2024 Water Quality Status Report

Water quality has a direct impact on agriculture, the environment, communities and local economies. That is why Ohio farmers are taking measures to assure clean water with voluntary efforts that are being done on a large scale with measurable results realized each year.

In 2024, the Water Quality Status Report showcases the impacts Ohio farmers are making to ensure clean water through voluntary efforts that are being done on a large scale, leading to measurable results.

A deep dive into research projects being conducted with the support of the Blanchard River Demonstration Farms Network, a Great Lakes Restoration Initiative project and joint partnership between the USDA Natural Resources Conservation Service and Ohio Farm Bureau Federation, is also featured in the report this year.

New report gauges impact of farm-level water quality efforts in Ohio

Story by Ty Higgins

The Ohio Agriculture Conservation Initiative, a collaboration of Ohio agricultural organizations, including Farm Bureau, along with conservation, academia and environmental groups, rolled out the findings of its 2023 Assessment Survey Report on practices farmers in the Sandusky watershed are using to manage water and nutrients. The assessment results show ample conservation efforts, as well as areas for improvement and continued farmer education and resourcing by OACI.

"The numbers were, overall, much stronger than I thought they were going to be, and I'm really hopeful that after H2Ohio is factored into these assessments in the future that those figures will be even bigger," said Kris Swartz, Wood County farmer and chair of the Ohio Agriculture Conservation Initiative. "The amount of producers embracing technology and using grid sampling and variable rate applications stood out to me and paints a bright picture for the future of this watershed."

The survey results establish a baseline of adoption for various farming practices in the Sandusky watershed. The information will allow for a more targeted approach to help increase some practices, while also displaying that some practices are already adopted at an adequate level.

"The assessment survey allows us to understand which conservation practices are being adopted and some background on the decisions being made by farmers," said Dr. John Fulton, professor and Extension specialist, College of Food, Agricultural, and Environmental Sciences at the Ohio State University.

"Many times when we do surveys like this, it's easy to focus on what lifts up the farmer and shows what they are doing well, but this assessment didn't leave much doubt about what farmers in this part of the state are doing for water quality," said Jordan Hoewischer, director of water quality and research with Ohio Farm Bureau. "If I was a farmer or a soil and water technician, I would be pretty proud of the progress that's been made in this watershed."

About the survey

The survey assessed cost share program enrollment, acres farmed and ownership status, tillage, nutrient applications and other nutrient management strategies, and water management practices.

Key findings from survey:

- Approximately 57% of the fields surveyed were currently enrolled in a cost share conservation program, including both state and federal level programs.
- Most farmers were testing their soil adequately, with 92% of the fields surveyed being sampled every four years. The vast majority of soil samples (85%) were being done using precision agriculture, via grid or zone methods.
- 62% of fields surveyed had phosphorus applied using variable-rate technology; 21% of fields had nitrogen applied using VRT.
- 55% of the fields were either no tilled or minimally tilled.
- 59% of the farmland assessed was owned by the farmer and 41% was in a lease.
- Farmers know their land, as 92% of the fields had been managed by the farmer for three years or longer.
- Farmers used fertilizer retailers and crop consultants for 87% of fields surveyed.

- Commercial fertilizer is the majority nutrient source (80%) used in this region, followed by manure (14%).

This assessment survey is the second in what is an ongoing program by OACI, conducting survey assessments of watersheds around the state and re-surveying each previously surveyed watershed every few years.

The first survey assessed the Lower Maumee watershed

OACI conducted the assessment survey through a randomized sampling of 433 crop production fields within the HUC8 Sandusky watershed. A statistical approach was implemented to determine what practices are being used by farmers within this watershed to manage water and nutrients. In the field survey process, all the cropped fields within the watershed were considered in the randomized selection process regardless of farm and field size. This survey was completed prior to the implementation of H2Ohio practices.

A trained Soil and Water Conservation District employee interviewed the landowner or farm manager for each field surveyed. The Ohio State University and the Center for Survey Statistics and Methodology at Iowa State University helped in designing the sampling strategy and data analysis.

Collaborative OSU watershed pilot project underway

Late last summer, farmers, landowners, farm organizations, community members and researchers from different disciplines across four universities began work on a pilot watershed project in the Shallow Run Watershed.

Working with payment programs H2Ohio and the USDA Natural Resource Conservation Service, the pilot watershed project seeks to ground truth adoption of nutrient management strategies by linking them with water quality changes in a productive agricultural watershed.

The five-year project will evaluate soil health, nutrient management strategies, and other practices that limit phosphorus loss by supporting partnerships with farmers and farm organizations to implement and adopt conservation practices.

Jay Martin, professor in Food, Agriculture and Biological Engineering (FABE) in the College of Food, Agricultural, and Environmental Sciences at The Ohio State University, is the director of the multi-million-dollar project with funding from USDA-NRCS, the state of Ohio via H2Ohio and the Ohio Department of Agriculture, and more than 28 partners, including Ohio Farm Bureau.

Ohio State's university partners on the project include Bowling Green State University, the University of Toledo, Heidelberg University-National Center for Water Quality Research and Kent State University.

