

## *Division of Plant and Soil Sciences Seminar*

**Thursday January 25, 4 p.m.  
Room 4004, Agricultural Sciences Building**

# **Elliott Kellner**

**Research Assistant Professor, Institute of Water Security  
and Science, West Virginia University**

## *“The Long-Term Impacts of Forest Removal on Floodplain Subsurface Hydrology”*

A study was implemented in fall 2010, in the Hinkson Creek Watershed, Missouri, USA, to improve quantitative understanding of the long-term impact of forest removal on floodplain hydrology. Automated volumetric water content (VWC) probes and piezometers equipped with pressure transducers to monitor shallow groundwater (SGW) temperature and level were installed in a gridded study design within a historic agricultural field (Ag) and a remnant bottomland hardwood forest (BHF). Groundwater was analyzed for 49 physiochemical metrics. Results showed VWC to be significantly different between sites ( $p < 0.01$ ) during the study, with site averages of 33.1 and 32.8% at the Ag and BHF sites, respectively. Semi-variogram analyses results suggest historic forest removal and cultivation of the Ag site facilitated the development of strong VWC spatial dependency. SGW temperature range at the Ag site was 72% greater than at the BHF site. BHF groundwater contained significantly ( $p < 0.05$ ) higher concentrations of nutrients, while Ag groundwater was characterized by significantly ( $p < 0.05$ ) higher concentrations of trace elements. Collective results highlight the greater extent to which BHF vegetation impacts subsurface hydrology, relative to grassland/agricultural systems, and point to the value of reestablishing floodplain forests for freshwater routing, water quality, aquatic ecosystem conservation, and flood mitigation in mixed-land-use watersheds.

Contact: [nikola.kovinich@mail.wvu.edu](mailto:nikola.kovinich@mail.wvu.edu) or [michael.gutensohn@mail.wvu.edu](mailto:michael.gutensohn@mail.wvu.edu)