Séminaire ven 11 Fév 2011 11h / Seminar Fri Feb 11th 2011 11h

Conférencier/Lecturer:	Jason Milbrandt
Sujet/Subject:	Towards an Operational High Resolution Deterministic System Forecasting System and its Application
Présentation/Presentation:	Anglais / English
Lieu/Room:	Salle des vents (Dorval)

iweb: http://web-mrb.cmc.ec.gc.ca/mrb/rpn/SEM/
web: http://collaboration.cmc.ec.gc.ca/science/rpn/SEM/index.php

Abstract

Over the past several years, CMC has run various high resolution (2.5 km horizontal grid spacing) limited-area domains over various regions in Canada in real-time, experimental mode. This "GEM-LAM-2.5" system – now referred to as the High Resolution Deterministic Prediction System (HRDPS) – has been used more and more by operational forecasters at Environment Canada and is gradually becoming a mainstream forecast tool in certain regions. In support of operational forecasting for the 2010 Vancouver Olympics (V-10), researchers from RPN and CMC developed a special high resolution GEM-LAM system, with 2.5-km and 1-km grids over the Vancouver-Whistler region. The model output for the V-10 GEM-LAM system was scrutinized every day throughout the games and, to examine its behaviour during the summer, the system was left running throughout the 2010 summer. In addition to serving as a forecast system for the 2010 games, the V-10 system also served as an effective testbed for an upgrade of the HRDPS.

Given the success of the high-resolution GEM-LAM systems for adding forecast value, development is currently underway to make the HRDPS operational. This will occur through two major upgrades to the current system, the first to be proposed at the next CPOP meeting (Feb. 15) for immediate implementation and the second targeted for the end of 2011. This first proposed upgrade involves essentially porting the V-10 configuration of the model to the existing HRDPS, maintaining its experimental status until the second upgrade. In addition, some surface fields – sea-surface temperature, ice fraction, sea-ice temperature, and sea-ice thickness – will be taken from the coupled Gulf-of-St.-Lawrence modeling system (rather than from the Regional analysis) to initialize the 2.5-km Maritime grid. An expansion of the Maritime grid to improve the locations of the lateral boundaries is also proposed.

To test the proposed upgrade, a series of 90 simulations – 15 winter and 15 summer cases on the West, East, and Maritime domains – were run and compared against the archived output from the existing system. Standard ver-

ification scores have been computed for 2-m temperature and dew point temperature, 10-m wind speed and direction, and 6-h QPF. Overall, the proposed system shows a systematic improvement in the RMSE and bias for temperature, humidity, and wind direction. The diagnostic near-surface wind speed, on the other hand, is systematically reduced, and has either or neutral or slightly worse bias scores compared to the current system. The QPF scores computed are either neutral or slightly better. The proposed set of changes will thus result in a general improvement to the HRDPS and its implementation will facilitate, through feedback from users, continued development and improvement of the system towards its eventual switch to operational status.