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Development of the MESH modelling system for hydrological ensemble forecasting of the Laurentian Great Lakes at the regional scale

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Abstract. Environment Canada has been developing a community environmental modelling system (Modélisation Environnementale Communautaire – MEC), which is designed to facilitate coupling between models focusing on different components of the earth system. The ultimate objective of MEC is to use the coupled models to produce operational forecasts. MESH (MEC – Surface and Hydrology), a configuration of MEC currently under development, is specialized for coupled land-surface and hydrological models. To determine the specific requirements for MESH, its different components were implemented on the Laurentian Great Lakes watershed, situated on the Canada-US border. This experiment showed that MESH can help us better understand the behaviour of different land-surface models, test different schemes for producing ensemble streamflow forecasts, and provide a means of sharing the data, the models and the results with collaborators and end-users. This modelling framework is at the heart of a testbed proposal for the Hydrologic Ensemble Prediction Experiment (HEPEX) which should allow us to make use of the North American Ensemble Forecasting System (NAEFS) to improve streamflow forecasts of the Great Lakes tributaries, and demonstrate how MESH can contribute to a Community Hydrologic Prediction System (CHPS).

◻ Final Revised Paper (PDF, 1467 KB)   ◻ Discussion Paper (HESSD)

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