Water Data to Answer Urgent Water Policy Questions:

Harmful Algal Blooms, Agriculture, and Lake Erie

Elin Betanzo

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National Monitoring Conference

NORTHEAST-MIDWEST INSTITUTE

Water Data to Answer Urgent Water Policy Questions:

Monitoring design, available data, and filling data gaps for determining the effectiveness of agricultural management practices for reducing tributary nutrient loads to Lake Erie

The first in a series of three reports focused on water data needed to address water policy issues. Future reports will focus on shale gas development in the Susquehanna River Basin and an overview of existing water-quality data across the Northeast-Midwest region.

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USGS science for a changing world

Authors

Author	Organization
Elin A. Betanzo	Northeast-Midwest Institute
Anne F. Choquette	U.S. Geological Survey
Kenneth H. Reckhow	Professor Emeritus at Duke University
Laura Hayes	U.S. Geological Survey
Erik R. Hagen	Northeast-Midwest Institute
Denise M. Argue	U.S. Geological Survey
Allegra A. Cangelosi	Northeast-Midwest Institute

Technical Advisory Committee

Member	Organization
Rajesh Bejankiwarr	International Joint Commission
William Brown	Pennsylvania Department of Environmental Protection
Anne Choquette	U.S. Geological Survey
Gabrielle Ferguson	Ontario Ministry of Agriculture and Food and Ministry of Rural Affairs
R. Peter Richards	Heidelberg University
Dale Robertson	U.S. Geological Survey
Paul Stacey	Great Bay National Estuarine Research Reserve, New Hampshire
Mark Tomer	Agricultural Research Service, USDA
Elizabeth Toot-Levy	Northeast Ohio Regional Sewer District

Study design to answer "How effective are agricultural management practices at reducing nutrients from nonpoint sources at the watershed scale?"

