THE OHIO STATE UNIVERSITY

COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

Global Water Initiative

Data Analysis & Integration to Improve Water Quality in Agricultural Landscapes

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University of Florida 12/8/15


FedEx

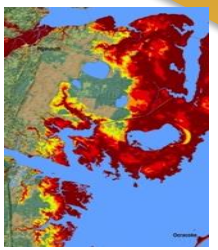

National Geographic 2

Using innovative approaches to address three global water challenges.

Global Water Initiative

Wells to Wellness
Rural Water Supply

Field to Faucet
Harmful Algal Blooms



Coastal Resiliency
Disaster preparedness/prevention

Using innovative approaches to address three global water challenges.

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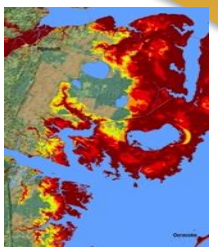
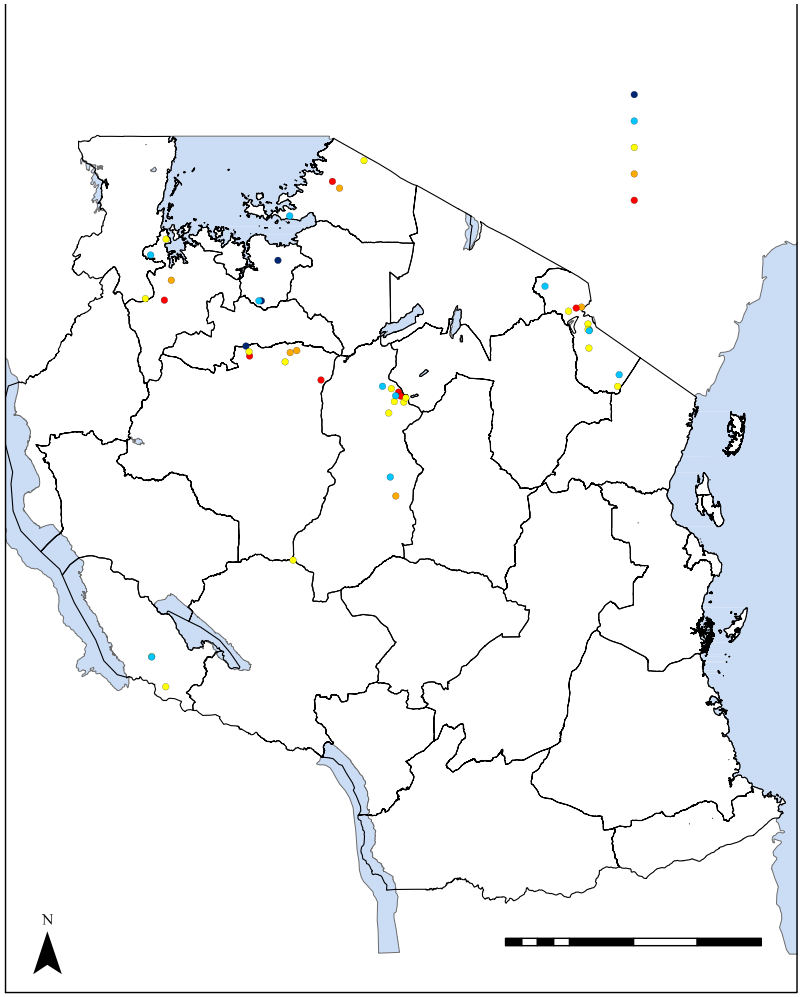


Coastal Resiliency
Disaster preparedness/prevention

Tanzania Drinking Water Wells



- ~5,000 nonfunctional wells
- 45 well pilot program
- Expand to remaining wells
- Water + Power + Econ. Dev.

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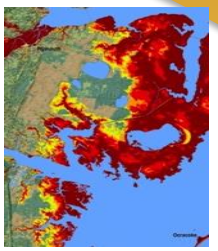

Coastal Resiliency
Disaster preparedness/prevention

Coastal Resilience: Developing Global Relationships

- Leadership Team for UNESCO Coastal Resilience Collaborative.
  - Other university partners include MIT, Stanford, LSU and other key government and university partners from around the world.

- Also invited to be on the UN R!SE team (sea level rise) with key government, industry and university partners
  - In process of framing an initial set of candidate projects for R!SE

