Funded PhD Positions – Open-Source Modelling of Compound Coastal Flooding and River-Ocean (Bay) Interactions

The Coastal Hydrology Lab at Dalhousie University is seeking applications for two fully funded graduate student positions. While PhD students are preferred, exceptional MSc students will also be considered. The projects are funded through a new research partnership between several Canadian universities, Public Safety Canada, and the Natural Sciences and Engineering Research Council of Canada.

Project description and objectives: This project is part of OPEN-FRANC (Open-Source Flood Risk Analysis Network for Canada), with the overall program goal of advancing Canada's capability to assess and manage flood hazards by harmonizing and upscaling floodplain modeling across the country. The specific study site for the work at Dalhousie University is the Bay of Fundy, which has the world's highest tides. The focus site along the Bay of Fundy is the Chignecto Isthmus, which links New Brunswick to Nova Scotia and contains critical infrastructure and important agricultural land. The PhD students recruited for the advertised positions will focus on either (1) numerical modeling of ***compound coastal flooding dynamics*** along the Bay of Fundy shoreline or (2) the ***interactions between river flooding and coastal flooding*** in rivers discharging into the Bay of Fundy (linking river and coastal hydraulic models). Key outcomes of the overall program will be unified computational capacities, developed flood hazard products and predictive tools, integrative data services, and improved geospatial intelligence.

The two PhD students will join a national team of postdoctoral researchers and graduate students in OPEN-FRANC, and will especially work with other team members at the University of Calgary and University of British Columbia involved in the coastal flooding work package. The students will use global datasets and local, high-resolution data to perform simulations considering river flow, waves, surges, tides, and sediment transport. For the coastal models, a range of models, including spectral wave models, hydrodynamic models, phase-resolving wave models, and reduced physics approaches will be considered. Team members will contribute to Canada's emerging approach for flood hazard prediction and management.

Candidate qualifications, application documents, and conditions of employment: The ideal candidate will have numerical modeling experience in riverine or coastal flooding (or a passion and aptitude to develop such skills), excellent communication skills, relevant degrees in geoscience, coastal science, or engineering or a related field, experience with coding, and a team-oriented approach to research. The researcher will receive a competitive stipend, required computational resources/infrastructure, and support for attending international conferences. We value diversity and encourage all qualified people to apply. Applications (CV, transcript, other material) can be submitted via the Google Form. Only applicants short-listed for an interview will be contacted.