Tributary Water Data

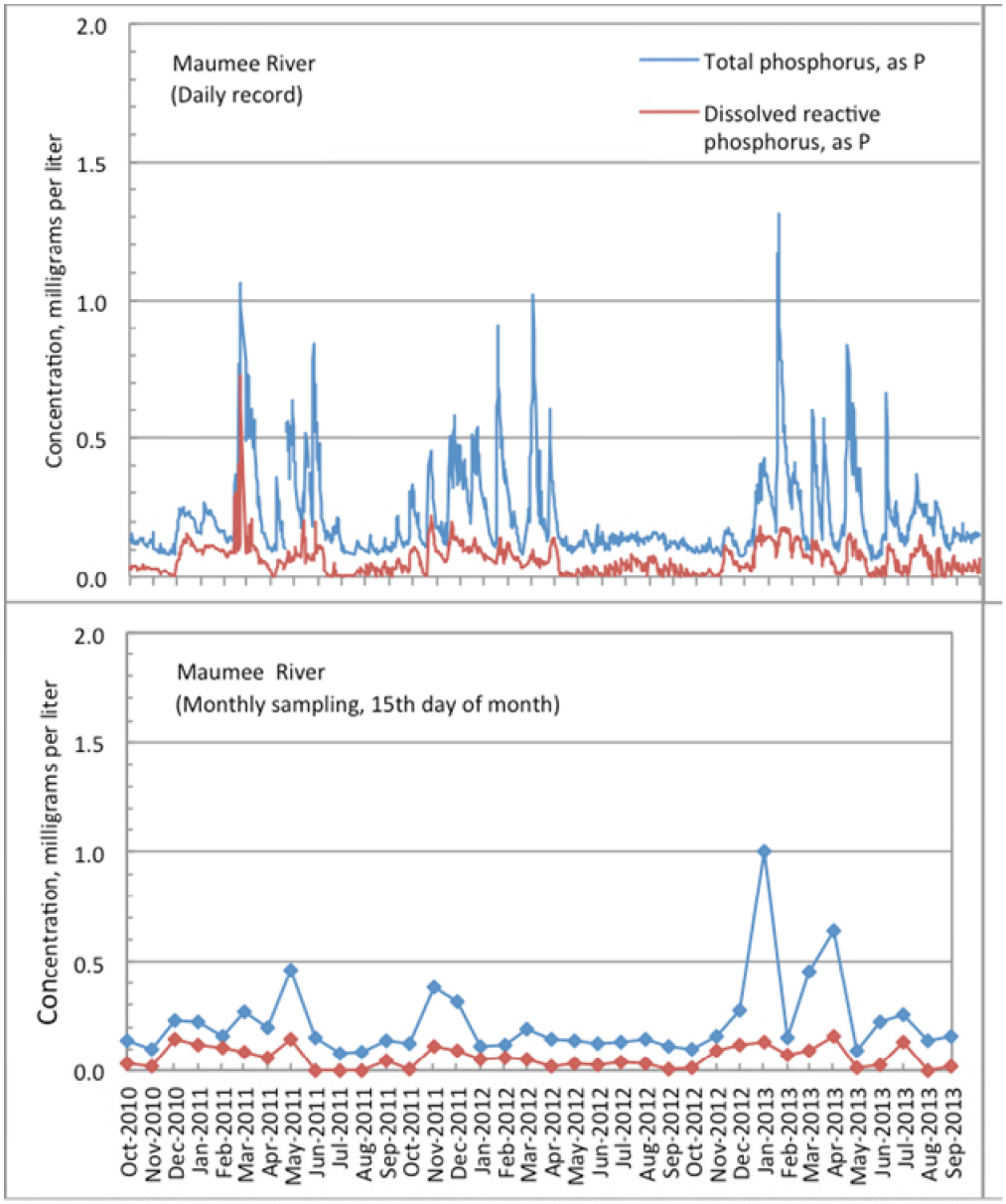
Appropriate Monitoring Sites

Supporting Data

The Right Tributary Water-Quality Data

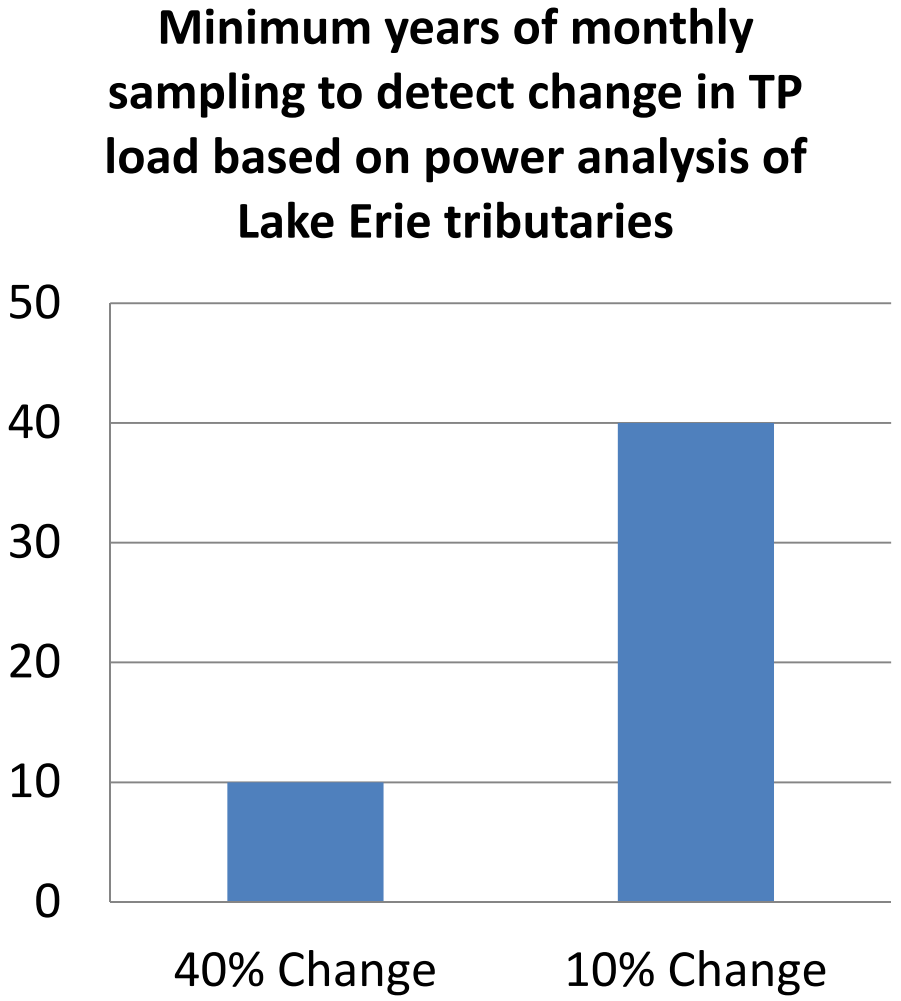
- Phosphorus and streamflow data
- Data for both small (<50 sq miles) and large (>1,000 sq miles) watershed scales
- Sampling frequency
- Duration of monitoring

