

The Ohio Water Table

A Publication of the Water Management Association of Ohio

No. 136 / Quarterly

Record Attendance at the 2015 WMAO Conference

Scott Jerrome, *Natural Resources Conservation Service (NRCS)*

Attended by over 250, the WMAO Fall Conference “*MOVING THE NEEDLE: POLICIES, PROGRAMS, AND PEOPLE THAT DRIVE CHANGE*”, was held November 17 & 18, 2015, at the Doubletree - Columbus Worthington, 175 Hutchinson Ave., Columbus, Ohio.

The keynote address “Ohio State’s Collaborative Effort to Solve Water issues at the Regional and International Level”, given by Marty Kress, framed a new Global Water Initiative led by OSU. Many of the other presentations provided a look at projects that have demonstrated success, technologies that represent new approaches, or research to solve water resource issues. The closing panel session, “Healthy Water Ohio: A Strategy for Water Resource Management” shared recommendations for maintaining and strengthening Ohio’s water resources.



Kimberly Shaffer presents award to Gail Hesse.

The conference offered insight on the water resources issues, programs, and policies that result in meaningful change, provide solutions, Improve accountability, encourage a systems approach, and promote sustainability and resiliency.

We hope you were able to attend this conference and have learned what is driving the change. The Conference Proceeding and other information about the conference is still available on the website at <http://wmao.org/>



Inside this issue:

<i>President's Column</i>	2
<i>In Memoria; Robert Tippet</i>	3
<i>WMAO / OWRC Water Luncheon Seminar</i>	4
<i>Protecting Water Quality on Watershed Scale</i>	5
<i>Research Highlights from Ohio Water Resources</i>	6
<i>Local Engineering Firm, ms consultants, inc., Working in China.</i>	8
<i>Ohio Stormwater Association</i>	10
<i>WMAO / EPN 2016 Spring Meeting</i>	11
<i>Ohio Lake Management Society</i>	12
<i>Nowcasting Cyanobacterial Harmful Algal Blooms in Ohio Lakes</i>	12
<i>Farewell to CLAM Volunteer Richard Bassetti</i>	14
<i>WMAO 2016 Membership Renewal</i>	15
<i>WMAO Board of Directors</i>	16

WMAO Award Recipients

Technician of the Year	Jake Hahn, Clermont SWCD
Ohio Water Hall of Fame	Scott Jackson, USGS
Distinguished Service	Gail Hesse, National Wildlife Federation
Wayne S. Nichols	Michael Eggert, Ohio EPA
ODSO Best Private Dam	Brookside Country Club
ODSO Best Public Dam	Village of Leipsic
OLMS Lifetime Achievement	Dr. David A. Culver, Ohio State University
OLMS President's Award	Dr. Thomas Brideman, University of Toledo

President's Column

Alex Covert, WMAO 2016-2017 President



Welcome to the New Year - a time for new beginnings. Yes, it's a bit cliché but, it's also the perfect time to review our successes, pat ourselves on the backs, and plan for the year of the Water Buffalo (2016 is actually the Chinese Year of the Monkey but, I couldn't relate that back to WMAO... or at least, I didn't want to).

As a very brief introduction: ~~I'm an extroverted introvert who enjoys water and walks on the beach.~~ Perhaps more relevant, I've been a biologist at the U.S. Geological Survey in Columbus, Ohio for about 20 years – collecting and modeling fish, macroinvertebrates, water-quality, and habitat data.

Thanks for giving me the opportunity to help lead the Water Management Association of Ohio. Like many who have been active in WMAO, the story of how they got involved is always the same... a more senior colleague retired and they missed a meeting where their name somehow made the shortlist for "filling in." All kidding aside, though, I am thrilled to be a part of such an amazing organization. I have found great satisfaction and made numerous professional contacts in working on the WMAO Conference Planning Committee and the WMAO Board. I hope that I can contribute as much to WMAO as what I've gotten out of it.

"WMAO and our divisions are here to build relationship and provide forums for education..."

