Hydroclimatic projections for hydropower infrastructures - snow and maximal probable flood

Record number : OPR-1064

Overview

RESEARCH DIRECTION

Marie-Amélie Boucher, Professeure - Department of Civil and Building Engineering

INFORMATION

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ADMINISTRATIVE UNIT(S)

Faculté de génie
Département de génie civil et de génie du bâtiment

LEVEL(S)

3e cycle

LOCATION(S)

Campus de Sherbrooke

Project Description

The availability of reliable estimates of snow water equivalent is crucial for the management of hydroelectric facilities, but also for the estimation of the probable maximum flood (PMF), which is a crucial information required for dam design and safety analyses. The two concepts (snow water equivalent and PMF) are linked. However, the methods currently used to estimate snow water equivalent for long-term forecasts assume climate stationarity, a concept that no longer holds up in the current context of climate change. Will there still be snow in Quebec in 100 years? This is one of the questions that this research project will seek to answer, based on the previous work of Prof. Boucher's team in snow modeling, which will need to be adapted for use in hydro-climatic projection. The new method to estimate snow water equivalent will need to be consistent with its use for estimating the PMF. Thus, this project has two components: the first component (the most important) concerns the development of a hydroclimatic projection method to estimate snow water equivalent in the long term (100 years from now), and the second component (secondary) consists of aligning this new method with the estimation of the CMP.

The ideal candidate must be proficient in programming (Python), in hydrology, teamwork, have good communication skills, be resourceful, respectful and creative. A master's degree in hydrological and/or meteorological modeling is essential. Knowledge of French is a major asset.

The project could begin in September 2024 or later.

Discipline(s) by sector

Sciences naturelles et génie

Génie civil

Funding offered

Yes

25,000 + performance bonus

Partner(s)

Hydro-Québec

The last update was on 18 June 2024. The University reserves the right to modify its projects without notice.