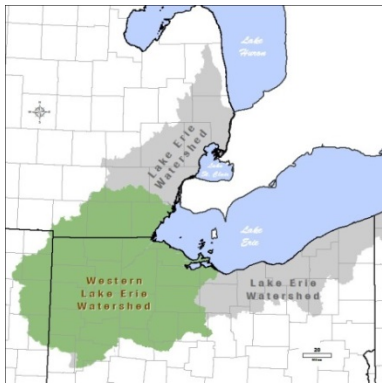


Evaluating the 4R Concept & Certification Program in the Western Lake Erie Basin (WLEB)



Rationale:

- Increasing extent and severity of HABs in WLEB → linked to dissolved P inputs
- Greater water treatment costs, reductions in fish populations, and poor water quality that has negatively impacted drinking water supplies, fishing, and tourism industries within the Great Lakes region
- Educational programs directed at growers and nutrient service providers emphasize principles of the 4Rs (Right Source, Rate, Time, and Placement of fertilizer) and the 4R Nutrient Stewardship Certification program

Goal: Evaluate the specific impacts of the adoption of practices associated with the 4Rs, and the impact of the 4R Nutrient Stewardship Certification Program

Objective: Monitoring of 4R Impacts

Approach: Edge-of-field (EOF) and watershed assessments and stream metabolism response

Progress & Findings:

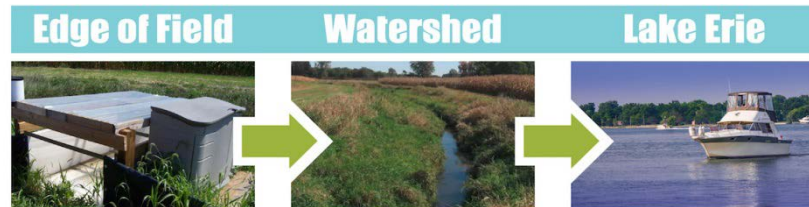
- ✓ Multiple paired EOF sites identified and instrumented
- ✓ 30+ years of tributary data available
- ✓ Preliminary findings suggests 4R practices will reduce offsite transport of Phosphorus

Objective: Modeling of sustainable environmental benefits

Approach: Multi-scale (field, watershed, lake) modeling of different 4R implementation levels

Progress:

- ✓ Ongoing development for Maumee, Portage and Sandusky watersheds
- ✓ Continued development & calibration of WLEEM (Lake) model
- ✓ Development of baseline mgt. scenarios



Objective: Determining the socioeconomic impact

Approach: Grower and retailer surveys

Progress & Findings:

- ✓ Previous Maumee watershed survey completed
- ✓ New grower and retailer surveys in final development stages
- ✓ Significant potential for increased 4R adoption in Maumee watershed



Objective: Integration, education, and outreach

Approach: websites, newsletters, field days, conferences, etc.

Progress:

- ✓ Website (<http://4Rcertified.org/research/>) created
- ✓ Field days planned
- ✓ 4R research project and program discussed at meetings

Co-PI Institutions: USDA-ARS, NCWQR at Heidelberg University, The Ohio State University, LimnoTech, The Nature Conservancy, and International Plant Nutrition Institute

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