Ohio Nutrient Forum

# VISIONING WORKSHOP

# Meeting Summary

**Columbus, OH • November 14, 2012 • 9:00a.m. – 4:30p.m.**

Ohio
Department of Agriculture
Environmental Protection Agency
Department of Natural Resources

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## Background and Introduction

Nutrient pollution is a major water quality problem in Ohio and throughout the nation. While efforts to control nutrient enrichment over the past 30 years have yielded some positive results, current evidence shows the need to develop newer solutions and improve the effectiveness and efficiency of existing strategies to reduce nutrients in our waterways. To address this national problem, the U.S. Environmental Protection Agency has asked states to develop statewide nutrient reduction plans. States are in the best position to collaborate and find effective solutions to the statewide nutrient issue. Ohio's Environmental Protection Agency, Department of Agriculture, and Department of Natural Resources have started the process of developing a statewide Nutrient Reduction Strategy.

The Ohio Nutrient Visioning Workshop, held on November 14, 2012, gathered representatives from key agencies and organizations (see the list in Appendix A) to discuss the need for coordinated statewide nutrient reduction effort. Attendees provided meaningful input and began to discuss workable approaches to address various nutrient pollution sources in Ohio. Additionally, the meeting presented a forum for attendees to exchange information regarding tasks, initiatives, and ideas related to nutrient management in Ohio.

## Welcome and Introductions

**Mr. Barry Tonning (Tetra Tech, Meeting Facilitator)** began by surveying the group for agency representation, asking attendees to raise their hand when the sector they represented was called out. Thus, it was apparent that all sectors that nutrient management affects were in attendance.

**Mr. Tim Henry (Assistant Director, U.S. EPA Water Division Region 5)** made some opening remarks. First Mr. Henry stressed that the problem of nutrient pollution is widespread and persistent in many states. He then stated that he commends the three hosting agencies (Ohio Department of Agriculture (ODA), Ohio Environmental Protection Agency (Ohio EPA), and Ohio Department of Natural Resources (Ohio DNR)) for coming together in a coordinated manner to solve the state's nutrient management problems. Mr. Henry then discussed that almost exactly a year ago, EPA received *Ohio's Nutrient Reduction Strategy Framework for Ohio's Waters – Draft* (Draft Framework), which stressed cooperation amongst state agencies and that is exactly what we see here today. Mr. Henry stated that EPA is happy to see that Ohio is taking the next step and moving the Draft Framework towards finalization.

**Mr. James Zehringer (Director, Ohio DNR)**, then shared his thoughts with the attendees, thanking EPA for providing Ohio with the means for moving forward with their Draft Framework. He stated that it has been incredibly helpful to have leadership from Washington. Mr. Zehringer stated that Ohio must work to ensure that the regulations or practices this effort results in not only protects the state's waters but also allows Ohio's industries to prosper.

**Mr. Dave Daniels (Director, ODA)**, then spoke about the agricultural communities' role in nutrient management, stressing that nutrient pollution is everyone's problem, not solely an

agricultural issue. Additionally, he stated that it is not just Ohio's problem, echoing Mr. Henry's sentiments that almost every state in the U.S. must deal with nutrient pollution in one form or another. Mr. Daniels emphasized that Ohio must determine which of the many nutrient management protocols works best for its industries and waterbodies.

**Mr. Scott Nally (Director, Ohio EPA)** addressed the group, stressing his excitement and pleasure with the attendance at the meeting and with the range of stakeholder representation. Mr. Nally emphasized to those in attendance that their input and comments raised today would influence Ohio's Nutrient Management Strategy. He then discussed this state-wide strategy, stating that it will be a dynamic document that will attempt to equally address the nutrient issues in Ohio.

## Background on State Nutrient Reduction Approaches

Mr. Tonning then introduced the first presenter of the day, **Mr. Thomas Davenport (U.S. EPA Region 5)**. Mr. Davenport began his presentation by stating that nutrient pollution is an international problem, adding that the European Union is in the process of making nutrient reduction regulations as well. Mr. Davenport then presented various recommendations for states in the process of managing a nutrient problem based on his experience in other states within Region 5. Below is a list of the key observations Mr. Davenport provided to the audience:

1. Institutional problems, such as various agency responsibilities, different time scales, complex and numerous best management practices (BMP), segmented state leadership, and the presence of multiple nutrient management plans in one state.
2. Data gaps that are not being adequately addressed.
3. Sector's unwillingness to "own the load".
4. More focus should be placed on keeping nutrients on the land and out of the water, the current focus on reducing the use of nutrients has not worked well.
5. The goal of a state-wide nutrient management plan should be preserving water quality and quality of life in your state, something that makes sense to your citizens.
6. Combating the challenge of nutrient pollution will require a profound long-term change in how we implement programs, share accountability between sources, within watersheds, and across state lines.

Mr. Davenport then stated that local leadership is the key in changing behavior and that the private sector needs to be involved. He further emphasized that monitoring, planning, implementation, and evaluation need to be integrated at the state level. In conclusion, Mr. Davenport encouraged Ohio to start tackling nutrient pollution today, stating that the state has the tools and should not wait until an official "plan" is in place, and this issue needs to be addressed today.

An audience member asked Mr. Davenport how EPA and states determine where the heaviest loads are from farmland within a watershed. Mr. Davenport stated that you typically look at topography and soil characteristics, as well as where management practices are used that reduce nutrient runoff.

## Visioning Workshop Objectives

Mr. Nally discussed the Nutrient Visioning Workshop's objectives, and set the stage by stating that 47% of Ohio's waters that have been sampled are not meeting their intended uses. He stated that the key for Ohio will be insuring the intended uses of Ohio's waterways are met. Mr. Nally explained that all sectors involved in this process are involved in programs to tackle this issue. The agricultural sector has been making progress on BMPs, the business communities have been reducing their effluent discharges into waterbodies, municipalities have been updating their sewer systems to handle overflow events, and urban areas are creating more robust and aggressive stormwater permits to reduce stormwater runoff. Mr. Nally stressed that while we are all making progress and involved in efforts to reduce nutrient loads, Ohio still has impaired watersheds and blue-green algae is quite prolific across the state and has impacted previously previously unaffected waterbodies. Our goal should be to synchronize our efforts and identify what works in Ohio and what does not.

