assimilative cycle with the Navy's Coupled Ocean Data Assimilation (NCODA) system. Currently the ACNFS is being transitioned to operations at the Naval Oceanographic Office.

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