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The Environmental Fluid Dynamics Lecture Series Presents:

A Seminar with

Martyn Clark, Professor, Associate Director  
Centre for Hydrology and Coldwater Laboratory

University of Saskatchewan

Tuesday, August 11, 2020

11:10am-12:25pm Via Zoom



*Probabilistic simulations and predictions of hydrological processes over North America*

**Abstract**

As part of the Global Water Futures project, there is an initiative underway to improve probabilistic simulations and predictions of hydrological processes across North America. This presentation will summarize recent progress in this effort, focusing on recent work to: (1) develop a new probabilistic meteorological forcing dataset for North America; (2) develop model-agnostic workflows to configure hydrological and land models across large geographical domains; (3) develop a comprehensive model benchmarking system, including synthetic test cases to check the equations are implemented properly, process-based model evaluation to evaluate the fidelity of model simulations and identify model weaknesses, and benchmarks to quantify the information content in data and models; (4) improve the numerical implementation of land models; (5) improve continental-domain network routing models, including parallelization of hierarchical river networks, incorporation of lakes and reservoirs, and developing capabilities for multi-scale simulation; (6) advance capabilities for parameter estimation and data assimilation; and (7) understand the predictability of streamflow, including the elasticity of predictability, to understand the benefits that will arise from improving specific components of probabilistic streamflow forecasting systems, in order to guide science investments. This model development work is targeted toward water security assessments, applications in streamflow forecasting, and improving the representation of hydrological processes in Earth System models.

**Bio**

Martyn is a Professor of Hydrology at the University of Saskatchewan, Associate Director of the University of Saskatchewan's Centre for Hydrology and the Canmore Coldwater Laboratory, Editor-in-Chief of Water Resources Research, and Fellow of the American Geophysical Union. Martyn's research focuses in three main areas: (i) developing and evaluating process-based hydrologic models; (ii) understanding the sensitivity of water resources to climate variability and change; and (iii) developing next generation streamflow forecasting systems. Martyn has authored or co-authored over 175 journal articles since receiving his PhD in 1998.