An audience member asked if Ohio EPA had created language on their website to explain the technical issues and topics related to nutrient in terms that a regular citizen would understand. Mr. Nally stated that Ohio EPA does not do that but that it is a great suggestion. The Agency will make note of that, particularly in places on the website that mention monitoring data. Another question was raised regarding Ohio's coordination with neighboring states. Mr. Nally stated that there are various interstate committees that Ohio representatives participate in, specifically Ohio EPA coordinates and interacts with Michigan and Canadian officials on the nutrient pollution issue.

## Status Report on Water Quality Conditions and Point Source Loadings

**Mr. Jeff DeShon (Manager, Ecological Assessment Section, Ohio EPA)** spoke to the attendees about water quality conditions, specifically the assessment and reporting of the nutrient problem affecting Ohio water resources. Mr. DeShon began by discussing the three Clean Water Act reporting requirements that are included in their Integrated Water Quality Monitoring and Assessment Report. He then went through the four designated uses of waterbodies in Ohio:

1. Human Health
2. Recreation
3. Aquatic Life
4. Public Drinking Water Supply

Mr. DeShon presented various tables showing the number of waterbodies in Ohio that either support, cannot be determined, not supporting (action not required), or not supporting (action required). He then explained that a waterbodies attainment status is driven by response indicators (i.e., Ohio's biocriteria) and cause and source determination involves the interpretation of multiple lines of evidence. Such evidence used by the agency includes:

- Water chemistry data
- Sediment data
- Physical habitat data
- Effluent data

- Biomonitoring test data
- Land use data
- Biological response signatures within the biological data

Mr. DeShon also stated that the greatest aquatic life impairment is caused by land disturbances related to agriculture activities and urban development. He then further specified the impairments stating that organic enrichment, hydromodification, habitat alterations, nutrients, and siltation/sediment are the most common causes of impairment for aquatic life.

**Mr. Dale White (Supervisor, Modeling and Assessment Section, Division of Surface Water, Ohio EPA)**, discussed nutrient pollution from urban point sources. Mr. White presented an analysis he had performed to track a mass of pollutant discharged into waterbodies in one year. He compared three different watersheds in Ohio based on the presence of combined sewer overflows (CSOs), regions with long-term, in-stream chemical monitoring, seeking to compare nutrient loads in high urban to high non-urban regions. Mr. White explained his methodology thoroughly to the audience. He then presented his results, which compared "annual total load" (all pollutants measured at a downstream gage), to "point source load" (all pollutants measured leaving WWTs and CSOs). The graphs he displayed showed that the urban loads in most river basins contribute a small portion of the total phosphorus and nitrogen inputs. Mr. White stated that there is obviously some source(s) that his model is not taking account for that is greatly impacting Ohio's waterbodies, which is likely nonpoint source pollution.

## Nutrient Impacts to Ohio's Drinking Water Supply

**Mr. Michael Eggert (Assistant Chief, Division of Drinking and Ground Waters, Ohio EPA)** began by outlining ways nutrients impact drinking water and the various methods of treatment for drinking water, only one of which is capable of removing nutrients effectively (reverse osmosis and ion exchange). Mr. Eggert then covered the economic impacts of increased nutrients entering our drinking water sources, specifically in Freemont, Marysville, and Columbus. He then discussed the occurrence of HABs in Ohio's waters, stating that their prevalence has been increasing over the past few years; from 2010 to 2012 twenty public water systems had toxins in their raw water. Mr. Eggert stressed that the removal of nitrates, cyanotoxins, taste and odor compounds, disinfection byproducts, and pesticides place an economic burden on many Ohio communities resulting in increased capital expenses and annual operating costs.

## Emerging Science

**Mr. Kevin King (U.S. Department of Agriculture (USDA))**, spoke to the audience about emerging science in mitigation strategies for dissolved phosphorus transport. Mr. King began by stating that while farmers provide society with food, feed, fiber, and fuel the key is how we equilibrate between economic efficiency and ecological impact in this sector. Mr. King stated that to strike that perfect balance between economic and ecological efficiencies requires a shift in scale, with more efficient agronomics combined with practices that provide healthier soils and approaches that effectively manage landscapes and their natural variability. He believes that the agricultural sector needs to integrate knowledge about landscape variability, hydrology, and ecosystem processes into production agriculture. Mr. King further emphasized

that agricultural systems are inherently "leaky" and this fact must be taken into account when we develop approaches to minimize the impact of agriculture.

Mr. King spoke at lengths about tile drainage, highlighting the fact that roughly 25% of the cropland in both the U.S. and Canada could not have been developed without the use of tile drainage. When tile drainage is present an increase of 5-10% in total discharge could be expected, compared to systems without tile drainage. Mr. King then described various types of current research being conducted on tile drainage in the U.S. and abroad. He also discussed various nutrient mitigation strategies, including:

- Upland Management
  - 4Rs: right source at the right rate, time, and place
  - Interruption of connection to surface
- Structural Hydrologic Control
  - Drainage water management
  - Blind inlets
- Filtration
  - End-of-tile and in-stream
  - Enhanced bioreactors
- Edge-of-field
  - Buffers
  - Wetlands
- Ditch Design and Management
  - Two stage, natural, and over-wide ditches
  - Dredging
  - Vegetated channels

In conclusion, Mr. King provided three different implementation strategies: a market approach (supply and demand, watershed based co-op, or trading), Incentives and Voluntary Implementation, and regulation. He emphasized again that we need to strike the right balance between economic and ecological interests and Ohio must decide which path to take, each has benefits and drawbacks, it is simply a matter of finding what works best for Ohio's producers and ecosystems.

## State Agency Activities and New Initiatives

**Mr. Dan Dudley (Manager, Division of Surface Water, Ohio EPA)** introduced representatives from ODA, DNR, Lake Erie Commission, and Ohio EPA. Each representative briefly described the recent activities and initiatives his or her agency was involved in related to nutrient management. The ODA representative stated that they are involved in plant health and fertilizer regulation and track where nutrients in the state are distributed. They are looking to collect better data on the fate of nutrients in Ohio's waterways to be used in a state-wide mass balance. ODA also partners with Ohio State University (OSU) who offers applicator training through their Ohio Pesticide Safety Training Program.

