Dr. G. Matt Davies, an Assistant Professor in Soil and Plant Community Restoration in the School of Environment and Natural Resources at Ohio State and Dr. Gil Bohrer, completed an Ohio WRC 104(b) funded project titled **"Bog HELPR: Bog History, Ecosystem status and Land-use for Peatland Restoration in Ohio"**. The goal of the project was to collate data on the spatial distribution of peat bogs in Ohio and combine this data with a ground survey to assess the bogs' ecological condition, information that might be used for potential restoration. The research is based on the increasing recognition that restoration of wetland ecosystems can play an important role in mitigating the effects of diffuse agricultural pollution in watersheds and increasing catchment resilience in the face of climate change. There can, however, be significant trade-offs inherent in restoration, not least the potential impacts on greenhouse gas emissions.

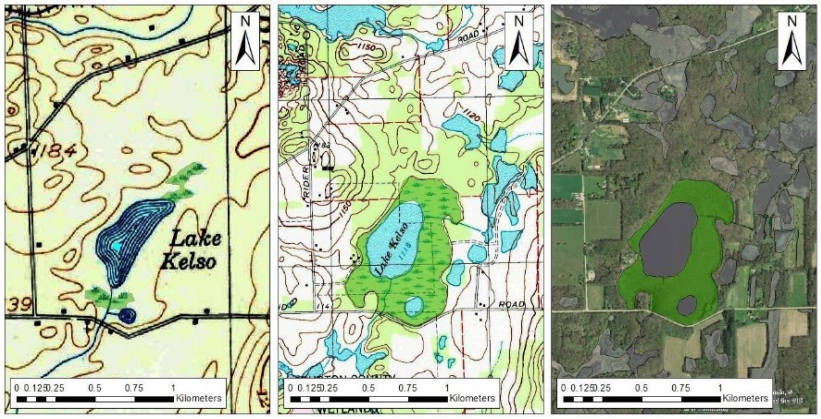

Figure 1: From left to right the pictures show a 1900's era USGS Topo Map, a 1994 Topo Map and an aerial image from 2009. Areas mapped as peat bog are shown in green.

The research evaluated four methods to determine their usefulness in peatland restoration in Ohio: using historical maps for classification, peatbog hydro-chemistry, vegetation community composition, and soil microbial community composition. The research team evaluated a total of 70 potential bog sites (Figure 1), and developed bog classification maps. These maps will provide an invaluable resource that catalogues areas where peatland cover has been lost and that should be a priority for ground survey to assess restoration potential. From hydrochemical analyses, it was determined that Ohio's peat bogs can most likely be identified as poor fen systems. This conclusion was supported by the high electrical conductivity with a wide range (33-597 µs/cm; median = 70 µs/cm). Additionally, carbon stock estimates confirm that, regardless of their small size and total area, Ohio's peat bogs are a critical store of ancient carbon (See Figure 2). In assessing the vegetative and microbial communities within the peat bogs, the research showed there bryophytes (non-vascular plants) are useful as indicators of peatland hydrochemical status. This discovery will be important for rapidly monitoring sites where knowledge on varying water table and water quality conditions is not available.

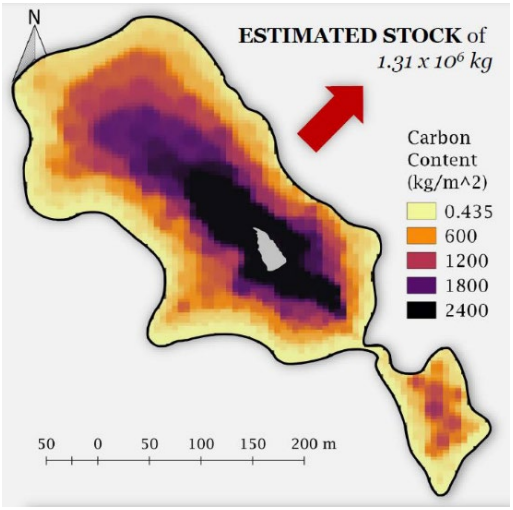

Figure 2: Distribution of peat carbon stocks across Flatiron Bog, Portage County, OH. Organic soil depths at the center of the bog were >10 meters.

Researcher Profile: Dr. G. Matt Davies completed his post-doctoral research at the University of Washington in Seattle and a lectureship at the University of Glasgow in Scotland. His research focuses on the management and restoration of peatland ecosystems and has included studies on the effects of grazing and wildfires on the release of carbon from temperate peatlands.