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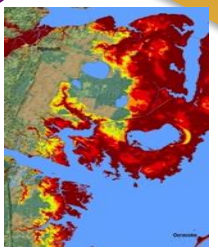
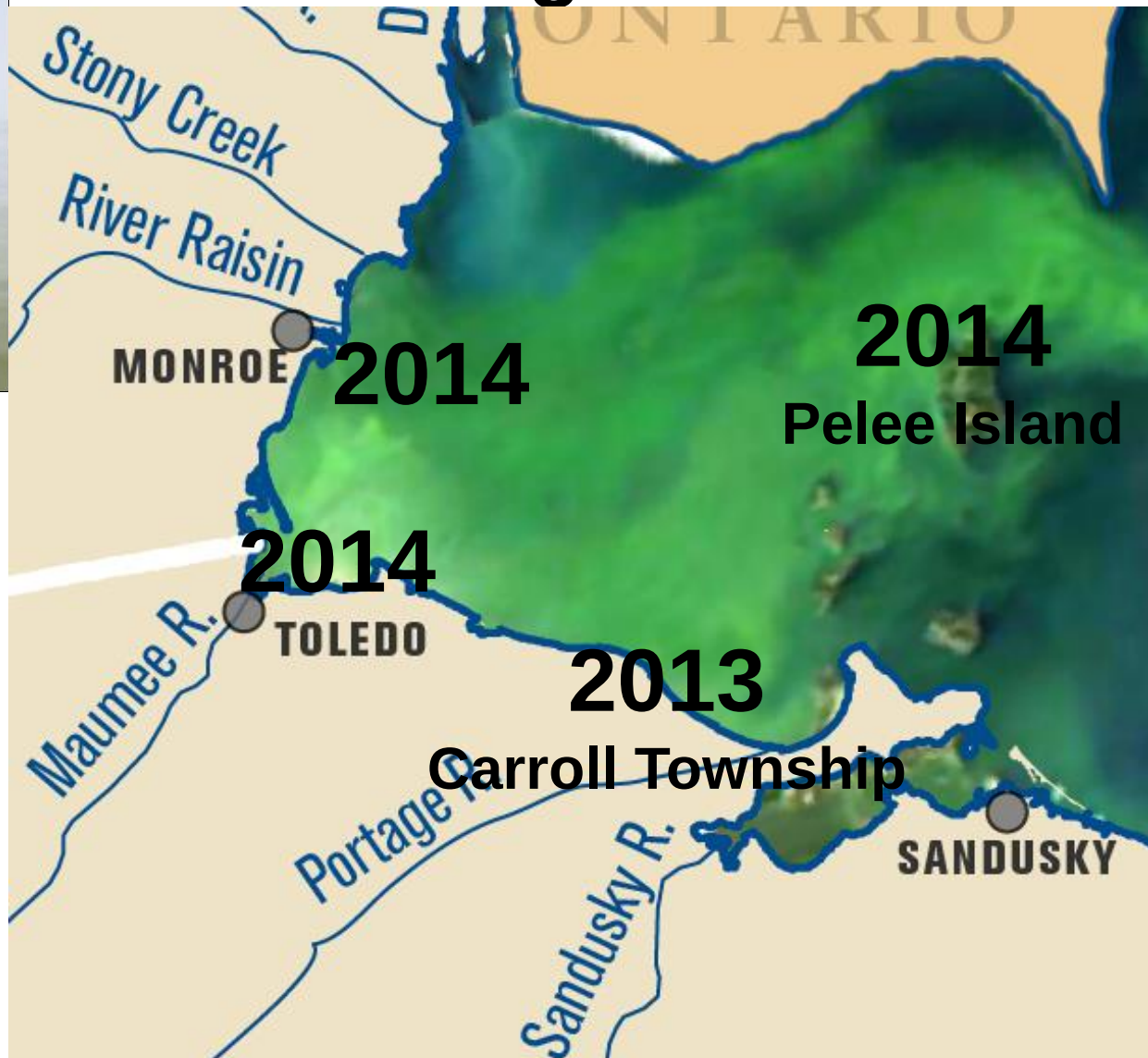
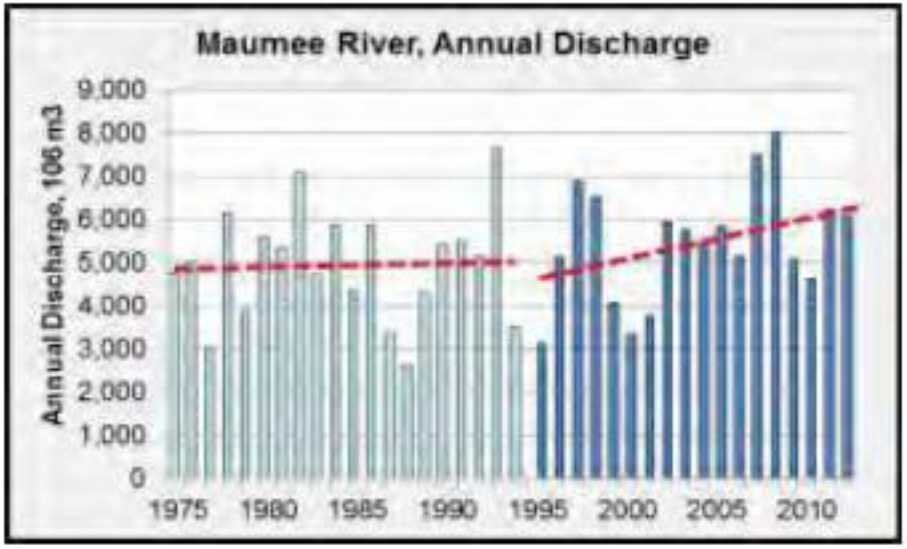


