

**Séminaire mercredi le 12 décembre 2018 11:00 / Seminar Wednesday December 12<sup>th</sup> 2018 11:00h**

**Sujet/Subject:** Providing a Pan-Canadian Regional Ocean Analysis Capacity: A proposed upgrade to the Regional Ice Ocean Prediction System (v2.0)

**Langue/language** : Anglais / English

**Conférenciers/Lecturers:** Gregory Smith (RPN-E)

**Résumé/Abstract**

On November 7, 2016, a \$1.5 billion national program was launched called the Oceans Protection Plan (OPP), to improve marine safety and responsible shipping, protect Canada's marine environment, and offer new possibilities for Indigenous and coastal communities. At the Canadian Centre for Meteorological and Environmental Prediction (CCMEP) this includes the development of an ECCO national operational service desk for aquatic environmental emergency response. An important component of this effort is the development of an enhanced response capacity to spills, including improved numerical modelling of the coastal oceans. Here, we present a proposed upgrade to the Regional Ice Ocean Prediction System (RIOPsv2.0) to provide a pan-Canadian regional ocean analysis capacity and support a number of coastal and near-shore systems in development. The first of these, the Coastal Ice Ocean Prediction System for the West coast (CIOPS-W) will be presented in a second seminar on Thursday, Dec. 13.

Initially, RIOPS was implemented at CCMEP to provide Canada with short-term ice-ocean predictions and hazard warnings in ice-infested regions. As a result, the domain covered only the Arctic and North Atlantic regions. In RIOPsv2.0 the domain is extended to include the North Pacific Ocean providing a pan-Canadian (three oceans) regional ocean forecasting capacity. Moreover, the current spectral nudging approach toward Global Ice Ocean Prediction System (GIOPS) analyses used to initialize the ocean analysis component of the system is updated here to use a multivariate reduced-order Kalman filter that assimilates sea level anomaly, sea surface temperature and in situ profiles of temperature and salinity. This ocean data assimilation system is essentially the same as that used by GIOPS (i.e. the System d'Assimilation Mercator version 2; SAM2), but permits a better representation of coastal processes (e.g. tides, storm surge) and improved sea level variability and surface currents. Here we demonstrate the improvements in the analysis system as compared to both the spectral nudging approach as well as the comparable global analysis system from GIOPS. Particular improvements with respect to GIOPS include the use of higher resolution

error modes, a modified observation operator for online tidal filtering for sea level anomaly observations and a 7-day Incremental Analysis Updating (IAU) procedure. It will be proposed that RIOPS be updated with this system at the next CPOP meeting.