The representative from DNR stated that their greatest efforts are in trying to identify and implement pollution prevention strategies. Hazardous algal blooms (HABs) are of key concern, and the agency is looking to not just respond to these instances, but prevent them from occurring in the first place. The agency also oversees farmer's nutrient management plans and monitor progress made in their implementation. In early 2012, Ohio's Directors of NDR, ODA, and the Ohio EPA were charged by Governor Kasich with developing recommendations for improving Ohio's waterways while maintaining the integrity of the region's agricultural industry. The recommendations included in the report are being carried out through the new Clean Lakes Ohio Initiative. DNR also facilitates and implements market-based water quality trading programs in the state.

The Lake Erie Commission representative stated that they are also trying to increase monitoring of BMPs and various projects in the lake. An additional factor that they are trying to tackle is the internal nutrient loads in Lake Erie (i.e. re-suspended nutrients). The Commission has also convened the two iterations of the Lake Erie Phosphorus Task Force with assistance from other state agencies. The Ohio Lake Erie Phosphorus Task Force convened in 2007 to review and evaluate the increasing dissolved reactive phosphorus (DRP) loading trends and the connection to the deteriorating conditions in Lake Erie. Phase II of the Ohio Lake Erie Phosphorus Task Force will incorporate findings of current research results and develop a broader consensus on the management actions necessary to decrease algal blooms in the Lake Erie western basin.

The representative from Ohio EPA stated that the agency is the key water quality agency, responsible for regulating and maintaining the quality of the state's water. Ohio EPA has created a framework for Ohio's Nutrient Management Strategy (November 2011) and has formed specialized work groups, including:

- Lake Erie Phosphorus Task Force (1 & 2)
- Director's Agricultural Water Quality Workgroup
- Point Source & Urban Runoff Workgroup

Ohio EPA's future goals include finalizing the Ohio Nutrient Management Strategy using the workgroup recommendations made over the past year, input received today and filling in any existing data gaps on load reduction calculations, tracking, priority setting, and funding needs.

## Session 1.1 – Setting the Right Standards and Loading Targets

Panelists discussed their thoughts on how Ohio might set standards for nutrients, what is required under the Clean Water Act, the likely resulting nutrient loading targets for point and nonpoint sources and what it would take to reduce loadings by 50 percent or more.

### Dan Dudley, Manager, Standards Section, Ohio EPA Division of Surface Water

Mr. Dudley began by discussing Ohio's nutrient management progress to date. He stated that Ohio EPA has field studies that have supported the development of Trophic Index Criterion (TIC), a multi-metric approach of diagnosing nutrient pollution in streams and rivers. Mr. Dudley emphasized that the state does not want to be told what to do by EPA, as is the case in Florida,

and therefore we must confirm the problem is from nutrients using several lines of evidence, expect load reduction goals of 50% or more, and initiate steps to correct with all available tools.

### Larry Antosch, Senior Director, Policy Development and Environmental Policy, Ohio Farm Bureau Federation

Mr. Antosch began by stating that we need to understand what direction we want to take Ohio and decide on which is the right approach. Ohio has succeeded in establishing ecoregion criteria and reference sites but there is still a lot of work to be done. Mr. Antosch emphasized that Ohio's strategy should not interfere with the state's overall economic recovery, stating that this is simply common sense approach. Areas that likely need more attention include understanding the transport and delivery of nutrients in Ohio and the lag time inherent in BMP application. To this latter point, Mr. Antosch added that regulators and industry need to understand that it takes time to reach a target level of nutrient concentrations and we must remain steadfast in our standards and not change them every five years.

### Andrew Ward, Professor, Department of Food, Agricultural and Biological Engineering, the Ohio State University

Mr. Ward began by stating that a systems approach to setting nutrient standards and loading targets will most likely lead to great success for Ohio. He reiterated Mr. King's earlier remarks regarding the integration of the upland/in-field, edge of field, and downstream scale for nutrient reduction efforts. Mr. Ward believes that Ohio's nutrient issues are a collective problem and that all parties should be involved and must work together to achieve meaning progress. Mr. Ward discussed various nutrient control technologies that have been implemented and monitored. He provided the attendees with the following recommendations:

1. Solutions should be based on system specific knowledge and consideration of the causes and pathways of sediment and nutrients movement within fields, from fields, through systems such as ditches and streams, and into lakes.
2. A process based systems approach that incorporates a combination of methods should be used.
3. The focus should not just be on soluble reactive phosphorus (SRP).
4. Practices that are field specific are likely to be the most practical, beneficial and affordable but might not always provide adequate reductions in flow, nutrient, and sediment exports.
5. Edge-of-field and in-stream treatment practices will be needed in some settings.
6. Historically, voluntary approaches that provide incentives to adopt BMPs have been the most successful.

### Elizabeth Toot-Levy, Senior Environmental Specialist, NEORSD, Association of Metropolitan Wastewater Agencies

Ms. Toot-Levy discussed the critical data gaps present in Ohio's nutrient knowledge base. She emphasized the need for a statewide nutrient mass balance that accounts for all point and non-point sources of nutrients in the water environment. Additionally, Ms. Toot-Levy stated that Ohio must develop a sustainable mechanism to maintain this data with regular reporting on nutrient loadings and resulting water quality conditions in Ohio watersheds. She outlined the key aspects of Ohio's nutrient water quality criteria, including: Be technically and scientifically

defensible, and adequately reflect the full range of biological, chemical, and physical properties of the waterway, ultimately protecting the designated use; be based on demonstrated and quantified cause and effect relationships and appropriately qualified by the uncertainty in that relationship, and not be used as the basis for imposing nutrient controls unless the weight of the evidence indicates that impacts have or will result from excess nutrients. Ms. Toot-Levy concluded, stating that all sources of nutrients (point and non-point) need to be addressed and stressed that without significant involvement from all parties (point and non-point) it will impossible to attain meaningful reductions and water quality improvements.