Since we last met at the 2015 WMAO Conference in November (see front page), Ohio and Mother Nature have taken us on a weather-related rollercoaster ride. Just a few weeks ago, throngs of runners wearing shorts filled trails throughout Ohio and now, January is bringing us close to single digit temperatures. This is no surprise to anyone who has spent a winter in the Buckeye state. Likewise, the water resources issues in Ohio never stop changing either: from harmful algal blooms to repairing aging water systems and from protecting fish and wildlife habitat to providing adequate water for commerce and industry. This is where the Water Management Association of Ohio can help. WMAO and our divisions are here to build relationships and provide forums for education and discussion of the current water resources issues. We do this through our newsletters, water luncheons, workshops, annual conferences, and other networking events. This is what WMAO does and plans to continue doing in the coming year.

As we say goodbye to 2015, I would like to thank all of those who have helped with WMAO's success in the past year: the WMAO Board members (list on page 16), our Administrative Director (Dana Oleskiewicz), the WMAO Divisions, our generous conference/newsletter sponsors, and finally, the WMAO membership. We exist for and because of these people.



Civil & Environmental Consultants, Inc.

- ▶ Geotechnical Engineering
- ▶ Dam Safety Engineering
- ▶ Water Resources
- ▶ Surveying Services
- ▶ Construction Materials Testing
- ▶ Environmental Services

Contact:
Matt Gramza, P.E., CFM
mgramza@cecinc.com
800-759-5614

Ohio Offices:
Cincinnati, Columbus, Toledo

www.cecinc.com
locations nationwide

I wish WMAO members all the best in their water resources endeavors in 2016 and look forward to serving as President of the Water Management Association of Ohio.

S. Alex. Covert



Scott Jackson, winner of the Ohio Water Hall of Fame.



Conference Student Networking Event brought together professionals and students to discuss career opportunities.

HARMFUL ALGAL BLOOM TESTING & BEYOND

Wetland & Stream Management

24-HR Turnaround Analysis

Comprehensive Monitoring Plans

DIY Sampling Kits

Stormwater Management

Environmental Compliance

STAY ON TOP of Ohio EPA Regulations.

24-HR CYANOTOXIN TESTING

- Microcystin LR, Anatoxin-a, Saxitoxin & Cylindrospermopsin Testing by ELISA Methods
- DIY Sampling Kits with Prepaid Shipping
- Phytoplankton & Periphyton Identification & Quantification
- Qualitative Scans for Potentially Toxic Cyanobacteria
- Algal Biovolume Measurements

OTHER LABORATORY & ANALYSIS SERVICES

- WET Testing
- TIE/TRE Testing
- WER Testing
- Sediment Testing

ECOLOGICAL SERVICES

- Wetland & Stream Management
- Stormwater Management
- Environmental Compliance
- Environmental Permitting



Call today for a quote! **800.940.4025**
EnviroScienceInc.com
info@EnviroScienceInc.com

In Memoria

Robert H. Tippet, age 96, of Worthington, died November 27, 2015. Robert was born in Cleveland on December 26, 1918 and graduated from Wellston High School in 1935 and The Ohio State University in 1939 as a Civil Engineer. His illustrious career spanned several decades which included many water related projects as an employee of Burgess & Niple. *Robert was a member of The Water Management Association of Ohio and served as president in 1980.*

A Water Luncheon Seminar



► Presented by:

The Water Management Association of Ohio
and
The Ohio Water Resources Center

February 10, 2016; 11:30 a.m. - 1:00 p.m.

Wilma H. Schiermeier Olentangy River Wetland Research Park,
The Heffner Building, 352 Dodridge St. Columbus, OH 43202



From St. Rt. 315, exit east onto Ackerman Rd, continue past Olentangy River Rd onto W. Dodridge St, then left into Park driveway.

Water Supply and the Oil & Gas Industry's Impact within the Muskingum Watershed Conservancy District

Theodore "Ted" Lozier, P.E. MBA, Chief of Conservation and **John Watkins**, P.E., C.F.M.,
Conservation Engineer, Muskingum Watershed Conservancy District.

A portion of the Muskingum River watershed has been very active with Utica Shale oil and gas drilling and development. Water resources are a key component for the drilling and completion activities associated with the wells. The Muskingum Watershed Conservancy District (MWCD) has implemented policies and procedures for the sustainable use of water from some of its reservoirs by the drilling industry. This presentation will provide an overview of the water supply demands, the MWCD policies and procedures for supplying water, and water withdrawal from the various reservoirs over the past few years.

