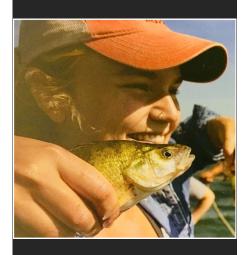# Environmental Science Graduate Program Student Seminar Series

Haley Kujawa doing research at Stone Laboratory

Haley Kujawa

Cunz 330 | 10 - 26 -18 | 3:00 pm - 4:00 pm

The role of water management and climate change uncertainty: a case study in the Maumee River Watershed

Planning resilient water management in the face of climate change is a problem everywhere. A common approach of incorporating climate change analysis into watershed management consists of using a single hydrological model driven by temperature and precipitation data from an ensemble of general circulation models (GCMs). While this method may capture the range of future climate predictions, it does not account for bias introduced from the hydrological model. This study highlights the uncertainties associated with independently set-up hydrological models used in climate change analysis. This work was done on the Maumee River Watershed, which is a priority for reducing Lake Erie's harmful algal blooms. Five Soil and Water Assessment Tool (SWAT) configurations for the Maumee watershed were set-up and calibrated by independent research groups who were allowed freedom to retain differences in model structure, inputs, management, and parameterizations. All models performed well when compared with observational data of discharge and nutrient loads. We then drove these SWAT models with daily temperature and precipitation predictions from an ensemble of six GCMs. The results suggest that the models generally agree on changes in discharge, and yet future water quality shows a large range of uncertainty and cannot be fully explained by the changes in precipitation and discharge. While numerous studies have used a single SWAT model with an ensemble of GCMs for future water quality prediction, this study highlights the importance of uncertainty derived from the SWAT model.