



McGill



Environment
Canada

Hydrologic Ensemble Prediction : experimental design

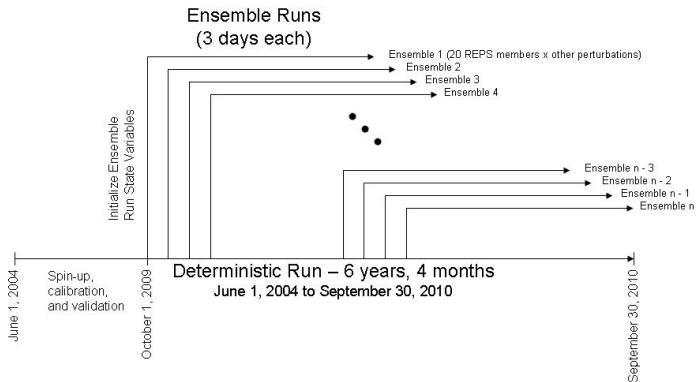
Bruce Davison

Peter Yau, Vincent Fortin, Al Pietroniro and Robert Leconte

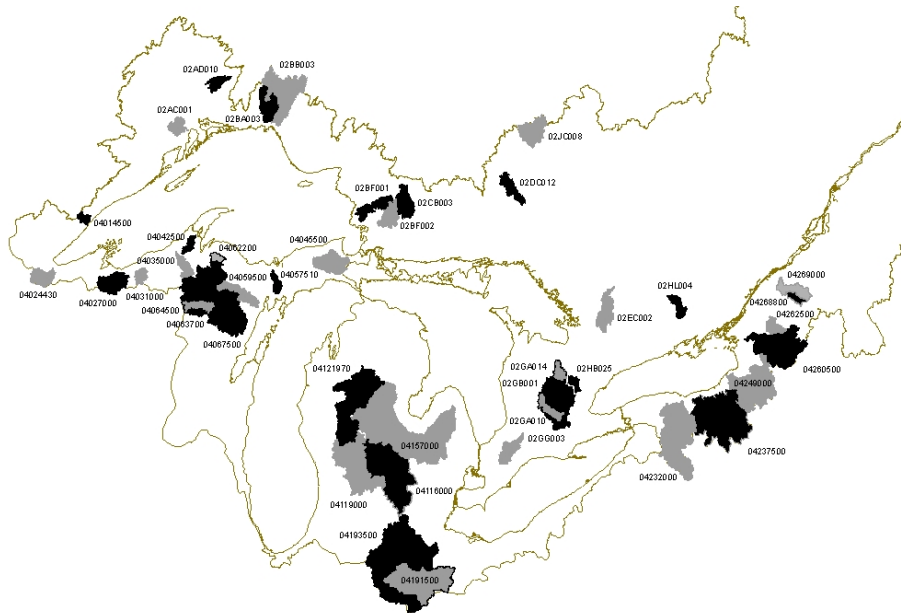
McGill University - Environnement Canada

HEPEX workshop - June 8, 2011

The Hydrological Ensemble Prediction System (H-EPS)



The Great Lakes Basin and Sub-Basins



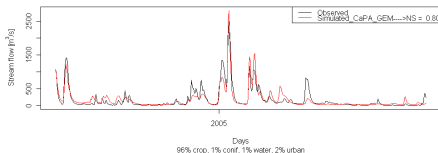
Very Preliminary Results

Standalone
MESH

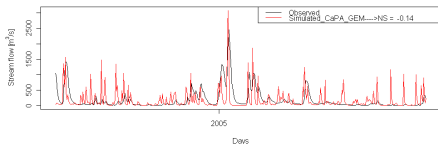
MEC-MESH -
ISBA

MEC-MESH -
CLASS

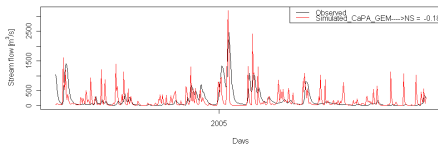
4193500: Maumee River at Waterville, OH (16,409 km²)



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Future Work

WP1 Contribute to the verification of mesoscale (35 km) ensemble precipitation forecasts through the analysis of hydrological observations

Enhanced H-EPS - Uncoupled from the Atmospheric Model

- Respectable model calibration
- CaPA for precipitation in the calibration run (data assimilation of obs + climatological consistency of forcing fields)
- CLASS land surface scheme within MESH
- REPS forcing for H-EPS
- perturbation of surface initial conditions (soil moisture and temperature)
- perturbation of precipitation field using EnKF (Carrera et al., 2009)

Full Uncertainty H-EPS Uncoupled from the Atmosphere

Full Uncertainty H-EPS Coupled with the Atmosphere

Future Work

WP1 Contribute to the verification of mesoscale (35 km) ensemble precipitation forecasts through the analysis of hydrological observations

Enhanced H-EPS - Uncoupled from the Atmospheric Model

Full Uncertainty H-EPS Uncoupled from the Atmosphere

- Perturbations : Model forcing and initial conditions (as in previous step)
- Additional perturbations : Land surface schemes, physics and parameters

Full Uncertainty H-EPS Coupled with the Atmosphere

Future Work

WP1 Contribute to the verification of mesoscale (35 km) ensemble precipitation forecasts through the analysis of hydrological observations

Enhanced H-EPS - Uncoupled from the Atmospheric Model

Full Uncertainty H-EPS Uncoupled from the Atmosphere

Full Uncertainty H-EPS Coupled with the Atmosphere

- Hydrologic perturbations : models, initial conditions, physics and parameters
- Atmospheric perturbations : initial conditions, physics and parameters
- Similar to Dr. Christophe Lavaysse, but for streamflow