Please register by February 5, 2015. Late or on-site registrations cost \$5 extra and are not guaranteed a meal. For registered engineers who need Professional Development Hours (PDHs), this presentation offers 1 PDH.

☐ WMAO Member (\$15) ☐ Nonmember (\$18) ☐ Student (\$7) Special meal? _____

Name _____

Organization _____

Address _____

City _____ State _____ Zip _____

Phone _____ Email _____

Please send form and check to: WMAO-Luncheon, 8584 E. Washington St. #206, Chagrin Falls OH 44023.

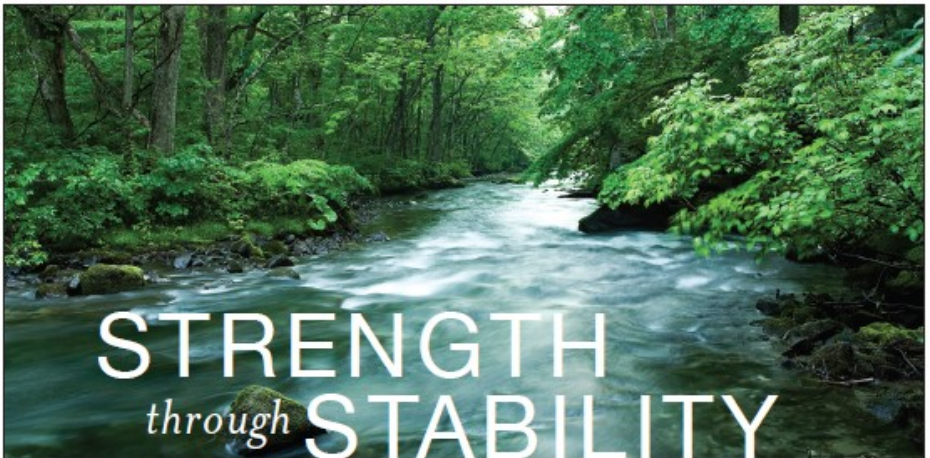
OR, register online with a credit card at: www.wmao.org

Proceeds from the luncheon benefit the continued operation of WMAO and our scholarships. Sponsorship opportunities are available for those interested in providing extra support. More information on sponsorship is available at www.wmao.org

Protecting Water Quality on a Watershed Scale

By **Amy Cameron**, Warren Soil and Water Conservation District

The battle to achieve and maintain healthy rivers and streams is an ongoing effort in the world of natural resource advocates. Conservation projects aimed at promoting and protecting water quality are typically implemented on a political jurisdiction effort, such as a township, city or county, spreading out water quality projects opposed to allowing the projects to work together. Taking a watershed scale approach to restoration and protection allows for a more efficient approach to address water quality issues, improved collaboration and stakeholder involvement, and local support. To better address impairments in the Great Miami River, fourteen Ohio counties have come together to form the Miami River Joint Board of Supervisors to serve as an instrument for watershed scale conservation planning in the Great Miami River Watershed. For the past three years, the Joint Board has been working with Miami Conservancy District and waste water treatment plants to carry out nutrient credit trading in the Great Miami River Watershed, to help decrease nutrients in the Great Miami River. At a recent Joint Board meeting, it was voted to expand the Board's mission beyond nutrient credit trading. This vote allows the Joint Board to plan and prioritize water quality projects throughout the entire watershed. The Joint Board will seek out grant funding to work with landowners and other partners to plan restoration and protection projects throughout the Great Miami River Watershed, to improve the quality of the Great Miami River. Warren County SWCD will continue to provide updates as projects develop.



YOU DESERVE MORE

Davey Resource Group is rooted in decades of experience. Our highly qualified team of biologists, restoration ecologists, environmental planners and regulatory specialists are trained to respond to your needs by providing resourceful services and innovative solutions.

