

Sea-Ice Forecasting: Prospects and Plans

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CCCma



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- Overarching desires:
 1. To coordinate sea-ice (and ocean) modelling activities in Canada (presently many models developed/run in isolation)
 2. To move toward common code for use in various applications (NWP, extended range, seasonal forecasts and climate modelling)
 3. Realize potential forecast skill improvements by including sea ice in forecast system



- We have decided to use CICE as the basis for this (indeed it is already being used experimentally)
 - "CICE" is the community ice model developed at Los Alamos Nat'l Lab (by Elizabeth Hunke and Bill Lipscomb)
 - This code represents the current 'state of the science' and has a large user community and is well-supported.
- There are several existing and planned projects



- An existing effort (CMC/CIS) involves development of sea-ice data assimilation machinery (3D-Var now; moving to 4D-Var system as used in our NWP operations).
 - This is based on another sea-ice code for now, but is being designed for easy transition to other codes.
 - Need adjoint and error covariances
- There is a 'sea-ice research' OPP in EC, with a sub-component on sea-ice modelling, but this is currently un-funded
 - Initial effort making use of existing resources at RPN and CIS
 - A version of CICE has been implemented at CMC
 - Will ultimately be part of coupled forecast system



- Finally, some funding is in place (IPY) to work on sea-ice model improvements for forecasting and climate modelling applications.
 - Objective is to contribute to the 'CICE community'.
 - One goal is to develop improved representation of landfast ice (particularly for Canadian Arctic Archipelago)
 - There is also interest in representation of snow, melt ponds and ice algae (depends on funding)



- Within *GOAPP*, there is a small component in Theme I, dealing with sea-ice. The focus is primarily on the North-Western North Atlantic.
 - Will build upon work underway elsewhere (as described previously)
 - Will focus on implementing *SEEK* filter, estimating error covariances, on evaluation of sea-ice output by comparison with available observations, and on the impacts of sea-ice state on ocean conditions (primarily in Labrador Sea).

