

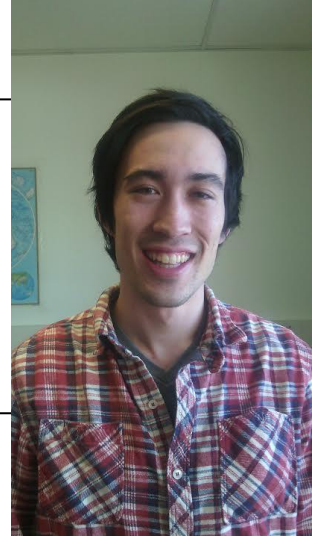
Elucidating climate forcing oscillations in water discharge across the temperate biome

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Abstract

Models can be used to forecast large-scale ecological change, but physical processes are often complex and contain hidden frequencies at different times. Our goal is to develop models that characterize water discharge across time and space, and relate observed changes to large-scale natural oscillations including the El Niño, North Atlantic, Pacific Decadal and Atlantic Multidecadal Oscillations, which may be affecting water discharge. We use wavelet analysis, which allows us to understand not only which oscillations are occurring but also when they are occurring. By decomposing water discharge time series into frequency and time sub-space, we can relate causes of seasonality to large-scale oscillations. We know of no other study that evaluates the effects of these oscillations at a continental scale. By conducting a large-scale study, we may discover differences among sites that may have otherwise been missed.

Keywords: Discharge, catchment, wavelet analysis, time series, LTER.

Geographic Location:

Acadia Research Forest, ME, USA

Archer Watershed, NY, USA

Baltimore Ecosystem Study, MD, USA

Bear Brooke Watershed, ME, USA

Coweeta, GA/NC

Dorset Research Center, ON, CAN

Experimental Lakes Area, ON, CAN

Fernow Experimental Forest, WV, USA

Harvard Forest, MA, USA

Hermine, QC, CAN

Hubbard Brook, NH, USA

Kejimikujik National Parks, NS, CAN

Lac Clair, QC, CAN

Lac Laflamme, QC, CAN

Lac Tirasse, QC, CAN

Leading Ridge, PA, USA

Marcell Experimental Forest, MN, USA

Mont St-Hilaire, QC, CAN

Neversink Research Watershed, NY, USA

Noland Divide, TN/NC, USA

Santee Experimental Forest, SC, USA

Sleepers River Watershed, TN, USA

Turkey Lakes Watershed, ON, CAN

Walker Branch Watershed, TN, USA

How does your project link to Canadian aquatic ecosystem services?

Aquatic ecosystems can be used to control floods and by characterizing water discharge. We have the potential to inform effective management practices.