John Kusnier / *Project Developer*
800.828.8312 x8059 (office)
419.787.4153 (mobile)
John.Kusnier@davey.com



Research Highlights from State of Ohio Water Resources Center

Seated at The Ohio State University, the Ohio Water Resources Center is a federally appointed water resources center for the State of Ohio. Our aim is to promote water-related research, education, and outreach for Ohio's water resources issues. Below are highlights of a recently funded project from Dr. Suresh Sharma, Assistant Professor in the Civil and Environmental Engineering Program at Youngstown State University. If you are interested learning more about our research projects see the Ohio Water Resources Center webpage at wrc.osu.edu

The overall objective of Dr. Sharma's project titled "**Scenario Analysis for the Impact of Hydraulic Fracturing on Stream Low Flows and Water Supplies: A Case Study of Muskingum Watershed in Eastern Ohio**" is to evaluate the capacities of smaller

...planners and decision makers should consider water withdrawal for fracking while setting environmental flow criteria....

streams for withdrawal permitting and water resources availability at various spatial and temporal scales. Soil and Water Assessment Tool (SWAT) was validated on USGS gauged streams and scenarios comparison was done for the Muskingum Watershed (Figure 1). Baseline scenario was based on the realistic conditions of all water use data, excluding hydraulic fracking water use. Similarly, current scenario was based on the real data of water use in the Muskingum watershed including current water withdrawal conditions for hydraulic fracking. The future scenario was modeled using 30 years of generated climate data based on historical precipitation. Seven day minimum monthly flows showed large variability when compared with and without fracking, indicating that flow alteration during low flow period will be more critical than average flow or peak flow period (Figure 2).

A significant change in the seven day minimum flows was detected among baseline, current and future scenarios, especially in the first order stream. Furthermore, the future scenario showed that water withdrawal due to hydraulic fracking had localized impact, especially during low flow period. More importantly, the flow alteration due to hydraulic fracking decreased with increase in the drainage area. The modeling results suggests that planners and decision makers should consider water withdrawal for fracking while setting environmental flow criteria in NPDES permitting for this specific region.

Researcher Profile: Dr. Suresh Sharma is interested in complex hydrologic and water quality modeling using various types of data driven, conceptual, physically based and distributed and semi-distributed watershed models in climate change/variability context. Currently, Dr. Sharma is working in a research related with hydraulic fracking and its impact on water resources, early flood warning system, and sediment and nutrient loading reduction due to bioenergy crop implementation.



