



Evaluation of an operational water cycle prediction system for the Laurentian Great Lakes and St. Lawrence River

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Environment and Climate Change Canada (ECCC) is implementing new numerical guidance products based on fully coupled numerical models to better inform the public as well as specialized users on the current and future state of various components of the water cycle, including stream flow and water levels. Outputs from this new system, named the Water Cycle Prediction System (WCPS), have been available for the Great Lakes and St. Lawrence River watershed since June 2016. WCPS links together ECCC's weather forecasting model, GEM, the 2-D ice model C-ICE, the 3-D lake and ocean model NEMO, and a 2-D hydrological model, WATROUTE. Information concerning the water cycle is passed between the models at intervals varying from a few minutes to one hour. It currently produces two forecasts per day for the next three days of the complete water cycle in the Great Lakes region, the largest freshwater lake system in the world. Products include spatially-varying precipitation, evaporation, river discharge, water level anomalies, surface water temperatures, ice coverage, and surface currents. These new products are of interest to water resources and management authority, flood forecasters, hydroelectricity producers, navigation, environmental disaster managers, search and rescue teams, agriculture, and the general public. This presentation focuses on the evaluation of various elements forecasted by the system, and weighs the advantages and disadvantages of running the system fully coupled.