Adding saturated buffers to field drains offers water quality benefits

Story by Gail Keck

With typical subsurface drainage systems, water flows directly through tile outlets into normal buffers, ditches and possibly streams, potentially carrying nutrients into the surface water. Adding saturated buffers to drainage systems can help farmers cut down the levels of nutrients in drainage water and also help conserve water within crop fields.

Researchers with the Agricultural and Water Quality Educational Center at Wright State University's Lake Campus have just finished a monitoring study of their saturated buffer project in the Grand Lake Watershed. This project was funded through the Blanchard River Farms Demonstration Network and involved collaboration with Mercer Soil and Water Conservation District. The demo farms project is a joint partnership between the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) and the Ohio Farm Bureau Federation, and is a Great Lakes Restoration Initiative project.

The effectiveness of the practice shows promise for improving water quality throughout the state, according to Stephen Jacquemin, PhD, biology professor with the university. "We were able to document water quality improvements in field runoff as a result of not only concentration reduction of nutrients by water passing through the buffer but also a substantial change in the sheer volume of water leaving the field."

The Wright State research team studied the effectiveness of their saturated buffer by comparing drainage from the field with the buffer to drainage from an adjacent field with free-flowing drainage.

A saturated buffer consists of a water control structure installed in a tile main ahead of the stream outlet to reroute water through a perforated distribution tile. That distribution tile runs parallel to a stream or creek through a riparian buffer planted with grasses, trees, shrubs, or a combination of vegetation. Ideally, a buffer should be at least 30 feet wide and have soil types that allow gradual water movement.

For example, the drainage system studied by the Wright State researchers has a 30-foot-wide riparian buffer along the stream planted with a mixture of grasses. Water draining through the field tile flows into a water control structure that diverts the water into the buffer through an eight-inch perforated tile. The perforated tile is buried several feet below the field elevation and extends 1,200 feet through the buffer area. Water from the tile moves gradually through the

soil in the buffer downward toward the stream.

The three-chambered water control structure has two stop logs. As water enters the control structure, the first stop log holds back water leaving the field until the water reaches a level above the stop log. This helps more water infiltrate into soils in the field. As the drainage water flows over the first stop log, it is diverted into the buffer area. If enough water flows out of the field, it flows over the second stop log, and empties into the creek without filtering through the buffer.

The study showed that much less water flowed directly into the stream from the field with the control structure and buffer strip than from the comparison field with free-flowing tile. In 2021, the free-flowing tile ran for 300 days and in 2022, the tile ran 189 days. The tile from the buffered field ran only 45 days in 2021 and 23 days in 2022.

In addition to monitoring the volume of water draining from fields, the researchers installed groundwater wells within the buffer to evaluate water quality changes as water moved from the distribution tile toward the stream. A comparison of water from the monitoring wells with water from field tiles showed an average decrease in nitrates of about 59% and an 84 % decrease in soluble reactive phosphorus.

Saturated buffers are a relatively new practice in Ohio and there aren't many in use yet and are not always suitable for every field situation. They have the potential to be a valuable new tool for protecting water quality and enhancing crop yields. The cost to install one is between $5,000 and $10,000 and they may qualify for cost share funding through local Soil and Water Conservation Districts and the Natural Resources Conservation Service.

Caption

Additional waterway studies

Wright State University researchers also have several other projects related to water quality underway, including monitoring of a new cascading grassed waterway system. It consists of a series of 3 shallow runoff retention basins interspersed with grassed prairie vegetation flats. They've just started working with Ohio EPA and Mercer County Soil and Water on the project. As monitoring continues to evolve at the site they will be looking at concentrations, volumes, and load changes associated with this innovative practice.

Tracking stream channel migration and bank erosion

Story by Gail Keck

Stream bank sediment erosion affects stream health negatively through the decline in function and shape of a stream channel, wildlife habitat, riparian zones, turbidity and water quality. A team of researchers at the Ohio State University, led by Dr. Asmita Murumkar, Ecosystems Services field specialist with OSU Extension, have initiated a research project to track stream migration and erosion from streams and landscapes in the Blanchard River Watershed.

The team will use emerging remote sensing and data analytics techniques in the field of surface drainage and stream geomorphology, climate and watershed modeling, and monitoring water quality in-situ data to study the stream migration and associated sediment losses. The outcomes of the proposed project will provide insights into watershed planning and streambank stabilization practices, ultimately, enhancing water quality in downstream water bodies.

The end-users of the findings from this proposed project include local watershed groups, state and federal agencies, local professionals such as SWCD staff, county engineers and researchers as well as teachers, extension educators and crop consultants.

The project is funded through the Ohio Sea Grant's Harmful Algal Bloom Research Initiative supported by the Ohio Department of Higher Education. The research team includes Dr. Jon Witter, Chair of Horticulture Division and Associate Professor of Agronomy and Soils at The Ohio State Agricultural Technical Institute (ATI), Dr. Vinayak Shedekar, Assistant Professor and State Extension Specialist of Agricultural Water Management and Dr. Lorrayne Miralha, Assistant Professor of Watershed Modeling and Data Analytics in the Department of Food, Agricultural and Biological Engineering at OSU.