The Right Sampling Frequency



- Sampling frequency must capture the full range of hydrological conditions within the watershed for accurate load estimates
- Minimum sampling = 12 monthly + 12 events per year

The Right Monitoring Duration



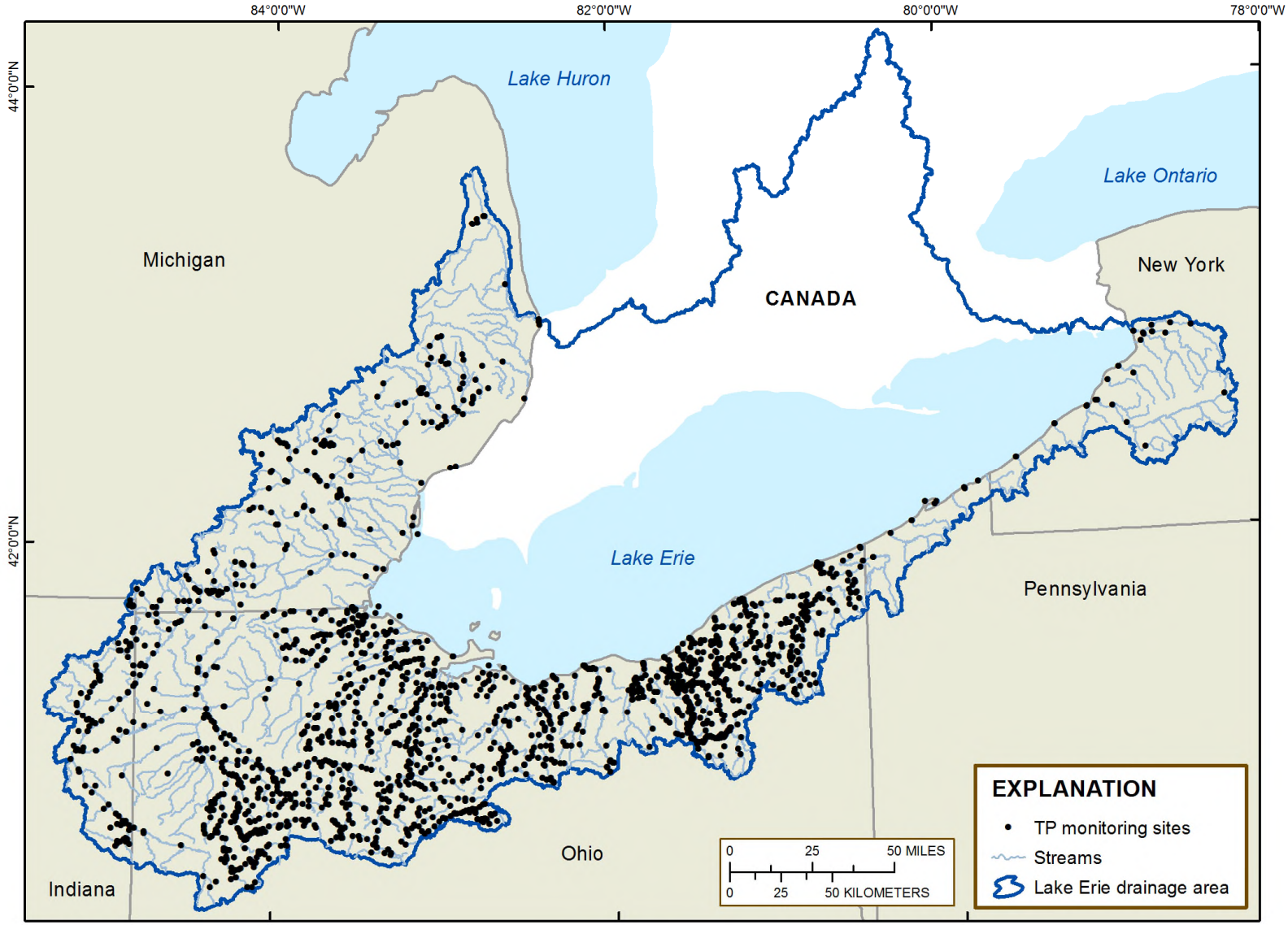
- Monitoring duration depends on magnitude of water-quality change and variability
- 40% phosphorus load reduction can be detected within 10 years
- 10% phosphorus load reductions projected using current AMP implementation rates

What does it mean?

