

Monitoring Nutrient Water Quality Impacts on Agricultural Lands



Background

The State Nutrient Management Strategy is working to reduce nutrient runoff into Indiana's waters from both point and nonpoint sources. The Nutrient Management and Soil Health Strategy, developed by Indiana's agriculture organizations, is helping to implement the strategies for agriculture by promoting solutions to optimize nutrient use while improving soil health and water quality on agricultural lands. Monitoring recommendations are a summary of input from stakeholders at the Indiana Ag Water Quality Monitoring Forum held August 2015.

Call to Action: Monitoring Needs

Water quality monitoring projects across the state are working to show that management solutions on agricultural lands result in water quality benefits through reduced nutrient runoff. In order to help track progress of the Nutrient Management and Soil Health Strategy, water quality data is needed to show:

- Impacts from different types of tillage (conventional, strip/ridge till, conservation tillage, never till)
- Impacts from different types of nutrient management (including source, rate, timing, placement)
- Impacts of cover crops (species, mixes, timing, seeding method, soil type)
- Impacts of drainage management (tiles, blind inlets, drainage water management, saturated buffers, two stage ditches, bioreactors, subsurface irrigation).

Monitoring Recommendations

The following recommendations for agricultural water quality monitoring projects have been developed, with input from researchers, policy makers, agriculture groups and farmers. These recommendations will be used to insure all stakeholders have common guidance in mind when developing projects, to insure funders provide support for projects striving to meet these recommendations, and to insure consistency and comparability among projects. It is acknowledged that funding is the main obstacle in implementing projects that meet all of the recommendations. The intent of these recommendations is not to discredit research that cannot incorporate all of these monitoring activities.

Critical Monitoring Activities

- Measure concentration and flow, resulting in load calculations.
- Paired watersheds or paired fields that monitor a control area compared to an area with a management or structural change.
- Relating water quality data to the management practices on the farm field.
- Include nutrients (dissolved and total forms of phosphorus and nitrogen) in the parameters being monitored.

Strongly Recommended Monitoring Activities

- Year round sampling.
- A baseline period of at least two years before making a management or structural change (applying a best management practice or changing a practice).
- Projects at various scales from the small (12-digit HUC or smaller) to the large (basins, 8-4 digit HUCs).
- Water quality and biological monitoring, both before, during and after a management or structural change.
- Consider farm field inputs as well as other possible inputs, such as streambank or in-stream inputs.
- Measure tile drains, overland flow and streams. Groundwater impacts, if appropriate.
- Long term sampling, a commitment to at least 5-10 years or more of data collection.

Next Steps

The call to action and monitoring recommendations should be helpful to researchers, policy makers, agriculture groups and farmers, and result in:

- Development of agricultural monitoring projects that match the call to action, and strive to reach the monitoring recommendations.
- Coordinated funding for projects in order to reach recommended monitoring activities for agricultural water quality monitoring.
- Increased infrastructure support for statewide monitoring and gages.
- Increased collaboration among policy makers, researchers, and ag organizations.
- Data that validates or redirects the implementation of the Nutrient Management and Soil Health Strategy.