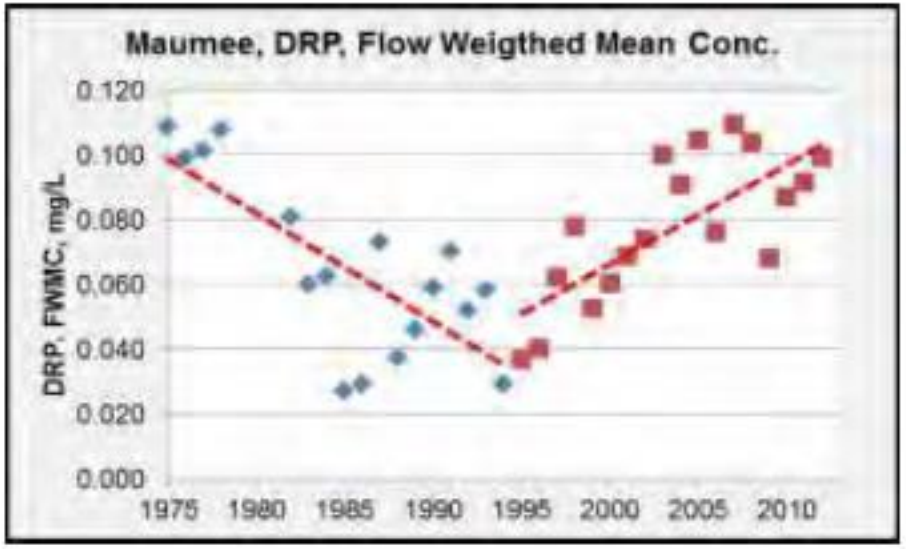
Coastal Resiliency
Disaster preparedness/prevention

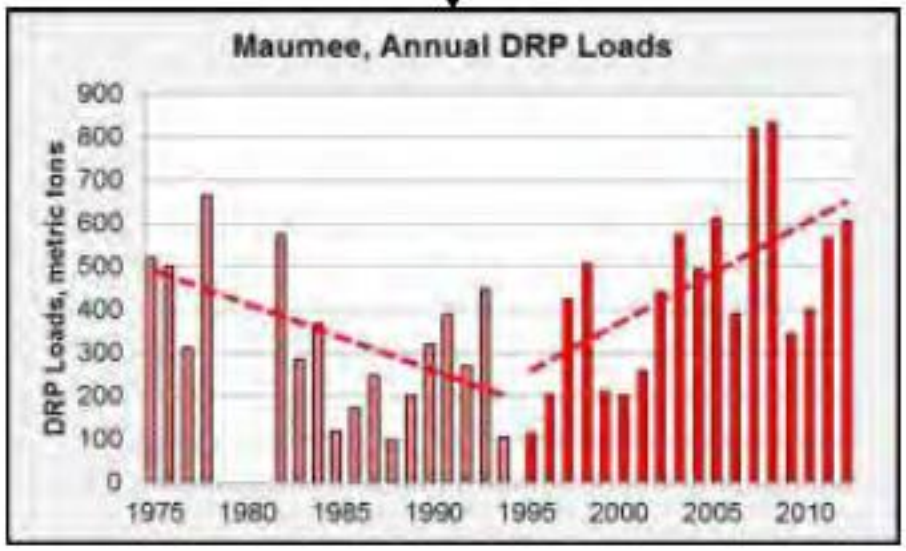
Columbus Dispatch 2014

Drinking Water Bans









Why Focus on Dissolved Phosphorus ?

Lake Erie P Task Force Report II 2013

Figure 3-8. Annual discharges and flow-weighted mean concentrations and loads of DRP (Discharge data from USGS Streamgage Maumee River at Waterville (04193500) and graphed by Heidelberg University, NCWQR)

Focus on Dissolved Phosphorus…

Reduction Recommendations:

