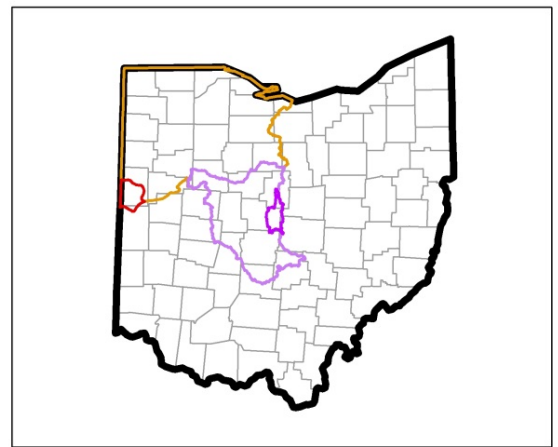
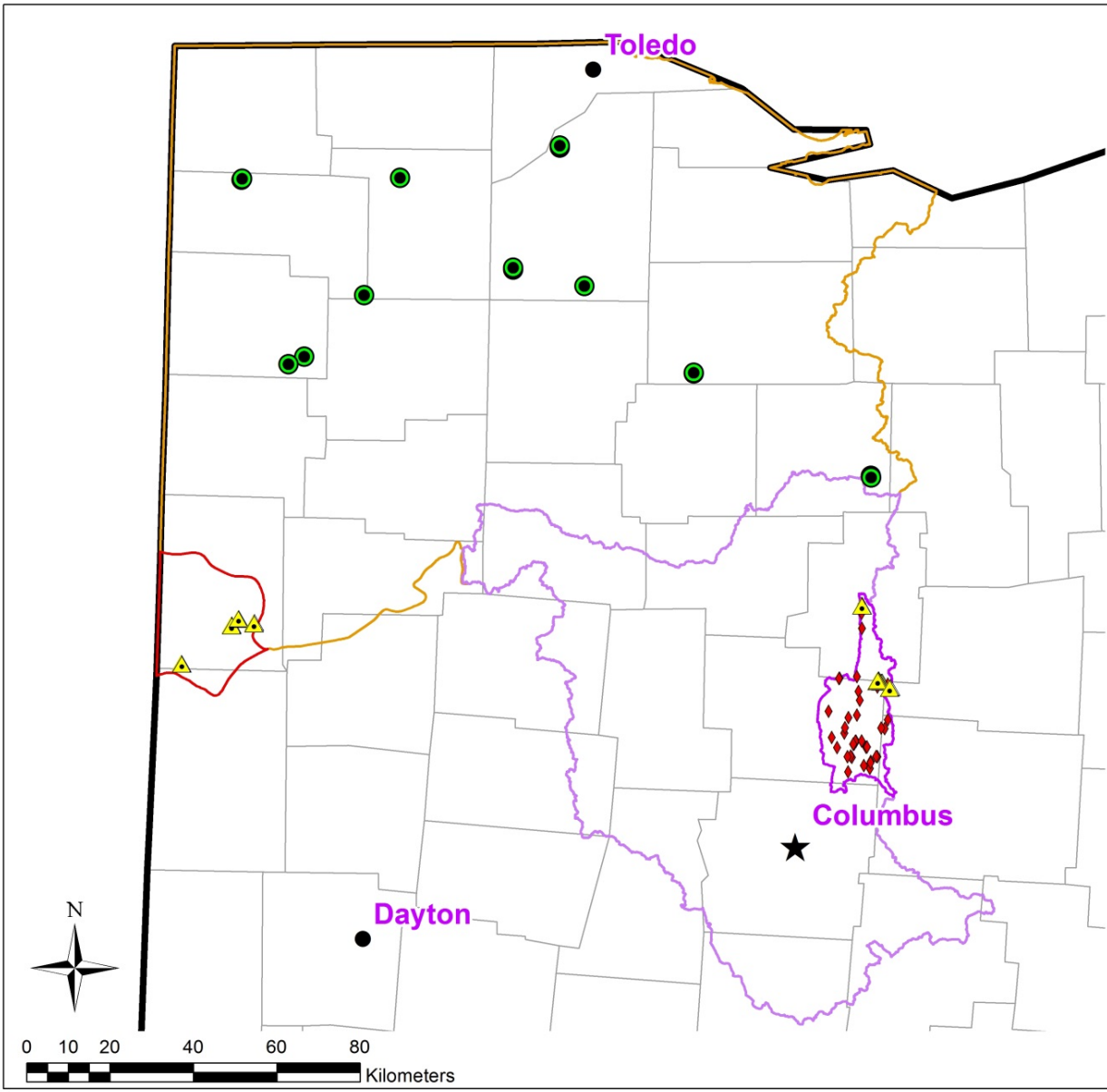