## Session 1.2: Methods to Target and Prioritize Watersheds

This session began with a discussion of how the state prioritizes watersheds. There were four main criteria that the panel provided:

- Contributing the most phosphorus (e.g. Lake Erie and Ohio River tributaries)
- Watersheds with completed TMDL's
- Watersheds with Watershed Action Plans
- Severe downstream impacts

A panel member suggested that Ohio might need to work backwards, start by identifying the loading sources and amounts with sound science, then attempt to implement BMPs and other programs. The attendees also discussed looking at fish kill data to identify the seasonality and severity of nutrient loadings. Once the data has been collected, there needs to be agency engagement in finding cheaper and easier solutions to reducing phosphorus for point sources, this could fall under compliance assistance within Ohio EPA or DNR. There also needs to be a real time tracking of needs and successes within Ohio's nutrient management effort, then use such information to target those areas of the state that require the greatest assistance.

The panel then discussed local experimentation with nutrient reduction techniques including nutrient reduction at wastewater treatment plants, local areas using the 'trial and error' method to see what works and doesn't work on a small scale then taking what works and implementing those techniques on a larger scale. Many in the session agreed that using local knowledge is critical and extremely beneficial to nutrient reduction programs. One audience member also suggested volunteer monitoring as a way to bolster the statewide database. The panel and the attendees worked together to produce the following ideas for prioritization of watersheds:

- Prioritize highest TMDLs
- Mix of conservation techniques watching the quality of water (Diversity in bugs and fish)
- Compare the before and after (intakes and outfalls)
- Easy ways to reduce phosphorus (plants)
    - Point-source is easier to fix
- Look at the source protection that Ontario Canada uses
    - Watch the intakes closely
- Improve the natural flow of rivers/water

The panel also discussed the following watershed project examples:

- Crawford County Soil & Water Conservation District.
    - Provide alternative incentives (A or B)
        - We pay for the filters
        - We pay per acre to lower phosphorus levels
- Cuyahoga County
    - Identified urban watershed problems
        - 31 projects on the ground in 3 years
    - Taking what worked and expanding to other urban watersheds
- Dams removed in the Olentangy River and from the Stillwater River which improved the habitat in both.

## Session 1.3: Funding Implementation of Nutrient Reduction Efforts

Panelists discussed their thoughts on the likely costs of nutrient reduction efforts in Ohio. Funding options currently in place were presented and some approaches taken in other states were summarized.

### William Meinert, P.E., Vice President, O'Brien and Geer

Mr. Meinert began by discussing aspects of voluntary vs. involuntary nutrient reduction efforts, stating that the "carrot" was lower-interest or longer-term loans or grants and that the "stick" consisted of NPDES, TMDL, or Gulf Hypoxia/EPA Action. He then discussed examples of nutrient reduction projects, including the Gulf Hypoxia Program, the Chesapeake Bay Program, and Virginia's, Pennsylvania's, and Maryland's nutrient initiatives. Mr. Meinert then presented the key issues in Ohio:

- Midwest states are headwater states
    - Local WQ may dictate, Gulf delivery factor is your friend
    - POTW vs. Indirect discharge? Majors vs. all?
- Understanding the science
    - Gulf model, local TMDLs, NR processes
- Shaping a regulatory program
    - Timing, politics, administration, targets, and phasing
    - Burn both ends of the candle? (Gulf, local TMDLs, SSO/CSO)
- Political decisions by state
    - Share of reduction and when, where, why, how
- NR will require updating aging infrastructure
- Decisions regarding financing a program (incentives, control)
    - Loan, grant, local, tax, distribution

### Brian Hall, Assistant Chief, Division of Surface Water, Ohio EPA

Mr. Hall began by going over various different funding sources fo nutrient reduction projects. He discussed the U.S. Department of Agriculture's (USDA) Conservation Reserve Program (CRP). The CRP provides grant & rental payment for the removal of cropland from production by converting to native vegetation. Farmers and ranchers are eligible for funding from $400-$8,000 for rental and $100-$500 for continuous, plus incentive payments. He then discussed

the USDA's Natural Resources Conservation Service's (NRCS) Environmental Quality Incentives Program (EQIP). This is a grant program for conservation practices implemented at livestock facilities, pasture, and cropland eligible to farmers and ranchers. The funding range goes up to $300,000. Mr. Hall also discussed the 319 grants program, Ohio EPA's Surface Water Improvements Fund (SWIF), and Ohio EPA's Water Resource Restoration Sponsor Program (WRRSP).

### Chuck Bauer, Deputy Director of Utilities, Clark County Ohio

Mr. Bauer began by discussing Clark County Utilities Department Southwest Regional WWTP Plant Upgrade and Expansion Project. He discussed the various stages of the project, including the replacement of influent screw pumps, addition of new mechanical bar screen, repairing the grit chamber, building of the new influent and effluent flow meters and flumes, building the new flow splitter, replacing final clarifier mechanisms and other upgrades. The project was funding using three sources of funds: self-funding – fund revenue/short term debt, Ohio Public Works Commission (OPWC), and Ohio EPA loans.

### Greg Smith, Chief, Division of Financial and Environmental Assistance, Ohio EPA

Mr. Smith discussed the clean water needs in Ohio and the improvements that need to take place to meeting the increasing demands. He discussed projects funded in 2011 including 48 point-source projects and 153 non-point source projects in the state of Ohio.

## Session 2.1: Nutrient Trading

Water quality trading has the potential to achieve nutrient reductions and improve water quality at an overall lower cost. Trading programs can operate on a small, sub-basin scale, a large watershed scale, and possibly on a regional, multi-state scale. Whatever the scale, there are challenges in establishing a trading program, there are uncertainties about achieving the necessary load reductions and point source participants have concerns about their NPDES permit liability. The panelists discussed these and other aspects of nutrient trading and shared their thoughts on the role of trading in achieving Ohio's nutrient reduction goals.

Trading is a tool we have available to use for permitting issues, environmental issues, and compliance issues. The panel discussed how Nutrient Trading Initiatives are intended to offset needed pollution discharge reductions from local industries. The positives associated with such programs include: potential to provide needed funding sources and the potential to provide cost saving alternatives. The negatives related to nutrient trading include: the possibility of compensating farmers for installing unproven environmental effects and some initiatives enable industries to continue to pollute. A panel member stressed that the variability in practices and environments must be managed by robust monitoring and verification programs.

