

2022-2023 MES/MESc Speaker Series

Enhancing simulation of climate change impact on streamflow using water stable isotopes

Date: Thursday, April 6, 2023 **Time:** 4:00-5:00 pm

Zoom Link: <https://us06web.zoom.us/j/86377473019?pwd=aXkwZEpaLzZjV3p2SHdieVBNMkp1UT09>

Or In person: A252-C (The Sandbox, in the Teaching Hub)

Presenter: Arghavan Tafvizi, PhD Candidate, Laurentian University Living With Lakes Centre.

The heterogeneity in landcover and geology in Precambrian Shield watersheds, along with regional differences in future climate projections are anticipated to result in significant complexity in climate change impacts on water resources. In response to very limited regional studies of climate change impacts on groundwater and surface water contributions to streamflow, we have focused our work on source water partitioning to streamflow. The Sturgeon River-Lake Nipissing watershed (12,000 km²) is a headwater to Georgian Bay, Lake Huron, and we analyze streamflow contributions by using a distributed hydrological model (isoWATFLOOD) under a range of different climate predictions. We employ eight different GCMs and RCPs 4.5 & 8.5 over three time-periods between 2020 to 2082. We study potential climate change effects across 11 separate catchments. isoWATFLOOD uses both discharge and stable isotope ($\delta^{18}\text{O}$ and $\delta^2\text{H}$) values of streamflow across multiple catchments for calibration and validation. Using water stable isotopes helps to have more realistic simulation of hydrological processes.

Arghavan Tafvizi is a PhD student in the Boreal Ecology program at Laurentian University, and a member of the Department of Biology and Living With Lakes Research Centre. Her research interests include study of impacts of landuse and climate on streamflow and watershed hydrology, distributed hydrological modeling, use of stable water isotopes to improve model performance, and agricultural water use management.

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