# SDRU - Columbus, OH

## CEAP Watershed & EOF Sites

### Legend

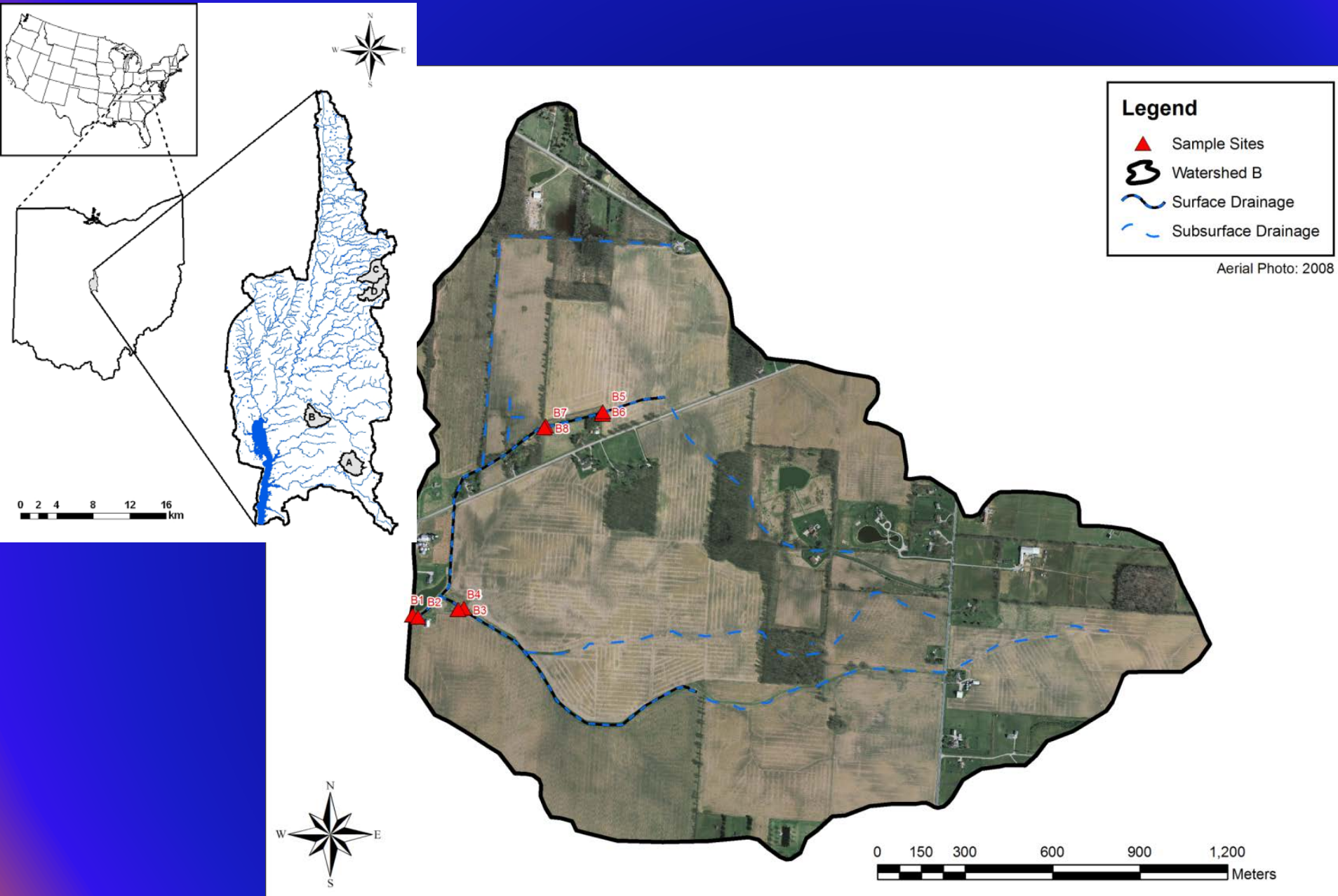
- CIG EOF
- ▲ MRBI
- ◆ CEAP
- Upper Big Walnut Creek Watershed
- Upper Scioto River Watershed
- Upper Wabash River Watershed (Ohio)
- Western Lake Erie Basin (Ohio)