The panel then discussed various example projects:
The Ohio River Basin Trading Project:

- First interstate water trading program
    - Most HUC 4 watershed units cross state boundaries
- Nine counties targeted in pilot trading
- Use the WARMF (Watershed Analysis Risk Management Framework) model

- Credit trading registry where buying occurs

The Great Miami River Watershed Water Quality Trading Program:

- Founding investors could trade more favorably later
- Farmers bid competitively using reverse auction (more nutrients removed for lower prices)
- Insurance pools in place in case a project fails
- 397 projects on the ground
- Reduction in nitrous and phosphorus

The Alpine Trading Program:

- Alpine cheese factory was not in compliance
- Implementing factoring nutrient trading put them back in compliance
- NPDES 5yr permit was completed in 3 years
- Why this method worked
    - It was regulated
    - Buyer needs met seller needs
- This method is not being implemented in other watersheds
    - 21 counties came together in the Muskingum Watershed

The group formed a consensus on the fact that such an effort will take collaboration to have a successful trading program. Participation of county SWCDs is a common denominator in Ohio programs, and is a key to success. Different practices are going to work for different farmers, and trading programs need to pay attention to the farmer's needs.

## Session 2.2: Updates on Agricultural Nutrient Reduction Efforts

Panelists provided updates on their respective organization's recent and ongoing efforts to work with farmers and rural landowners in reducing agricultural nutrients in Ohio.

### Mike Bailey, Assistant Chief, Ohio Department of Natural Resources (standing in for Karl Gebhardt, Ohio Department of Natural Resources)

Mr. Bailey spoke about the conservation practices offered in a five county area of northwest Ohio under a cost share program recently funded through the Ohio Clean Lakes Initiative. He stated that his agency is offering grants to soil and water conservation district to educate farmers on ways to reduce nutrients and sediments leaving the land. Nutrient management plans and heavy restrictions on manure spread on farms during certain farms (85% of the watershed).

### Chris Henney, President and Chief Executive Officer, Ohio Agribusiness Association

Mr. Henney began by stating that in his view, the past year has been quite refreshing due to the unprecedented cooperation between Ohio DNR, EPA, and ODA. He stated that the agricultural sector will do their part in this effort and he believes it bodes well for nutrient management in Ohio to see that all sectors are represented at this meeting. Mr. Henney discussed various organizations that have come together to discuss edge of filed monitoring to examine how specific BMPs affect the water quality leaving farms and livestock operations. Mr. Henney stated that Ohio's AgriBusiness Association (OABA) supports its members by providing

governmental representation, education and training, information services, member services, and industry networking. Additionally, the OABA provides the Ohio Certified Crop Advisor Program, once certified, Crop Advisors work directly with farmers to advise them on how to best manage their resources on the land. This represents a potential avenue for BMPs and nutrient management education in the state of Ohio.

### Bill Stanley, Agnes S. Andreae Director of Conservation in Ohio, The Nature Conservancy

Mr. Stanley began by explaining the Nature Conservancy's (TNC) mission statement and how a recent change in wording has altered the organizations programs, specifically their new mission includes wording regarding protecting life on earth by preserving the land and waters on which it depends. This change has given TNC the opportunity to place greater emphasis on people and how we can act as stewards of the land. Mr. Stanley discussed TNC's efforts to create a certification program for nutrient management in the agricultural sector and have been focusing on agricultural retailers who have a large market share. The certification program would be completely voluntary but would emphasize record keeping and accountability, verified by a third party. While Mr. Stanley believes that this certification program is not a silver bullet, it does move the agricultural side of nutrient management in a positive direction and could allow this sector to avoid regulations if they show a good faith effort.

### Kevin Elder, Chief of the Division of Livestock Environmental Permitting, Ohio Department of Agriculture

Mr. Elder began by explaining that for years many in the business taught farmers that no phosphorus would leave their fields without sediment, however the dissolved portion of phosphorous had not been addressed at that time and that is what we must work towards. Additionally, Mr. Elder believes that soil quality is another issue that will plague the agricultural sector. He stated that many of Ohio's soils have lost the majority of organic compounds and their natural structure. Mr. Elder stated that Ohio has been mining their soils for a long time and have not integrated practices to replenish those naturally occurring nutrients. He also stated that this is likely representative of a knowledge gap in the farming community. Mr. Elder remarked that ODA and the other involved agencies don't have the staff to initiate and sustain education efforts across the state and this is why they must rely on independent management advisors to transmit these lessons to farmers.

An audience member asked Mr. Elder if he could explain the funding aspect of nutrient reduction in the agriculture sector and if there has been a discussion within ODA regarding sustainable funding mechanisms for nutrient management. Mr. Elder responded, saying that the agency and the state have been looking into such a mechanisms but that noting had be definitively established yet. He mentioned that the agricultural community pays taxes to ODA and that there has been some discussion about utilizing those revenues to establish a fund for nutrient stewardship activities, however there would need to be additional payments from the industry to fund the level of projects necessary.

Another audience member commented that while farmers who own their land might be interested in soil conservation projects, farmers who lease land are less likely to invest in a

multi-year BMP or other project. In response, an audience member stated that within the Sandusky River Watershed, an absentee land owners meeting would be held in January for land owners to learn about conservation practices.

An audience member stated that as the occurrence of extreme weather events increases, it will become more difficult to plan nutrient applications. Extreme weather events represent loses to the farmer in nutrient running off their field and therefore BMPs have to account for these occurrences as well.

## Session 2.3: Lake Erie Nutrient Loadings

Panelists discussed the history and current status of nutrient loads into Lake Erie and their impact on the ecosystem. They compared and contrasted 2011 and 2012 weather, nutrient loads, and blooms and discuss their collaboration with NOAA to predict the severity of the 2012 harmful algal bloom and the accuracy of their prediction.