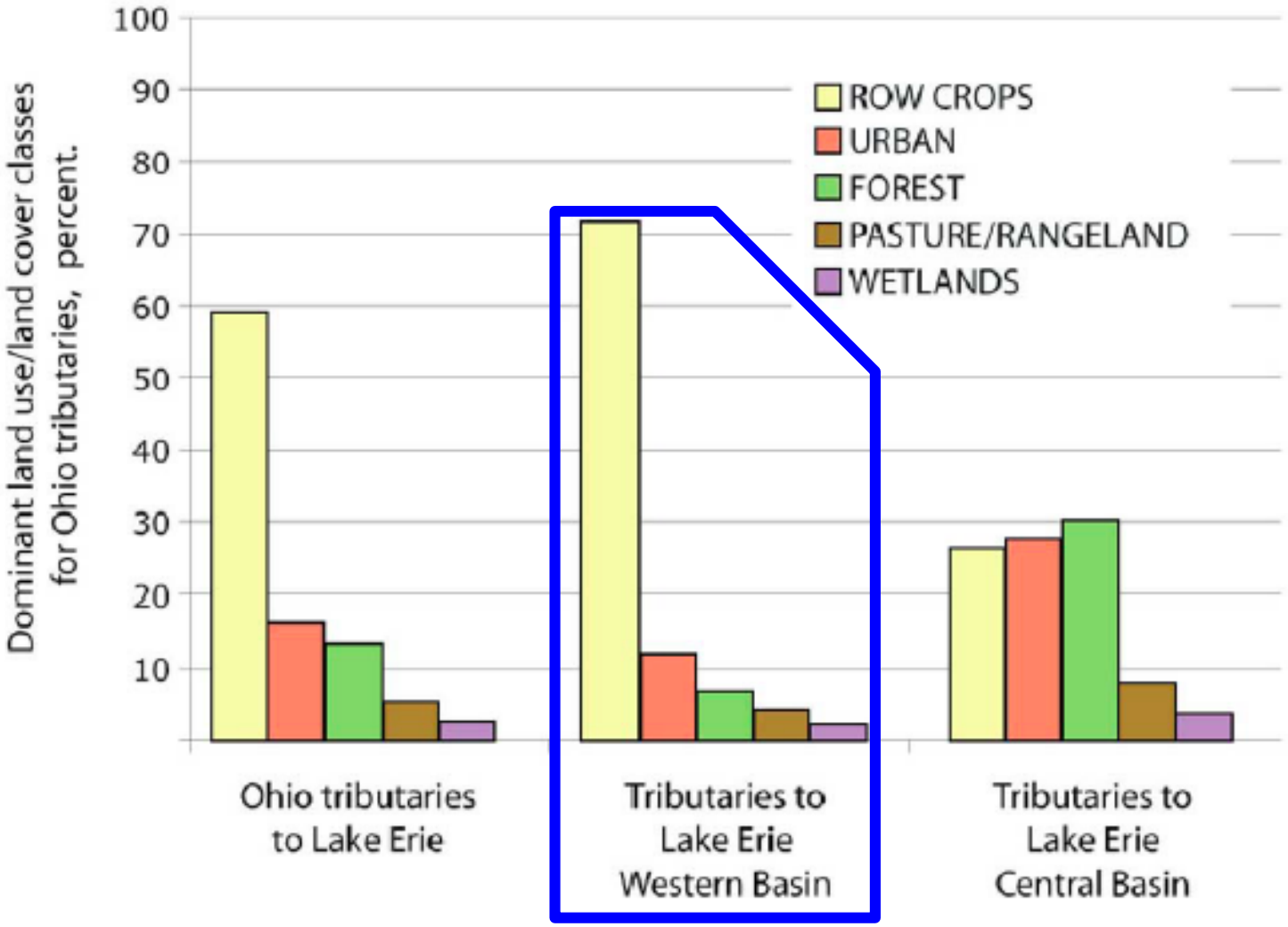
Spring Total Phosphorus: 37% (1275→800MT)

Annual Total Phosphorus: 39% (2630→1600MT)

Spring Dissolved Phosphorus: 41% (256→150MT)