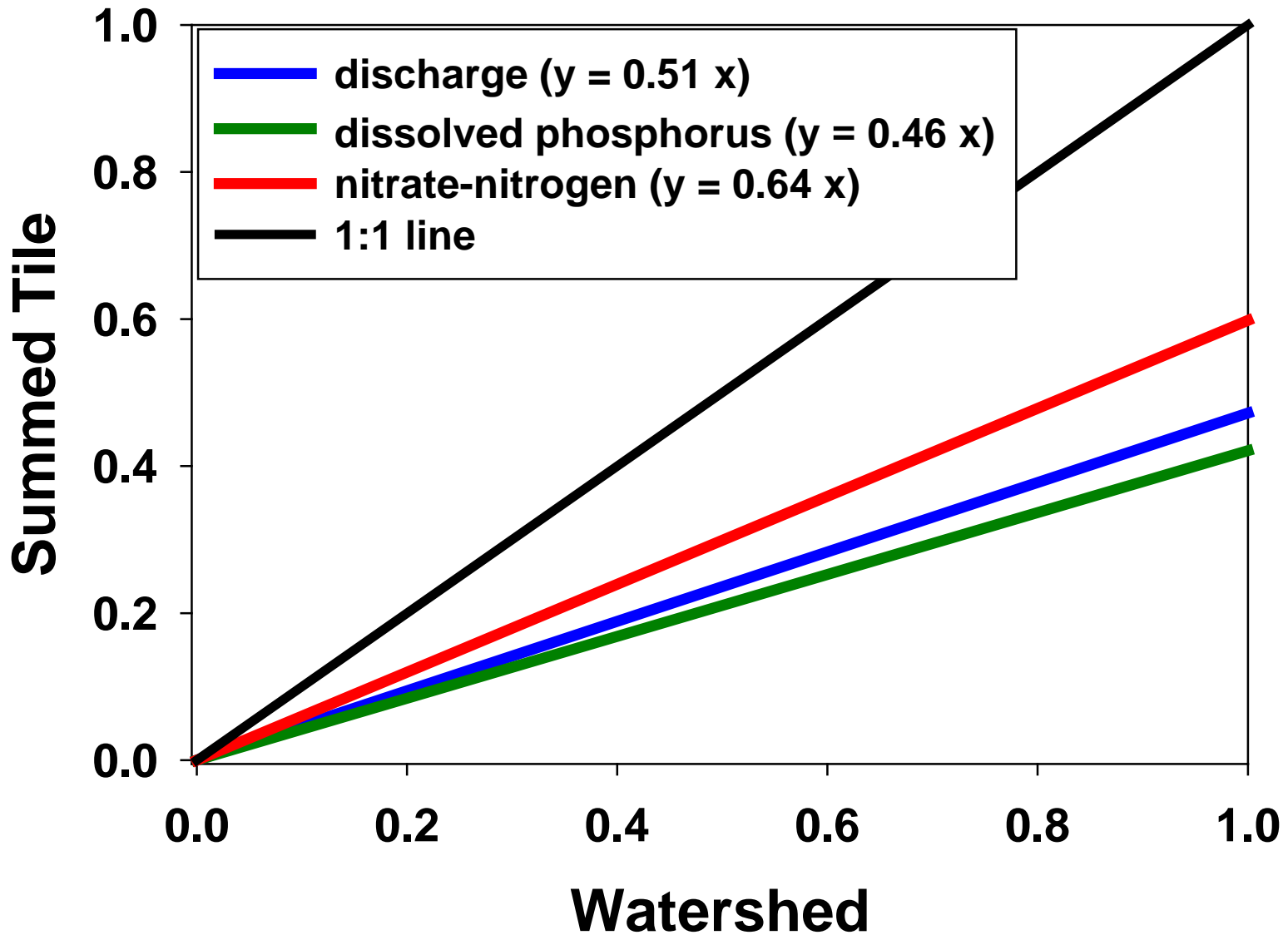


# Accomplishments

- **Quantified the watershed scale contribution of tile drainage to hydrology and nutrient transport.**
- **Established multiple paired edge-of-field (EOF) natural research laboratories in three high priority watersheds in Ohio.**
- **Documented need for agricultural conservation programs to adopt