DeWine announces statewide open enrollment for H2Ohio

In April, Gov. Mike DeWine announced the Ohio Department of Agriculture's H2Ohio program would enroll 500,000 acres statewide in the 64 counties outside of the Western Lake Erie Basin.

DeWine launched H2Ohio in 2019 as a comprehensive initiative aimed at addressing various threats to water quality, including harmful algal blooms caused by phosphorus runoff. H2Ohio's agricultural program, which initially focused solely on farms located in northwest Ohio near Lake Erie, incentivizes farmers to implement science-based, proven best management practices to prevent nutrient runoff and improve water quality.

"H2Ohio is now firmly established in northwest Ohio, giving us the opportunity to take this program to other parts of the state," said Governor DeWine. "We appreciate the commitment that our current H2Ohio farmers have shown to protecting Lake Erie, and we look forward to engaging more producers across Ohio on how they can contribute to cleaner water throughout the state."

Producers who enrolled by the May 31 deadline received support to develop and implement Voluntary Nutrient Management Plans, which encourages better utilization of nutrients applied.

"The progress we've made with water quality in northwest Ohio has shown the agricultural community is dedicated to doing their part," said Ohio Department of Agriculture Director Brian Baldridge. "Offering the same incentives to our farmers across the rest of the state ensures we are all working together to continue to protect our most valuable resource."

ODA works closely with county Soil and Water Conservation Districts to administer participant contracts, provide technical assistance, and support producers with the implementation of best management practices. H2Ohio provides producers cost-saving benefits, such as financial and technical assistance, to implement conservation practices that are proven to improve soil health and water quality.

New video series highlight VNMPs

A new Field Leader video series, produced by the Ohio Ag Net and Ohio's Country Journal covers what Voluntary Nutrient Management Plans are, how they are created and how farmers are utilizing them to take part in the H2Ohio water quality initiative. The series also features a conversation with Dr. Chris Winslow, director of the Ohio Sea Grant College Program to talk about the latest research being done at Stone Lab to improve water quality in Lake Erie and beyond.

Visit ofb.ag/3UQYIJb or scan the QR code for more information.

Water Quality By The Numbers

H2Ohio By The Numbers

- **$270 million** total 2024-25 investment into H2Ohio.
- **2,400 farmers** across **24 counties** in Lake Erie Watershed.
- **1.4 million acres** enrolled into VNMPs (Voluntary Nutrient Management Plans) and **2.2 million acres** in the four best management categories for better nutrient management.
- **35%** of WLEB (Western Lake Erie Basin) acres enrolled.

Ohio Agriculture Conservation Initiative

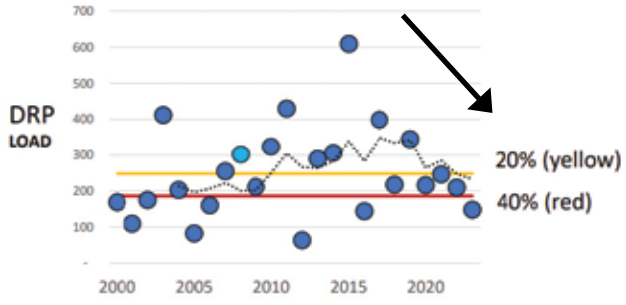
Coalition of **18 organizations** representing agriculture, conservation, environmental and research communities to recognize farmers for their dedication to advancing methods that improve water quality in Ohio and increasing the number of best management practices being implemented on farms.

4R Nutrient Stewardship Certification Program

10 years, **5,000** farms covering **2.5 million acres** serviced by 4R certified agricultural retailers.

Dissolved Reactive Phosphorus (DRP)

Dissolved Reactive Phosphorus (DRP) is trending down.



Source: Lake Erie Commission

No Manure Loopholes

- **Senate Bill 1 -** No fertilizer or manure applications allowed by state law if the weather or soil conditions not met.
- **Senate Bill 150 -** All fertilizer applications to over **50 total acres** must be applied by a state certified applicator.
- CAFOs (Concentrated Animal Feeding Operations) are a **ZERO** discharge operation.
- All manure applicators are required to follow NRCS 590 standards which involve managing the amount, placement, and timing of plant nutrients to obtain optimum yields and minimize the risk of surface and groundwater pollution.

Manure Statistics

- Only **12%** of Lower Maumee watershed fields receive manure.
- Only **14%** of Sandusky watershed fields receive manure.

Lower Soil Test Levels

- **65%** of Ohio counties had decreasing trends in mean soil test P (STP) levels between 1993 and 2015.
- From 2001 to 2020, median soil test P levels dropped from **38 to 26 ppm** Mehlich 3 on average across the state.
- Since 2003, Ohio's P2O5 (phosphorus) removal through crop harvest has exceeded P applied as a nutrient, resulting in a net annual removal of **8 pounds of P2O5 per acre.**

Blanchard River Demo Farms Network

- 10 year, **$2 million** project in partnership with USDA-NRCS.
- Over **3,000** farmers, students, legislators, scientists and media members have visited the farms.
- **3 family farms**