Figure 1: Dr. Sharma's graduate student modeling different scenarios

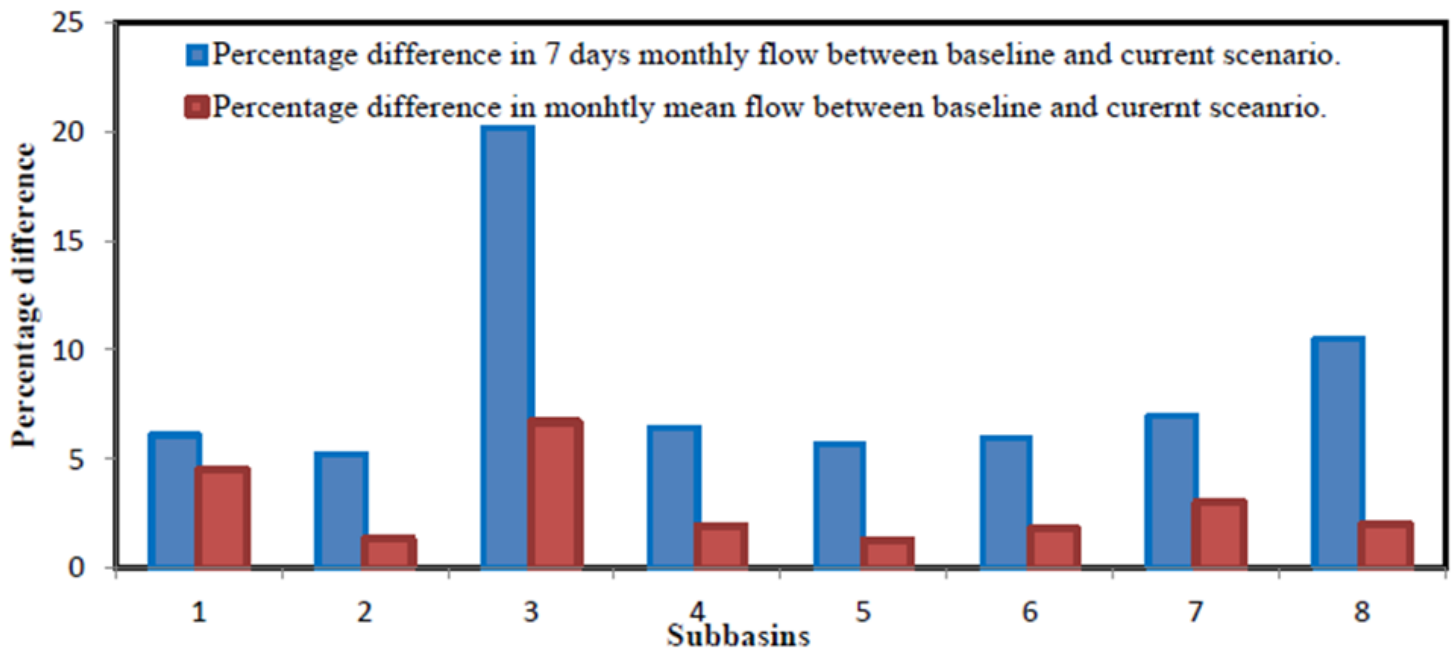




Figure 2. Percentage differences of seven day minimum monthly flow and monthly mean between baseline (without hydraulic fracking) and current scenario on eight subbasins of Muskingum Watershed currently affected by shale gas development.

Excellence in Water Resources




Gannett Fleming
Engineers and Architects, P.C.
*Excellence Delivered **As Promised***

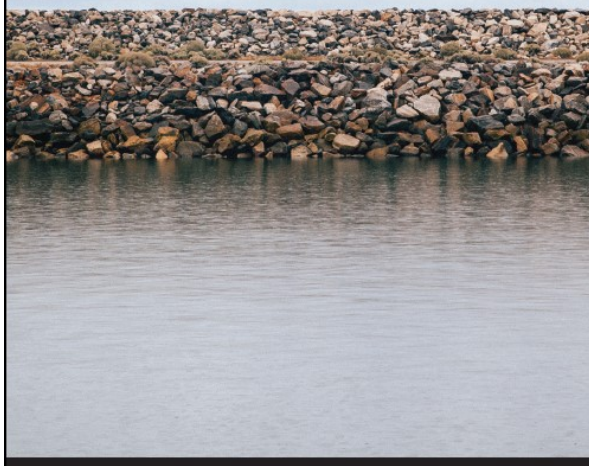
Water/Wastewater • Stormwater • Green Infrastructure
 Hydrologic and Hydraulic Studies • Emergency Action Plans
 Dam Safety Inspection and Design • Environmental
 Civil and Geotechnical Engineering • Wetland Mitigation
 Transportation • GIS

Offices in Columbus and Akron, Ohio
 Daniel Goncz, PE • 614.794.9424
 dgoncz@gfnet.com • www.gannettfleming.com

ISO 9001:2008
 CERTIFIED

PURE

engineering results



ftch

Fishbeck, Thompson, Carr & Huber, Inc.
 engineers | scientists | architects | constructors
 Columbus | Cincinnati | 800.456.3824 | ftch.com

in [t](#) [w](#) [f](#) [i](#)

Local Engineering Firm, ms consultants, inc., Working in China

A Background on Sponge Cities



Flooding in Shanghai; Credit: Stefan Krasowski

Chinese cities are suffering from catastrophic floods, as well as nuisance floods that disrupt their daily lives. A quick Google search can lead to striking images of floating cars on the streets in big cities such as Beijing and Shanghai.

Experts say that climate change has played a role in the increase of urban flooding, producing more rainfall during shorter periods. To make matters worse, rapid urbanization has outpaced stormwater removal. Although China's drainage networks were extended to reach 288,838 miles as of 2013, it still can't catch up with the fast expansion of Chinese cities.

In contrast, many Chinese cities face an extreme water shortage. Of the 657 cities assessed by the Ministry of Housing and Urban-Rural Development (MOHURD), about half are considered water scarce or severely water scarce.

While the need to confront both water shortages and urban flooding has created a huge headache for Chinese city planners, it has also created the opportunity to introduce new and innovative urban design. Known as “sponge cities,” this new urban design aims to build up infrastructure to collect excess rainfall and integrate flood control. As a result, cities will not only be able to deal with too much water but will also be able to reuse rainwater to ease their thirst during water scarcity.