a greater focus on improving physical habitat quality within channelized agricultural headwater streams.**

# tile drainage contribution to watershed hydrology and wq





**2005-2010 UBWC watershed**

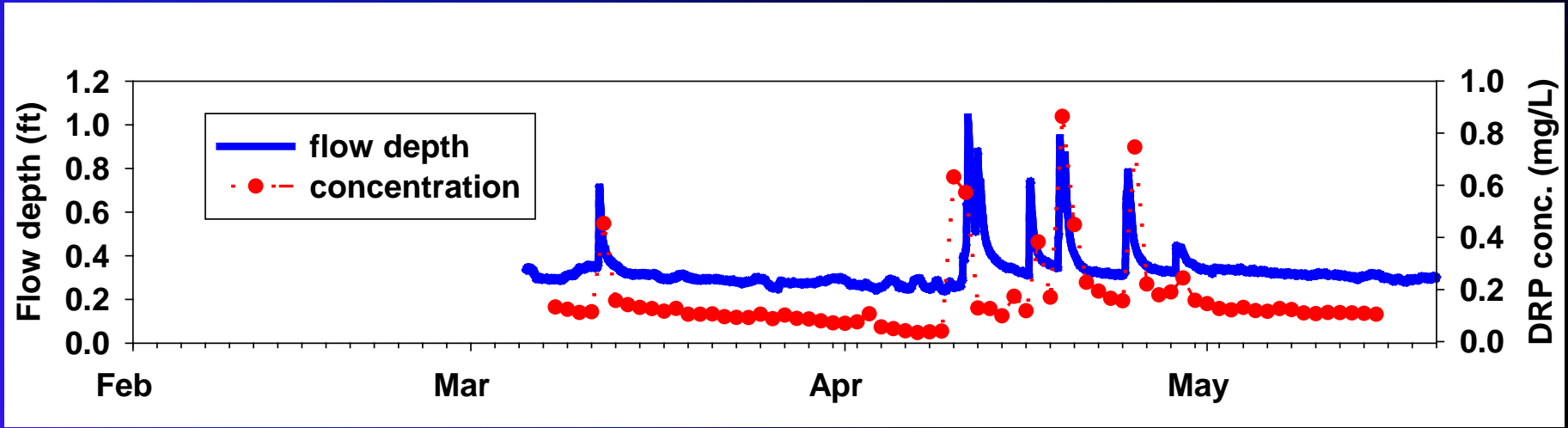
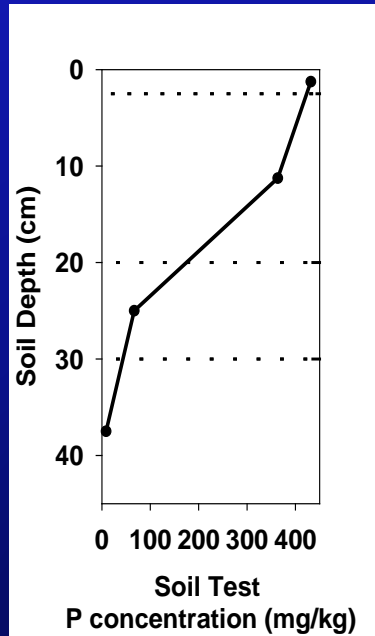
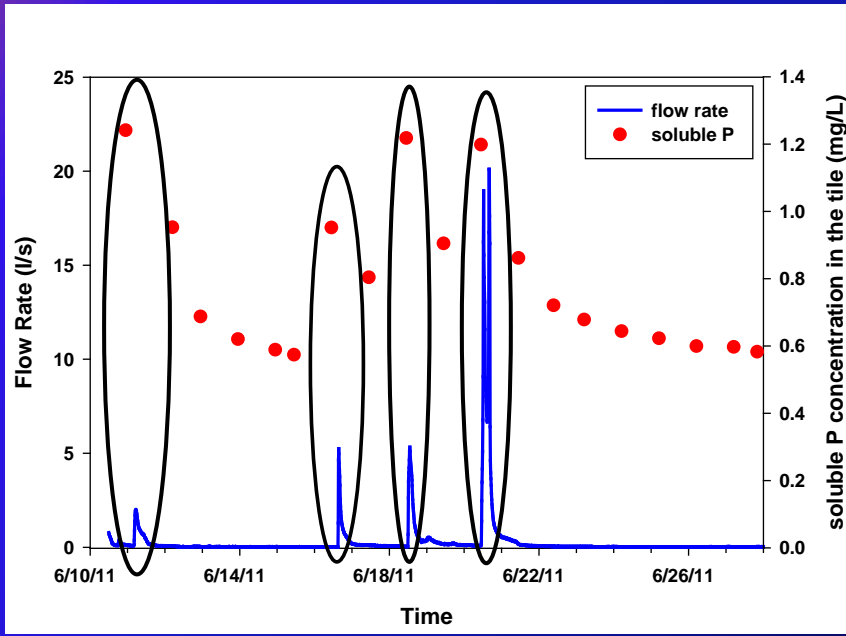
# edge-of-field (EOF) research sites