Lake Erie P Task Force Report II 2013

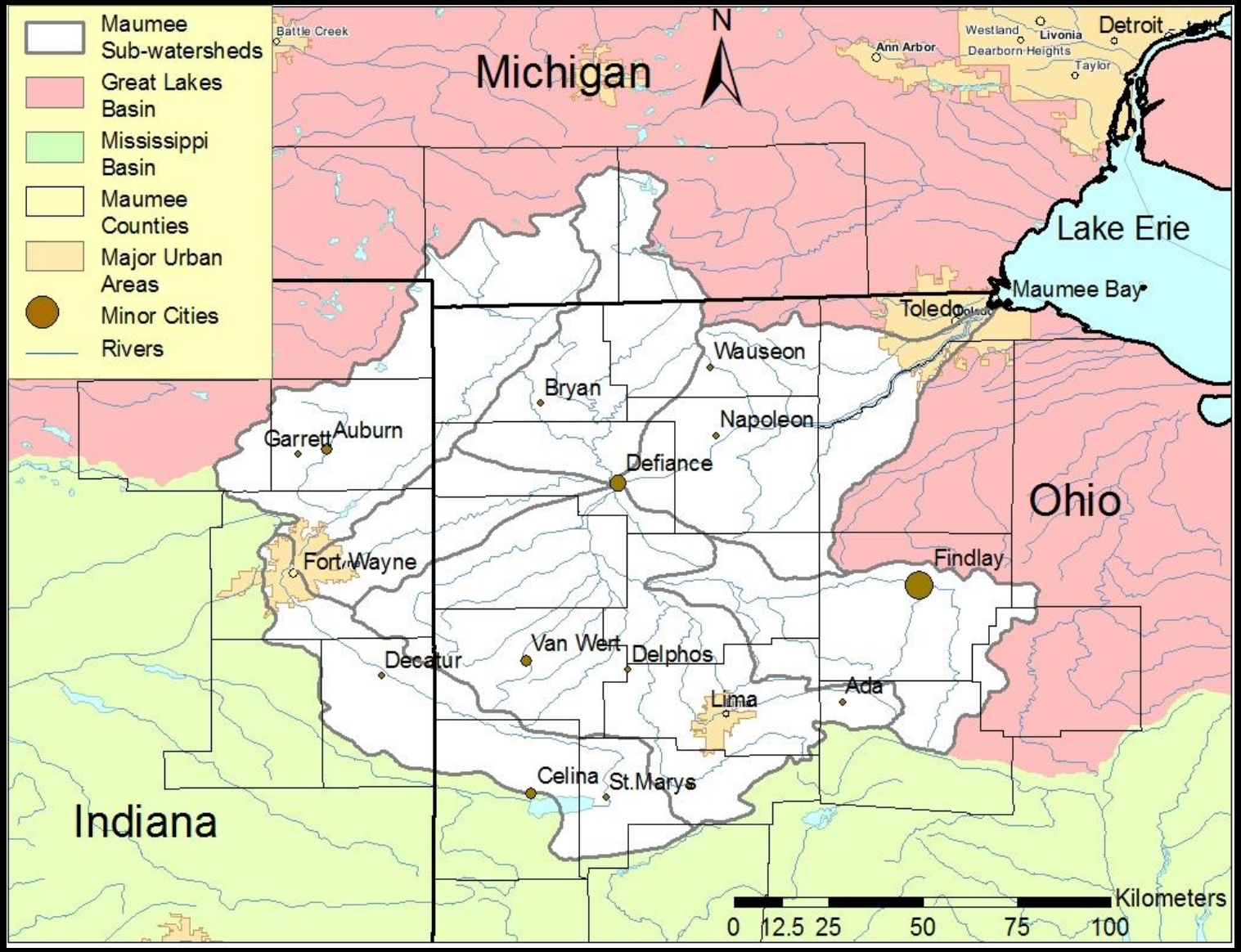
Focus on Agricultural runoff…



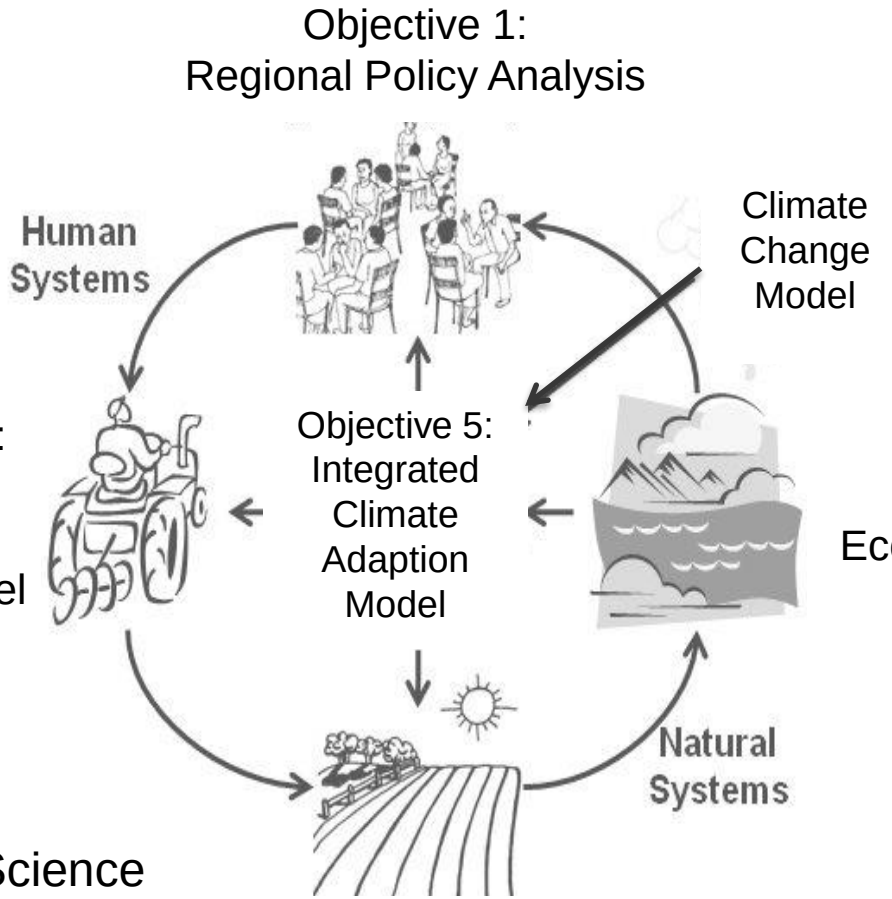
OH P task force 2010

Maumee Watershed

Largest in Great Lakes~17,000km^2, 85% agriculture



Maumee Watershed Project



Funded by: National Science Foundation, Coupled Human and Natural Systems Program: $1.5M