### Tom Bridgeman, Associate Professor, University of Toledo

Mr. Bridgeman discussed the presence of HABs in western Lake Erie. He stated that Lake Erie contains hundreds of species of algae, most of which are beneficial. The three main types of algae in Lake Erie are Diatoms, Greens, and Cyanobacteria (blue-green algae, Anabaena, Aphanizomenon, and Microcystis). Mr. Bridgeman discussed the various factors leading to Cyanobacteria blooms in Lake Erie, including seasonal patterns and phosphorus concentrations, which can lead to eutrophication. Eutrophication in Lake Erie has had a long history, from 1920 to 1964 Lake Erie algae biomass increased nearly 6 fold, and the common Diatoms in the lake were replaced by cyanobacteria and subsequently HABs. The increased frequency of blooms led to passage of the Great Lakes Water Quality Assessment (GLWQA), an agreement between the U.S. and Canada that seeks “to restore and maintain the chemical, physical and biological integrity of the waters of the Great Lakes". Mr. Bridgeman then discussed the recent nutrient trends in Lake Erie and the intense HABs of 2011 and 2012.

### Jeffrey M. Reutter, Director, Ohio Sea Grant College Program

Mr. Reutter began by explain why Lake Erie is one of the most important lakes in the world. Firstly, Lake Erie presented a “dead lake” image in the 1960s and 70s and became a poster child for pollution problems in this country. The lake is the most heavily utilized of any of the Great Lakes and is shared by four states and two countries. However, Lake Erie also provides one of the best examples of ecosystem recovery in world. Mr. Reutter explained that because of land use near the lake, Lake Erie receives more sediment, nutrients (fertilizers and sewage), and pesticides. These items are exacerbated by storms, which will be more frequent and severe due to climate change. He then outlined Lake Erie’s largest issues:

- Sedimentation
- Phosphorus and nutrient loading
- Harmful algal blooms
- Aquatic invasive species
- Dead Zone
- Climate Change—Makes the others worse

- Coastal Economic Development

Mr. Reutter explained that phosphorus is the normally limiting nutrient in freshwater systems and reducing phosphorus is best strategy ecologically and economically. However reductions in nitrogen would further help the ecosystem as well.

### Peter Richards, National Center for Water Quality Research, Heidelberg University

Mr. Richards began by going over the conventional wisdom regarding Lake Erie's nutrient problems, including the fact that excessive algae reflect excess nutrients and that when an essential nutrient (nitrogen or phosphorus) is used, algal growth stops. HABs can be reduced or eliminated by controlling phosphorus and in the 1970s; most of this phosphorus came from sewage treatment plants (point sources). At present, most of the phosphorus entering the Western Basin of Lake Erie comes from the landscape (i.e. non-point source origin). Mr. Richards presented various remediation options entered around reducing the phosphorus inputs. These include detergent phosphorus ban, Sewage Treatment Plant upgrades, nonpoint source management, fertilizer and manure management, and erosion prevention (e.g. conservation tillage and buffer strips).

## Session Reports and Wrap-up

Each panel leader reported back to the entire group on the discussion and key recommendations made during each breakout session.

**Session 1.1** discussed thoughts on how Ohio might set standards for nutrients, what is required under the Clean Water Act, and the resulting limits for point and non-point sources of nutrients. Regulators and industry need to understand that it takes time to reach a target level of nutrient concentrations and we must remain steadfast in our standards and not change them every five years. Solutions should be based on system specific knowledge and consideration of the causes and pathways of sediment and nutrients movement within fields, from fields, through systems such as ditches and streams, and into lakes. Ohio must develop a sustainable funding mechanism to maintain a state-wide database with regular reporting on nutrient loadings and resulting water quality conditions in Ohio watersheds.

**Session 1.2** discussed how Ohio can prioritize and target watersheds best, suggestions for criteria to consider when identifying smaller watersheds.

- Increase soil tests at the field scale, using GIS, or a database to use to prioritize
- Start to look at the impacts and conditions at the drinking water intakes and working your way back from there
- Encouraging the use of local knowledge to help target the national programs (e.g. the farm bill, EQUIP)
- Comment on that fact that the three agencies were working together well
    - Should reach out to industry groups to help us target very limited resources

**Session 1.3** discussed funding for nutrient reduction efforts and highlighted the similarities between Chesapeake river basin and Lake Erie. The panel discussed the existing programs for funding and commented that they are not very *user friendly* and suffer from bureaucratic

sluggishness. The panel and attendees agreed that Ohio needs to have an end game for trading, and not just doing it as a band aid, but rather use trading to prioritize and guide management strategy development.

**Session 2.1** discussed nutrient trading and shared their thoughts on the role of trading in achieving Ohio's nutrient reduction goals. Everyone agreed that collaboration is critical to maintain a robust ambient monitoring system to ensure Ohio's trading program maintains integrity and validity. The participation of the S&WQ Districts is critical to the success. The session discussed how Ohio can bring innovative credit generating methods into their trading system and how it can account for the fact that BMPs will work for differently on different farms.

**Session 2.3** discussed the uniqueness of Lake Erie and its historical trends. The panel discussed how 2011 was the worst for algal blooms in the lake, with a dryer year in 2012 there will likely be less HABs. The attendees briefly discussed the "rural load" into the lake from septic systems. The panel explained that the use of Zebra Mussels did a good job in the 1980s and 90s, but their contributions confound the understanding of algal bloom processes due to their feeding cycle.

Mr. Tonning thanked everyone for attending the meeting and adjourned the meeting.