- **Before/After Control Impact Design**
  - **Minimum of one crop rotation per before and after period**
- **Target is 32 fields (16 pair) representative of Ohio crop production agriculture (8 pair in WLEB, 4 pair in Upper Wabash, 4 pair in Upper Scioto)**
  - **Currently: 24 fields (12 pairs) instrumented with remainder identified**
  - **Surface and subsurface combination when possible**
- **Cover crops was initial focus for MRBI**





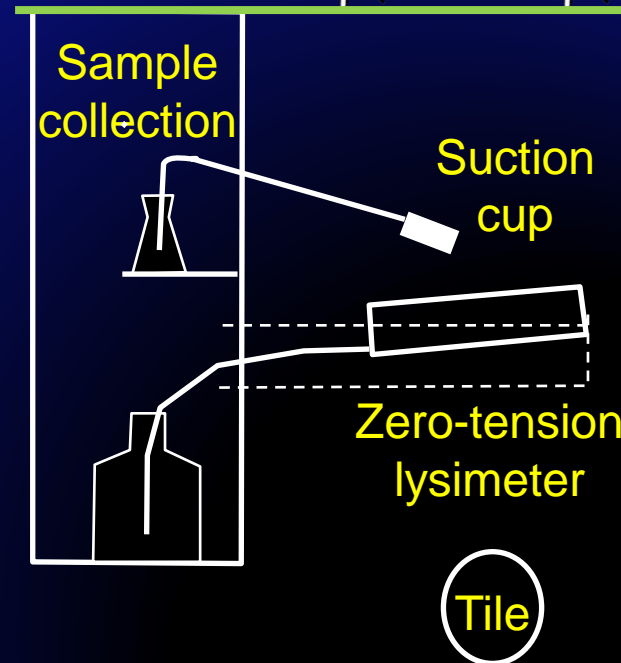
# edge-of-field (EOF) research sites



**Evidence of preferential flow**



# Quantifying hydrology and nutrient transport in matrix and preferential flow paths



Separate storm hydrographs into components using end-member mixing models to determine preferential flow

