

SES Guest Seminar
Friday November 8, 2019
11:30 pm to 12:30 pm
Alexander Hall, Room 265
(ALL ARE WELCOME, Bring your lunch)

Evolutionary Toxicology: Using daphnia from the past to understand future impacts of environmental stressors

Long-term exposure to environmental contaminants can cause genetic adaptations in populations of aquatic organisms. Evolutionary toxicology and resurrection ecology offer powerful tools for the investigation of changes in sensitivities and adaptive trajectories of populations exposed to contaminants and environmental stressors over decades to centuries. Dormant resting eggs produced by *Daphnia* species as a result of unfavourable environmental conditions are archived in sediments and can be dated and hatched to produce clonal lineages (i.e., same genotypes) of historical populations. However, these tools have not previously been used to examine impacts from environmental contaminants, particularly in combination with the changes in temperature that are expected to occur with future climate change scenarios. Our research examines how genotypes of clonal lineages of *Daphnia* species from single populations, separated through generations of evolution, differ in their response to exposure of environmental stressors. The genomic analysis of tolerant and non-tolerant *Daphnia* populations helps to elucidate the micro-evolutionary adaptations of genes in response to changing environments, providing further insight into the mechanisms of stress tolerance and adaptation.

Dr. Sarah Crawford

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Dr. Crawford's research focuses on understanding the effects of long-term contamination in the environment on natural populations in lake systems. Previous research as a Working Group Leader of the Stress Ecology and Sediment Toxicology Group at RWTH Aachen University (Germany) included understanding the fate, bioavailability, and toxicity of contaminants associated with sediments, including mobilization of contaminants from flood events. Research includes innovative and classical sediment toxicological techniques investigating inorganic substances, organic substances and other pollutants of increasing importance, using exposure scenarios and effect-based tools (biomarkers and bioassays with vertebrates and invertebrates). Dr. Crawford completed her PhD (Environmental Toxicology, University of Saskatchewan) in 2016 and her BSc. (Environmental Biology, University of Guelph) in 2009.