Social Science Data

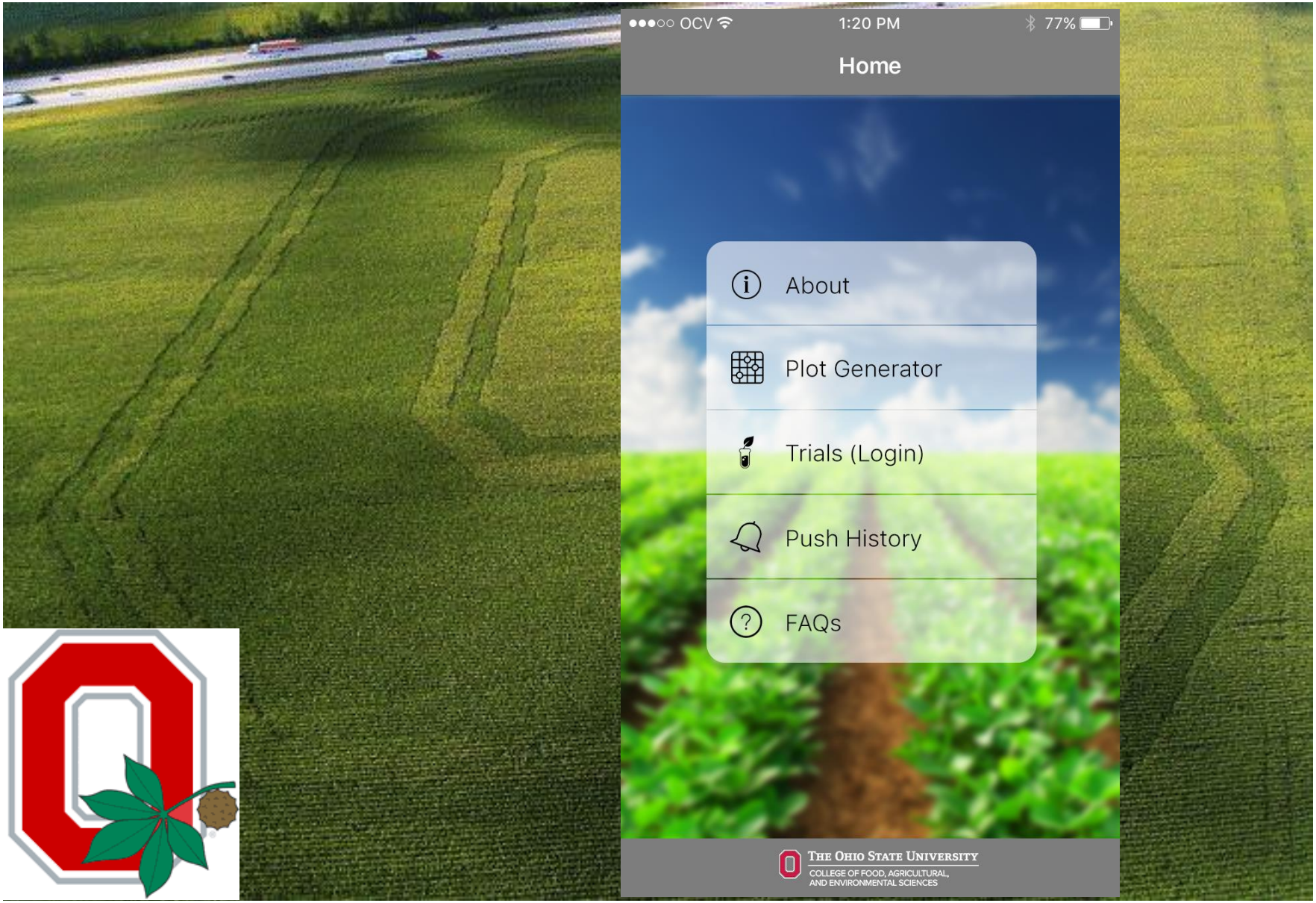
Best Management Practices (BMPs)	Probability of Adoption, in Percent			
	Will Never	Unlikely	Likely	Will Definitely
Planting cover crops after fall harvest	6	46	43	5
Delaying broadcasting when the forecast predicts a 50% or more chance of at least 1 inch of total rainfall in the next 12 hours	3	22	54	21
Managing field water levels with drainage management systems	10	48	34	8
Avoiding winter or frozen ground surface application of phosphorus	6	13	40	41
Placement of fertilizer at least 2-3 inches below the soil surface	4	33	49	14
Following soil test trends to maintain the agronomic range for phosphorus in the soil (15-30 ppm)	3	13	56	28