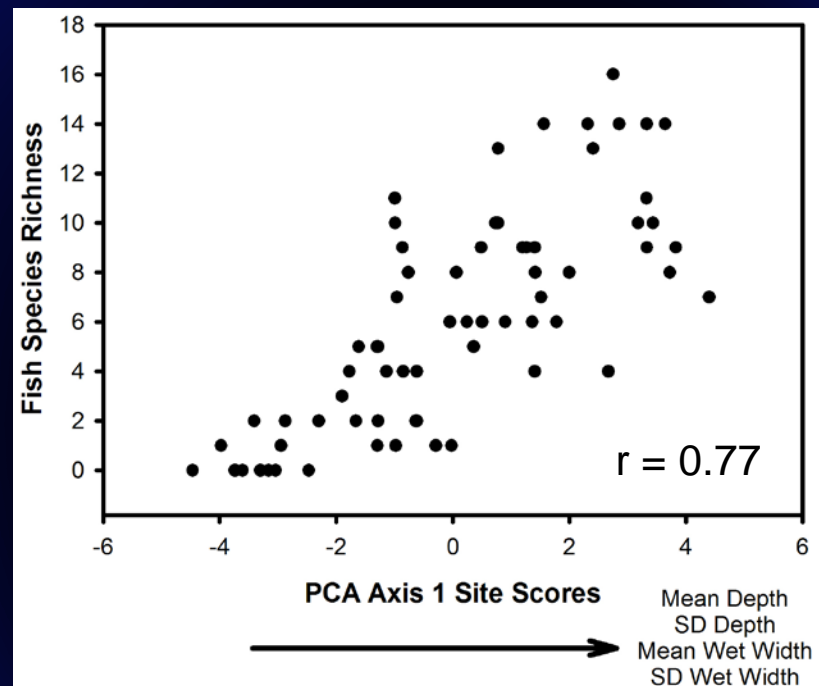
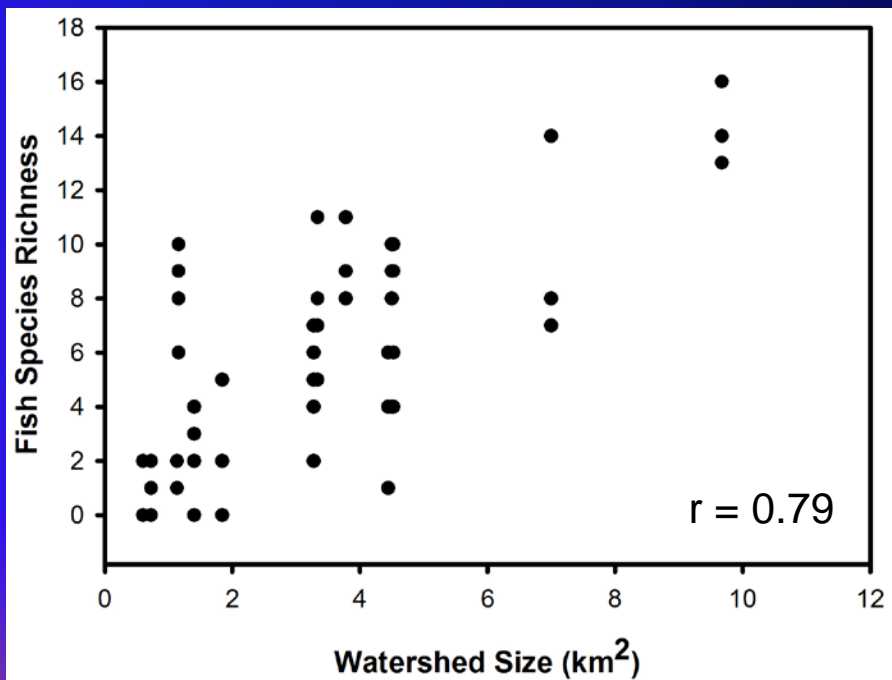
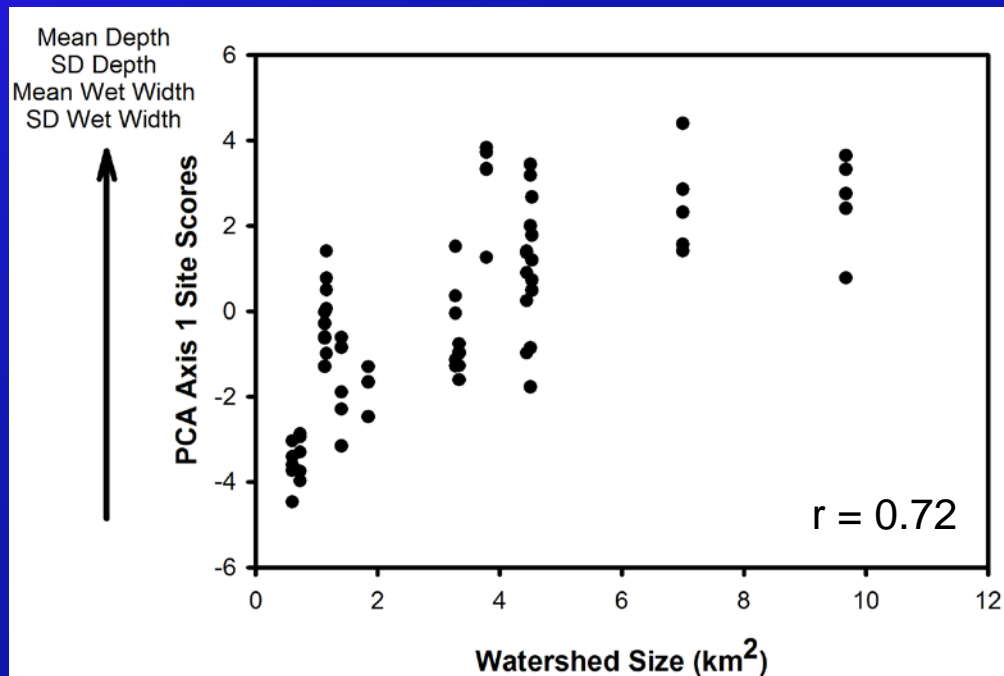