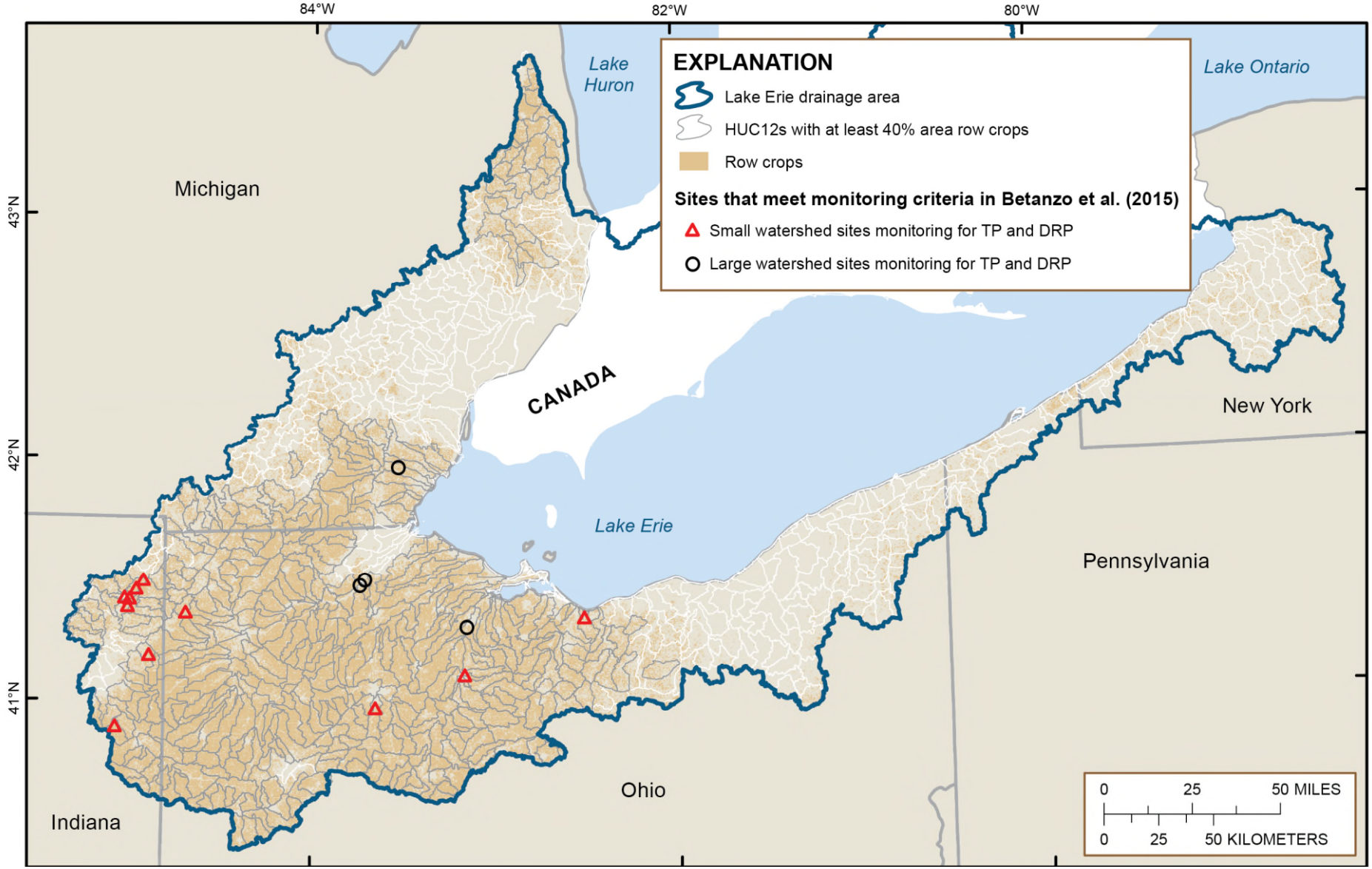
- Plan for at least 10 years of monitoring
- Maximize AMPs within monitored watersheds to minimize time to detect change

