

Why, What, and Where to Monitor, and What To Do With The Data

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*Panel Session J9 (Thursday 8:00 - 9:30am [Room 236])
National Water Quality Initiative: Using Watershed Monitoring to Track
Water Quality Improvement from Conservation Systems*

Why monitor the environment?

- To address the questions:
 - Is there a problem?
 - What's causing the problem?
 - What, if anything, can we do about the problem?

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- More specific questions, for agricultural nonpoint source (NPS) pollutant issues:
 - Is this conservation practice effective in controlling or reducing pollutants from targeted agricultural activities?
 - Does this NPS conservation practice lead to a healthier aquatic biota (= lessened biological degradation)?

Defining problems

- Elevated pollutants being loaded to aquatic systems
 - Chemical water quality
 - Physical habitat degradation (source)
 - Hydrologic alteration (source)
- Biological degradation
- WQS exceedences

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- **Stressor indicators**
 - Chemical water quality
 - Physical habitat degradation
 - Hydrologic alteration

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- **Response indicators**
 - **Biological condition**
 - Benthic macroinvertebrates
 - Fish
 - Algae (principally, diatoms)

Design Questions for Effectiveness Monitoring

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Does some indicator of biological condition (IBI, individual metric, indicator taxa[on], or other) show improvement from Time A to Time B, or Point A to Point B?

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Does water chemistry, physical habitat, or hydrologic regime show improvement or stabilization from Time A to Time B, or Point A to Point B?

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- Identifying a good baseline. *Historical data, reference site database with degradation thresholds, paired watersheds, before-after implementation (some combination, or just whatever's available)?*
- Integrating monitoring designs for stressor and response indicators. *E.g., should they be coupled, or de-coupled? Does it matter?*

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- Collecting duplicate samples. *Allows calculation of confidence intervals, or ‘minimum detectable change’.*
- Understanding hydrology. *That is, determining the effect of variable hydrologic regime on ‘functionality’ of the conservation practice.*

Ongoing activities

- Gathering existing datasets (physical, chemical, hydrologic, and biological)
 - Assistance in data organization for analysis
 - Evaluating QC data, if available
- Evaluating indicator structure, particularly biological (benthic macroinvertebrates, fish)
 - Rating framework (IBI-type, indicator taxa, or other)
 - Precision analyses (minimum detectable change, confidence intervals)
- Evaluating spatial relationships
 - pollutant sources vs. monitoring locations



Questions?