# Focus on improving physical habitat quality

## Cross-watershed comparisons of fish-habitat relationships in CEAP watersheds in Indiana and Ohio (2006 to 2010)

- Do fish-habitat relationships differ between Cedar Creek and Upper Big Walnut Creek watersheds?
- Does watershed size influence fish-habitat relationships?





# Focus on improving physical habitat quality

## Fish Community Assessments

- Fishes most strongly correlated with instream habitat compared to riparian habitat and water chemistry in both CC and UBWC
- Influence of watershed size similar to instream habitat
- Changes in hydrology and substrate appear to be the mechanism by which watershed size influences fish community structure



# Focus on improving physical habitat quality

## Management Implications

- **Results provide predictions on types of practices most effective in restoring fish biodiversity in Midwest channelized agricultural headwater streams**
  - **Most effective practices will be those that lead to improvements in instream habitat quality**
  - **Practices that reduce nutrient and pesticide loading without altering physical habitat not likely to improve fish biodiversity**



# Other Activities/Challenges

- **Joint LTAR submission (NSERL and Heidelberg University)**
- **Recruitment (post-doc – modeling)**
- **STEWARDS**
- **Losing access and data acquisition on privately owned lands**

# How we get it all done!!

**Permanent technicians – Phil Levison (field), Eric Fischer (lab) and Kathryn Lock (ecology)**

**Term technicians – Liz McKinley (field), Jed Stinner (field), Brad Gerten (field)**

**Two students – Katy Remora (field/lab) and Katy Sheban (lab)**