AMP = Agricultural management practice

How Many Monitoring Sites Have Data for Total Phosphorus? Answer: 1,890 sites



How many of the 1,890 monitoring sites meet the study criteria? Answer: 15 sites



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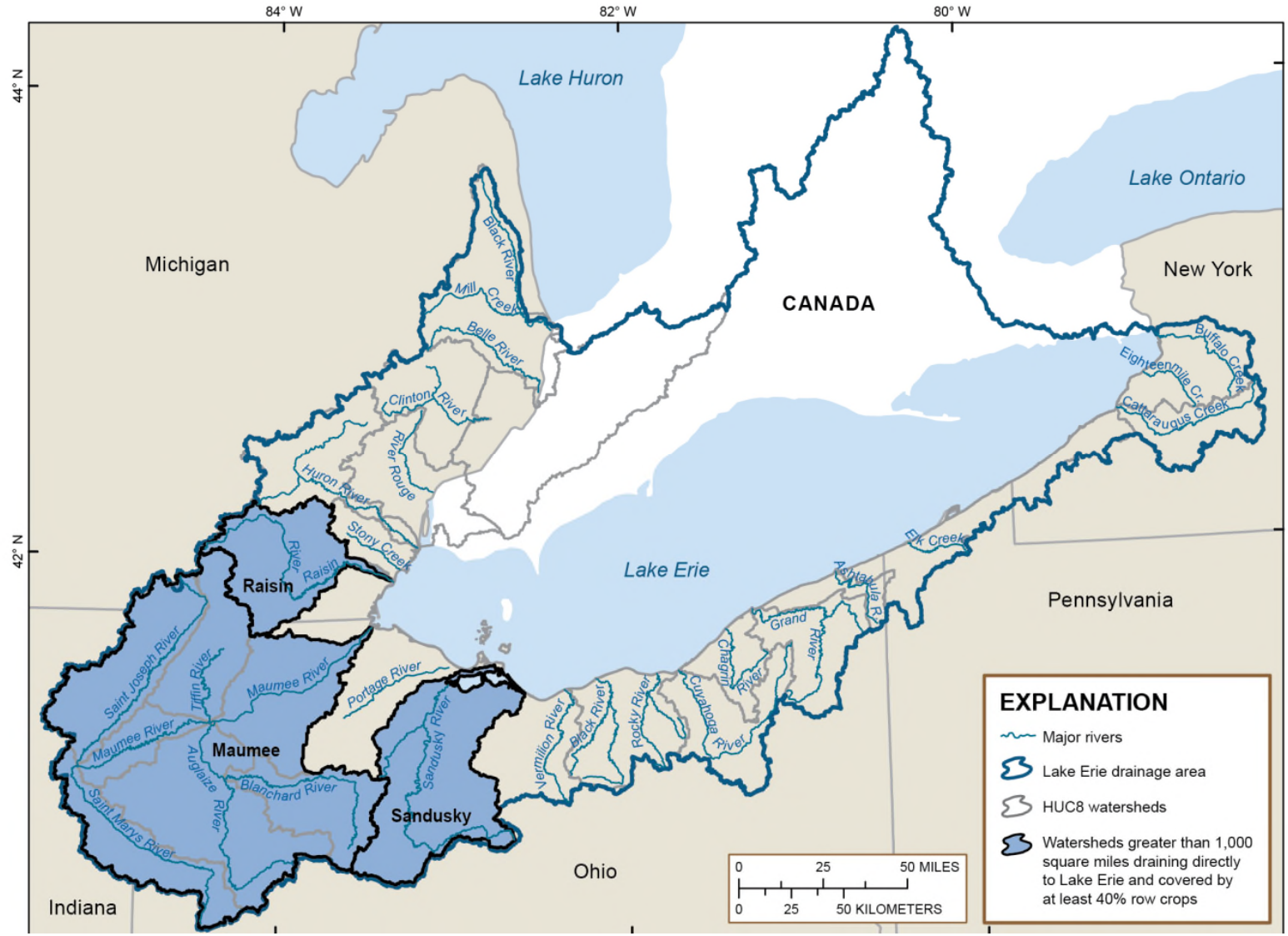
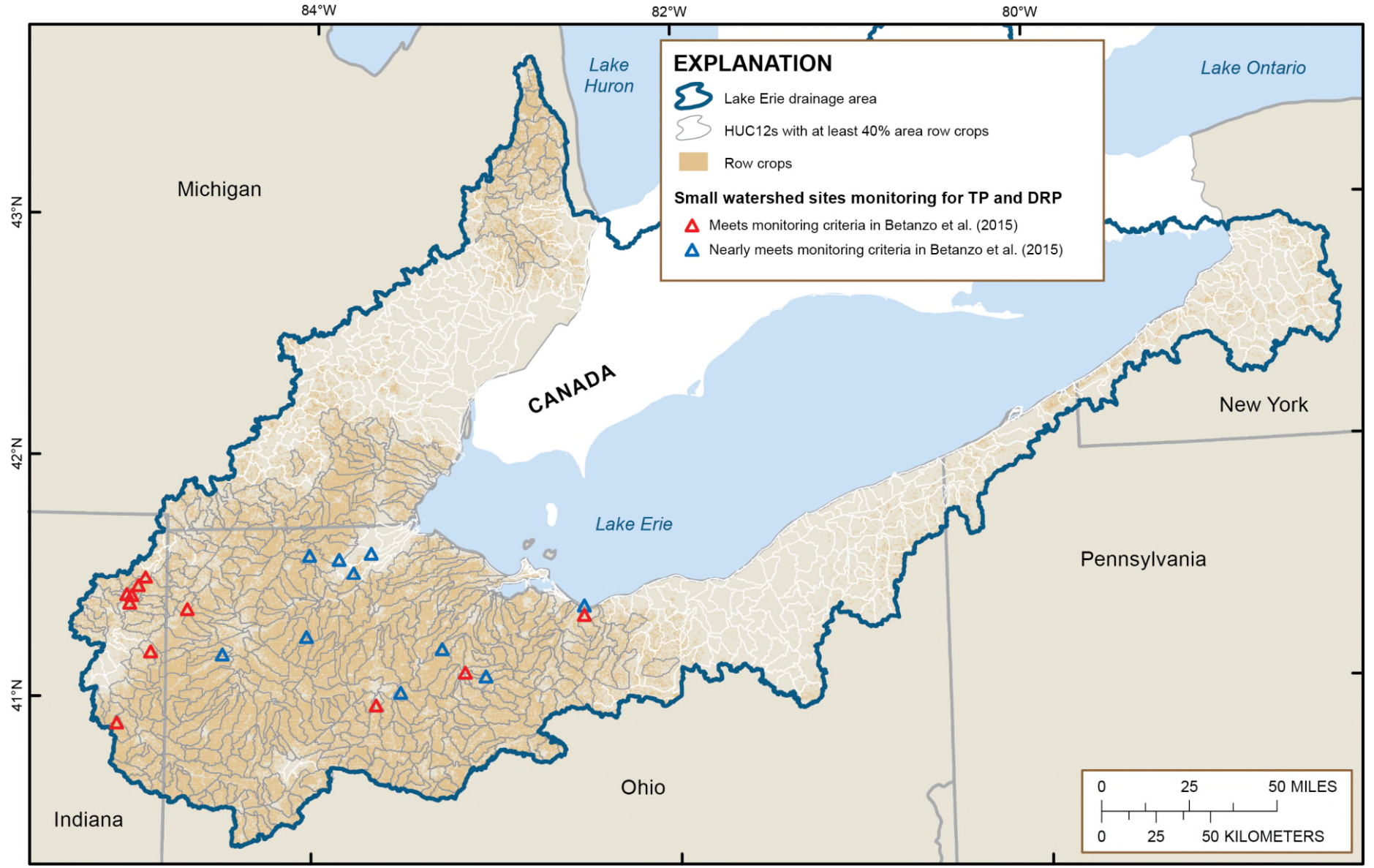
Large Watersheds: Right Data in the Right Places



