

SES Fall Seminar Series

Dr. Merrin L. Macrae

Dept. of Geography and Environmental
Management, University of Waterloo, ON



'Impacts of tile drainage and agricultural management practices on the mobilization of phosphorus from fields in Ontario'

Agricultural systems are a source of pollutants to downstream water bodies, leading to the degradation of water quality in these systems. This has implications for the environment, human health and the economy. Excess phosphorus (P) levels have been associated with increases in the frequency of Harmful Algal Blooms in many freshwater lakes. Changing land management practices such as assisted (tile) drainage (free drainage or controlled drainage), tillage, P application method and timing, and the use of cover crops can affect the transfer of both dissolved and sediment-bound P in the environment during runoff events. This is particularly important during the spring snowmelt period in regions with severe winter conditions such as those in the Great Lakes region of North America. The objective of this seminar is to demonstrate the role of tile drainage in phosphorus mobilization from fields under corn-soybean-winter wheat rotation in Ontario, and to evaluate the impacts of climate drivers, soil type and land management practices on phosphorus losses. Data collected over four years demonstrated that both runoff and phosphorus losses occurred primarily during winter thaws/spring snowmelt period, although spring and autumn storms periodically led to significant losses, particularly following P application. With the exception of very wet years (*e.g.* 2013), summer losses were small across the sites and years. In general, annual phosphorus losses in tile drain effluent were small across the study sites, and tile drains exported disproportionately less phosphorus than surface runoff when the relative contributions of the pathways to runoff volumes are considered. Phosphorus losses were unaffected under no-till management relative to tilled management. This will be discussed and related to both soil type and specific management practices at the sites. The potential for cover crops to modify phosphorus losses will also be discussed. These findings are important as they shed light on the role of various agricultural management practices in affecting sediment and dissolved P losses in temperate climates with severe winter conditions, such as Ontario.

Friday
October 16,
2015
3:30 - 4:30 pm
Alexander Hall
Room 218

All are welcome to attend!



ses

school of environmental sciences

