



## **Recent advances in the Mercator-Ocean reanalysis system: Application to an Arctic configuration**

Charles-Emmanuel Testut (1), Gilles Garric (), Jérôme Chanut (), Clément Bricaud (), and Greg Smith ()

(1) Mercator Ocean, Research and Development, Ramonville Saint Agne, France (ctestut@mercator-ocean.fr), (2) Meteorological Research Division, EC, Dorval, Canada

In the framework of the Myocean EU (FP7 and Horizon 2020) funded projects, Mercator Ocean, the French operational oceanography center, is in charge of the development and of the production of real time analysis and forecasts and reanalysis for the global ocean at the resolution of  $1/12^\circ$ . The operational systems are all based on the ocean and sea ice model NEMO and the multivariate data assimilation system SAM2 (Système d'Assimilation Mercator V2). The assimilation method is a reduced order Kalman filter based on SEEK formulation with bias correction scheme for temperature and salinity and an Incremental Analysis Update.

The strong need of a realistic description of the mean state and variability of the rapid changing Arctic Ocean and its adjacent seas over the last decades motivated the use of the Canadian Arctic Ocean and Nordic seas configuration (CREG). This dedicated configuration at  $1/12^\circ$  developed by the Canadian research teams has been coupled to the multivariate data assimilation system SAM2. The objectives of this pan-Arctic platform is both to improve the sea ice assimilation method used in the Mercator Ocean and Canadian analysis and forecasting systems and to produce reanalysis over recent periods at lower numerical cost in order to prepare global higher resolution reanalysis. After a description of this Arctic reanalysis system, we present first results on the abilities of this configuration to reproduce sea ice extent and volume interannual variability without assimilation and, secondly, the impact of assimilating sea ice data on the sea ice cover with short hindcasts experiments.