Small Watersheds: A Mix of Sampling Frequencies



Who is monitoring?

- Heidelberg University
- U.S. Geological Survey
- USDA, Agricultural Research Service
- NOAA, National Estuarine Research Reserve
- Ohio Environmental Protection Agency

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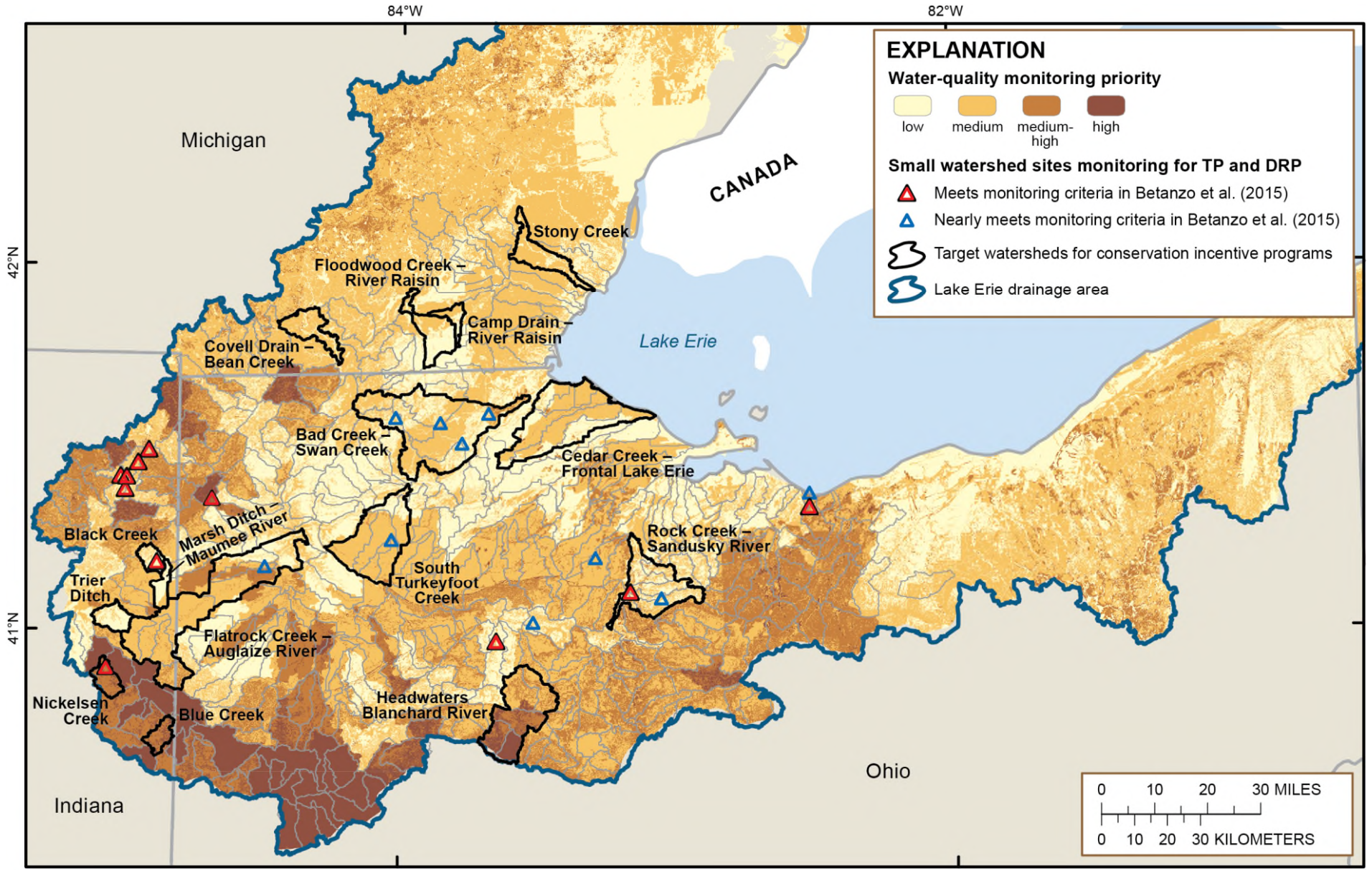
Small Watersheds: Right Data But Not in the Right Places



Right Supporting Information

Recommendations: Right Water Data in the Right Places

- Add small watershed monitoring sites and conservation incentive areas in high priority watersheds.
- Identify modifications to water monitoring and conservation incentive programs that provide the most efficient use of small watershed monitoring resources.
- Sample for a minimum of ten years after new practices are installed.

Recommendations: Right Supporting Information

- Increase the use of agricultural management practices to generate reductions that can be detected through monitoring
- Ensure access to management practice implementation and land use data
- A coordinating entity should lead a collaborative planning process enlisting both water monitoring and agriculture organizations

Study Recommendations

Collaboration and Coordination