- Farmer Characteristics
- Contextual Data
- Predictive Models

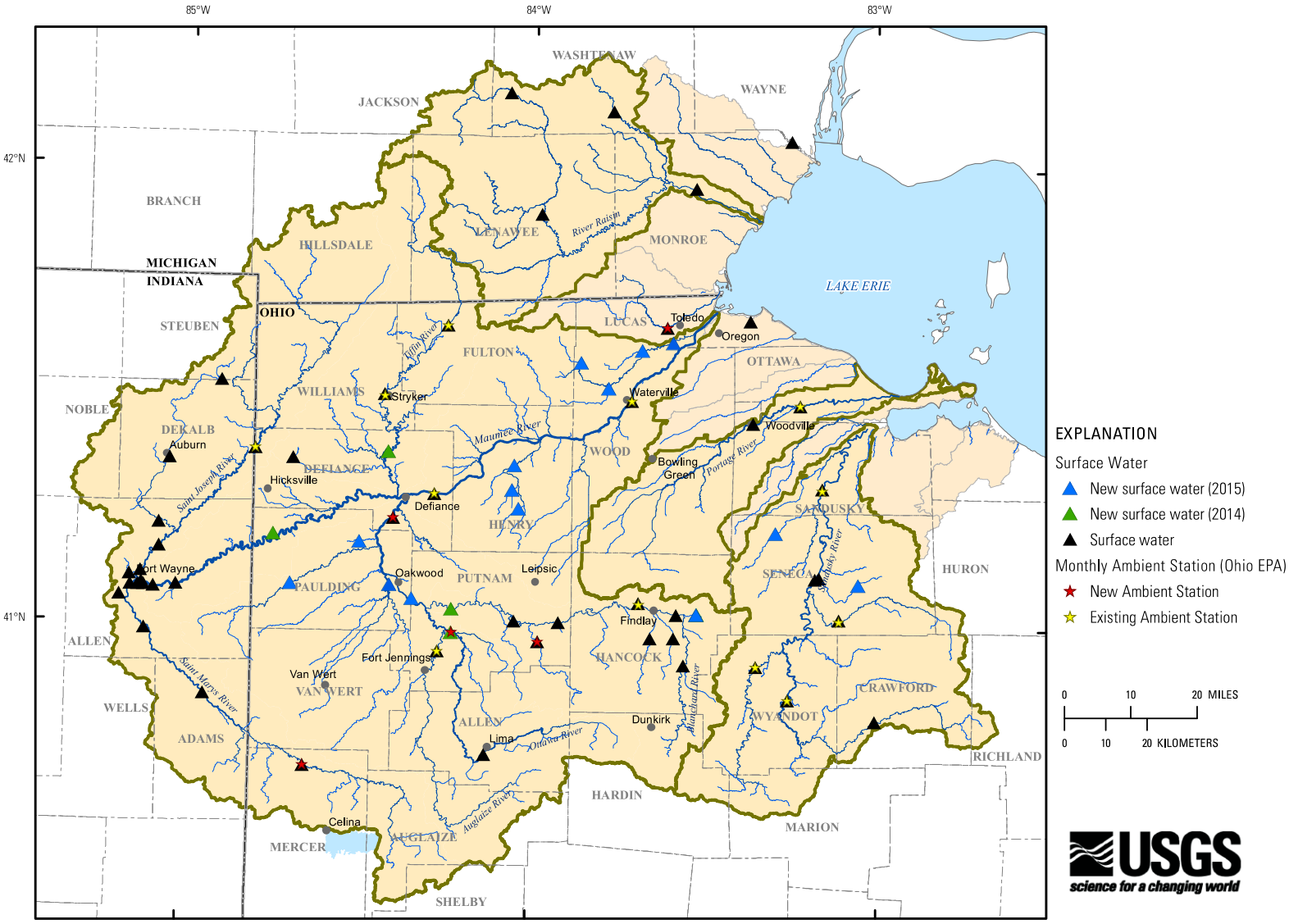
Topsoil and nutrient runoff during storm events