## Appendix A: List of Attendees

| Name | | Affiliation |
|---|---|---|
| David | Ackerman | City of Norwalk |
| Cathy | Alexander | Ohio EPA |
| Tony | Anderson | Fayette County |
| Thomas | Angelo | Ohio Water Environment Association |
| Larry | Antosch | Ohio Farm Bureau Federation |
| Mohammad | Asasi | OEPA |
| Robert | Ashton | City of Columbus, Ohio |
| David | Ashworth | Novozymes |
| Michael | Bailey | ODNR- DSWR |
| Doug | Bailey | Greene SWCD |
| Barbara | Baker | NRCS |
| Russell | Bales | City of Lima |
| Kiah | Barrette | Hull & Associates, Inc. |
| Tadd | Barrow | HAB Aquatic Solutions |
| Dick | Bartz | USGS - OH WSC |
| David | Battocletti | Ice Miller Whiteboard |
| Chuck | Bauer | Clark County Utilities |
| Gene | Baumgardner | Ohio Corn Marketing Program |
| Sarah | Becker | Ohio EPA |
| Joe | Beiler | Vantilburg Farms Inc |
| James | Belt | Ohio Department of Agriculture |
| Jim | Bennett | ODNR-DOE |
| Sandy | Bihn | Lake Erie Waterkeeper Inc. |
| Greg | Binder | Northeast Ohio Regional Sewer District |
| Richard | Bitonte | Public Sector Advisors |
| Dax | Blake | City of Columbus, Public Utilities |
| Tracy | Bleim | ODNR |
| Lyle | Bloom | Clermont County |
| Ted | Boggs | Vorys Law Firm |
| Robert | Bonnett | NE Ohio Regional Sewer District |
| Paul | Braasch | Clermont County |
| Paul | Brakhage | HAB Aquatic Solutions |
| Don | Breece | OSU Extension |
| Thomas | Bridgeman | Lake Erie Center, U. Toledo |
| Cindy | Brookes | Sandusky River Watershed Coalition |
| Bob | Brown | City of Kent |
| Larry | Brown | Ohio State University |
| Randy | Bruback | City of Painesville |
| Nicholas | Bucurel | Brown and Caldwell |

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|---|---|---|
| Cheri | Budzynski | Shumaker, Loop & Kendrick |
| Walt | Burd | Town & Country Co-op |
| Bonnie | Buthker | Ohio EPA/SWDO |
| Dan | Button | U.S. Geological Survey |
| Kasey | Carlisle | Industrial Fluid Management |
| Karen | Chapman | EDF |
| Vui | Chung | Burgess & Niple |
| Chris | Clark | Logan County WPC District |
| Doug | Clark | OWEA |
| Daniel | Coleman | O'Brien & Gere |
| Remegio | Confesor | Heidelberg University |
| Brian | Cook | Ohio EPA |
| Anne | Cook | The Andersons, Inc. |
| Jared | Coppess | Darke SWCD |
| Terry | Cosby | USDA NRCS |
| Ed | Crawford | DNR-DSWR |
| Ed | Cross | Blue Stone Solutions, Ltd |
| Diane | Cross | Blue Stone Solutions, Ltd |
| Brenna | Cross | Blue Stone Solutions, Ltd |
| Don | Daniels | Town & Country Co-op |
| David | Daniels | ODA |
| Steve | Davis | USDA-NRCS |
| Jessica | DeMonte | Squire Sanders (US) LLP |
| Jeff | DeShon | Ohio EPA |
| jim | dieter | Medina County SWCD |
| Janina | Douglas | Lake Erie Improvement Association |
| Bob | Doyle | Public Sector Advisor's |
| Dianna | Doyle | Public Sector Advisors |
| Mary Ann | Driscoll | RW Armstrong |
| Dan | Dudley | DSW, Ohio EPA |
| Rod | Dunn | City of Columbus - Power and Water |
| Michael | Dunn | Indiana Soybean Alliance |
| Rick | Eberle | Avon Lake Municipal Utilities |
| Michael | Eggert | Ohio EPA |
| Mike | Ekberg | Miami Conservancy District |
| Jacob | Elder | Cox-Colvin &Associates |
| Kevin | Elder | Ohio Department of Agriculture |
| Joe | Elliott | City of Painesville |
| George | Elmaraghy | DSW, Ohio EPA |
| Kurt | Erichsen | TMACOG |
| Edward | Ewbank | Metropolitan Sewer District of Greater Cincinnati |
| Bill | Fischbein | Ohio EPA |
| Fisher | Rebecca | Tetra Tech |

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|---|---|---|
| Frank | Foley | NEORSD |
| Tom | Fontana | Ohio Soybean Council |
| Jessica | Fox | EPRI |
| Tom | Frank | Ohio Waste Haulers Ass. |
| Tracy | Freeman | Ohio EPA |
| Don | Freisthler | City of Piqua |
| Kelly | Frey | Ottawa County |
| Jennifer | Frommer | HDR Engineering |
| Kristin | Gardner | Hull & Associates, Inc. |
| Paul | Gledhill | Ohio EPA |
| Dan | Glomski | Ohio EPA |
| Hannah | Gonzalez | Clermont County Ohio |
| Eric | Gorczynski | City of Kent |
| Frank | Greenland | Northeast Ohio Regional Sewer District |
| Joshua | Griffin | Ohio EPA |
| Timothy | Griffith | Baltic Water Works |
| John | Grosse | Stantec |
| Hans | Gucker | Ohio Department of Transportation |
| Dusty | Hall | SOCHE |
| Brian | Hall | Ohio EPA |
| Fred | Hammon | ODNR |
| Erica | Hawkins | ODA |
| Dan | Helmick | Ice Miller Whiteboard |
| Jocelyn | Henderson | ODNR-DSWR |
| Ron | Hendrick | The Ohio State University |
| Christopher | Henney | Ohio AgriBusineses Association |
| Judi | Henrich | Ohio Water Environment Association |
| Tim | Henry | Region 5 EPA |
| Gail | Hesse | Lake Erie Commission |
| Charlotte | Hickcox | Ohio Chamber of Commerce |
| Kirk | Hines | ODNR-DSWR |
| Sarah | Hippensteel Hall | Miami Conservancy District |
| Adam | Hoff | Stantec |
| Breann | Hohman | Erie SWCD |
| Tom | Holmes | ODNR-DSWR |
| John | Holz | HAB Aquatic Solutions |
| Eugene | Homan | Small Grain Marketing Board |
| Brent | Hostetler | Ohio Corn & Wheat Growers Association |
| Seth | Hothem | Northeast Ohio Regional Sewer District |
| Craig | Houin | Sunrise Cooperative |
| Jacob | Howdyshell | Ohio EPA |
| Becky | Humphreys | ODOT |
| Jack | Irvin | Ohio Corn & Wheat Growers Association |

