



# ses

school of environmental sciences

The Research Seminar Presentation by

**Olivia Kaminski**

will be held on

**Tuesday April 3, 2018**

**At 1:00pm**

**ALEXANDER HALL 265**

## Developing a wireless monitoring network for soil thermal properties using Arduino technology

### Abstract

Difficulties measuring soil heat flux ( $G$ ) and soil heat storage ( $\Delta S_s$ ) are associated with their high spatial variability. The number of  $G$  measurements made using heat flux plates (HFP) is often limited by cost and practicality, reducing the spatial variability captured. A network of heat pulse probes (HPP) has been used successfully to measure spatial variability of soil thermal properties. However, both HFP and HPP methods are spatially constrained by wired connections needed for datalogging. Open-source technology, such as Arduino, has been used to develop wireless sensors with datalogging through radio signals. The proposed research aims to evaluate the accuracy of a wireless network of HPPs built using Arduino technology to measure the spatial variability of soil thermal properties. The wireless network will be tested at the Elora Research Station in a 6 ha continuous cornfield from June 2018 to August 2018. This research can improve our measurement capacity of  $G$  and  $\Delta S_s$  and demonstrate the feasibility of using low-cost Arduino technology for environmental monitoring.

Everyone is welcome to attend

(This is a Research Proposal presentation by students in ENVS\*6900)