Manure and livestock bedding applied to frozen field

Precision Agriculture & Data

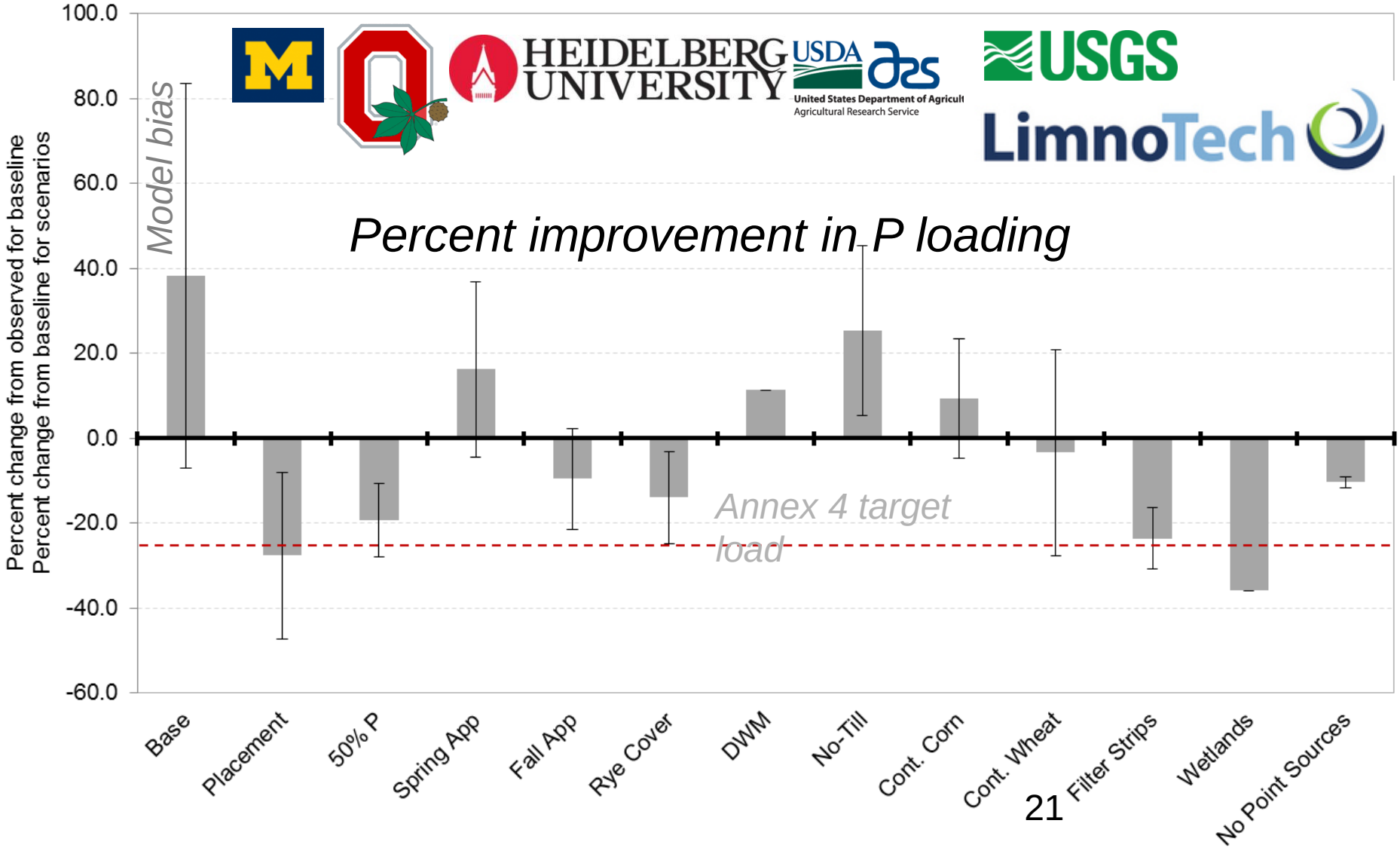


Watershed Modeling & Data



Water Quality Stations and Stream Gages in Western Lake Erie Basin, February 2015

Multi watershed model analysis



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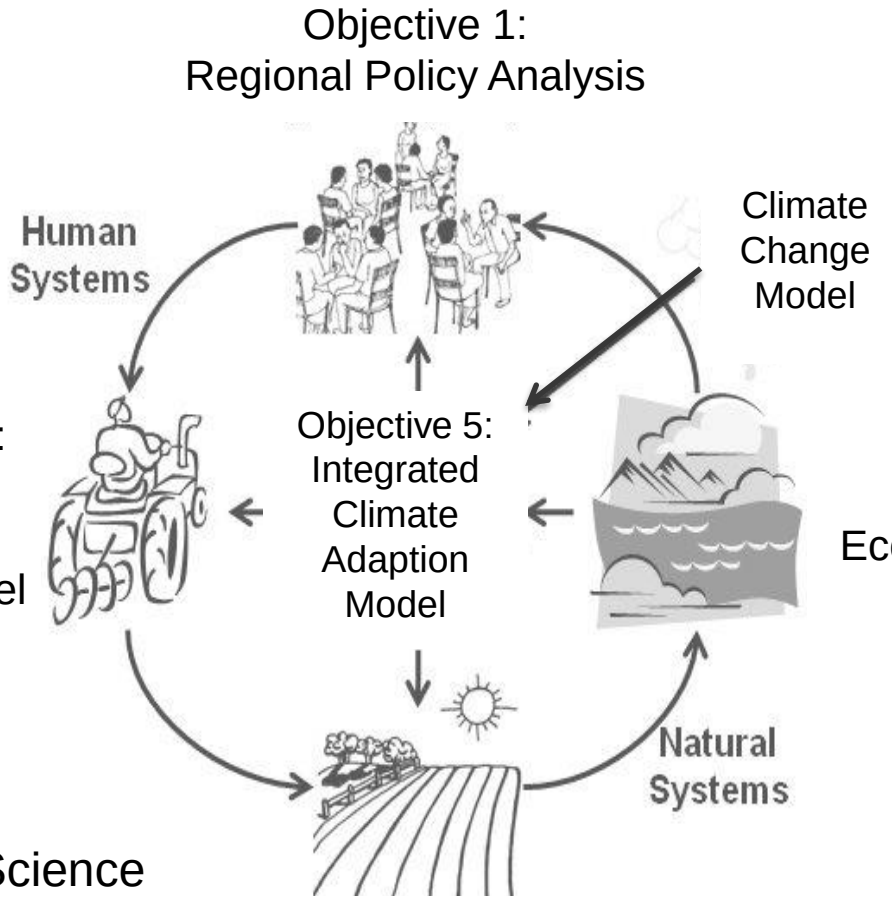

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