| | | |
|---|---|---|
| Ronald | Jenkins | (none provided) |
| Kevin | Johnston | FARES |
| Belinda | Jones | Capiton Consulting |
| Anne | Kaup-Fett | Clark County Combined Health District |
| Denise | King | Farmland Preservation/ODA |
| Kevin | King | USDA-ARS |
| Amy | Klei | Ohio EPA |
| Dale | Kocarek | Stantec |
| Mark | Koch | MillerCoors |
| Dana | Koppes | New Energy Systems |
| Kevin | Krejny | Mont. Co. Environmental Services |
| Kenneth | Krieger | National Center for Water Quality Research, Heidelberg University |
| Lorraine | Krzyzewski | City of Columbus Watershed Management |
| Kristen | Kubitza | Ohio Environmental Council |
| Allison | Kunze | U.S. Geological Survey |
| Tom | Kutcher | MSD of Greater Cincinnati |
| Greg | LaBarge | Ohio State University Extension |
| William | Landshof | RW Armstrong |
| Brian | Laurent | Ohio Turfgrass Foundation |
| Don | Leeds | Greene SWCD |
| Michelle | Leitzy | FrazierHeiby |
| Lauren | Lindemann | TNC |
| Matthew | Lindsay | Miami Valley Regional Planning Commission |
| Keith | Linn | Cuyahoga SWCD |
| Ryan | Lippe | FrazierHeiby |
| Joe | Logan | Ohio Environmental Council |
| Tony | Logan | USDA, Rural Development |
| Gary | Marshall | City of Dayton |
| Greg | McGlinch | Darke SWCD |
| Kim | McGreal | Cleveland Airport System |
| Dj | Mears | Lucas SWCD |
| Bill | Meinert | O'Brien & Gere |
| Thomas | Menke | Menke Consulting, Inc. |
| Vince | Messerly | Ohio Wetlands Foundation |
| Kristy | Meyer | Ohio Environmental Council |
| Milton | Miller | Grand Lake St Mary's Restoration Commission |
| Brad | Moffitt | Ohio Corn & Wheat Growers Association |
| Richard | Moore | OSU |
| Michael | Morrow | Advanced Drainage Systems, Inc. |
| Bob | Mulligan | ODNR - DSWR |
| Ziad | Musallam | Fulton County |
| Shannon | Nabors | Ohio EPA |
| Scott | Nally | Ohio EPA |

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|---|---|---|
| Joe | Nester | Nester Ag. LLC |
| Paul | Novak | Ohio EPA |
| John | Oster | Morral Companies, LLC |
| Ed | Pelton | Pelton Environmental |
| Gary | Pennell | EDF |
| Aaron | Pennington | Ohio EPA SEDO |
| Matt | Perlik | ODOT |
| Scott | Phipps | Hazen and Sawyer |
| Keith | Radick | CT Consultants |
| Kevin | Rapp | Advanced Drainage Systems |
| mandy | razzano | Ohio EPA |
| Richard | Reed | CTI Engineers, Inc. |
| Nick | Renner | Mercer, Soil and Water |
| Jeff | Reutter | Ohio Sea Grant & Stone Lab |
| Dean | Reynolds | City of Alliance |
| Kimberly | Rhoads | Ohio EPA |
| R. Peter | Richards | Heidelberg University |
| Gene | Roberts | City of Kent |
| Ronald | Rockhold | Southwest Corn Growers |
| Debora | Roth | Ohio EPA, SWDO |
| Dave | Russell | Brownfield Ag Network. |
| Caitlin | Ruza | Ohio EPA |
| Eric | Saas | Ohio EPA |
| Adam | Sackenheim | Butler County Water & Sewer |
| Rick | Schaffer | Norwalk WTP |
| Francine | Scharver | Lake County General Health District |
| Sky | Schelle | City of Springfield |
| John | Schlichter | Ohio Department of Agriculture |
| Brian | Schultz | City of Sidney |
| Judith | Scott | City of Mount Vernon |
| David | Sever | Sever Consulting, LLC |
| Michael | Shapiro | Ohio EPA |
| Adam | Sharp | Ohio Farm Bureau Federation |
| Scott | Shearer | OSU, Dept. of Food, Agricultural and Biological Engineering |
| Saa | Shemsu | Montgomery County |
| Peter | Simcic | Ohio EPA |
| Mark | Smith | USDA-NRCS |
| Gregory | Smith | OHIO EPA DEFA |
| Anne | Sorensen | American Farmland Trust |
| David | Spangler | Lake Erie Waterkeeper |
| Terry | Spiegel | City of Bucyrus |
| Frances | Springer | ODNR |
| Bill | Stanley | The Nature Conservancy |

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|---|---|---|
| Tom | Steib | Elco Corporation |
| Michael | Stinehelfer | CT Consultants |
| Jedediah | Stinner | The Ohio State University |
| Gary | Stuhlfauth | Ohio EPA |
| Sam | Swanson | Burgess & Niple |
| Nancy | Taylor | City of Newark |
| Philip | Teague | Jones and Henry Engineers |
| Peter | Tennant | ORSANCO |
| Peter | Thomas | Coaltec Energy USA, Inc. |
| Jason | Tincu | City of Dayton |
| Barry | Tonning | Tetra Tech |
| Elizabeth | Toot-Levy | Northeast Ohio Regional Sewer District |
| Josh | Trenary | Indiana Pork |
| Jeff | Tressel | City of Painesville |
| Jeff | Van Loon | Medina SWCD |
| Carrie | Vollmer-Sanders | The Nature Conservancy |
| Doug | Wagner | City of Oregon Water |
| Andy | Ward | The Ohio State University |
| Adam | Ward | Ohio Soybean Association |
| Timothy | Weaver | City of Springfield |
| Dale | White | Ohio EPA - Division of Surface Water |
| Elizabeth | Wick | Ohio EPA NWDO |
| Beau | Williams | Cleveland Airport System |
| Mark | Wilson | Land Stewards LLC |
| Howard | Wise | Ohio Department of Agriculture |
| Jon | Witter | Ohio State University |
| Ronald | Wyss | Lake Erie Improvement Association |
| Yang | Xing | OSU |
| Fred | Yoder | Ohio Corn Marketing Program |
| Jim | Zehringer | ODNR |
| Jay | Zollars | New Energy Systems |