While the buildup of sponge cities does not mean the end of constructing gray infrastructure—a term used by urban planners to describe street gutters, storm sewers and other traditional methods of dealing with rainwater—experts say that it does reduce demand on costly drainage systems.

The concept of sponge cities became so popular in China that it caught the eye of the Chinese President, Xi Jinping in 2013. At that time, President Xi spoke to urban planners and called for strengthening the development of sponge cities to push this initiative.

Expanding on President Xi's commitment, the Chinese central government pledged to provide billions of dollars in funding assistance over the next three years, in an effort to help 16 pilot cities morph into “urban sponges.” In addition to the selected pilots, other cities in China have also carried out their own experiments.

Also, a project of such scale requires the collaboration of many entities. The buildup of sponge cities requires cooperation among engineers, landscape designers, road builders, drainage solution providers and many others. With so many areas of expertise involved, it is



Channelized river in Shenzhen, China



Rapid expansion in Shenzhen, China

difficult to get different authorities to agree on the same approach. According to leadership, China needs sponge cities badly, but scaling up remains brings a number of challenges. For one, although a technical guidance document was issued by the country last year, it is far from enough support and guidance for Chinese urban planners to implement the initiatives within each sponge city.

Another issue is the massive amount of existing infrastructure. With hundreds of cities that have already been built in China, providing a solution that successfully integrates a new urban design with an existing infrastructure poses another troublesome question.

To accomplish their goal, China has enlisted experts in the field. ms is collaborating directly with an engineering firm that is based in Shenzhen, China and has offices in Chicago, Illinois. ms is an integral part of their team to pursue green infrastructure work in China. The expertise that ms is providing includes:

- Green Infrastructure and LID Planning
- Stormwater Management and BMPs
- Green Infrastructure Modeling
- Green Infrastructure Design and Implementation
- Landscape design
- Ecological Restoration
- Water Quality Management and Modeling
- RTC, storm alarm system, stormwater facility control and management



Future green infrastructure demonstration site

ms consultants, inc. is a multidiscipline engineering, architecture, and planning firm for the transportation, environmental, architecture, commercial, sustainability, railroad, and construction industries. Founded in 1963, ms is now in its second generation of family ownership. Today, the firm has nearly 400 employees among nine offices in Indiana, North Carolina, Ohio, Pennsylvania, and West Virginia. Ohio offices include Columbus, Youngstown, and Akron. ms consistently ranks as one of the “Top 500 Design Firms” by Engineering News-Record and was named a “Top 300 Architectural Firm” by Architectural Record.

To read more on the work in China, visit msconsultants.com/sponge-cities.

SPONGE CITIES



Details on China's sponge cities are from the following article:
Coco Liu, "Extreme Weather: China bets on 'sponge cities' to cope with flooding and drought," ClimateWire, Jun 16, 2015.



Ohio Stormwater Association in 2016

Harry Stark, OSWA President

As President of the Ohio Stormwater Association (OSWA), I am excited for 2016. I have been with the OSWA for seven years, and during this time, we have had much to be happy about. This year, though, I am truly excited about the changes and programs we are developing and moving forward with.

The OSWA has a newer Board of Directors who have made an immediate impact to the organizations growth and renewal. Starting in 2016, the OSWA will begin to have more of a presence. We will be hosting and sponsoring a number of workshops throughout the state on specific stormwater management information. We have redesigned our website to make it more user friendly with more pertinent information and this website will be live starting sometime in January. We will be sending out a monthly newsletter with updates on information and educational opportunities throughout the state. We have an agreement with Envirocert International that any educational program we put on will meet their certification continuing educational requirements.

This year marks the ninth annual Ohio Stormwater Conference. OSWA works with the Tinker's Creek Watershed Partners in putting this event on. It will be held May 4-6, 2016 at the Sharonville Convention Center. This annual conference has grown to over 700 attendees and has become the largest regional stormwater conference in the United States. I appreciate all the support we have received over the years with this event and we will continue to provide an event that has the information that you want to see.

I truly am blessed to be able to work with a great Board of Directors and individuals from around the state who are passionate and knowledgeable about stormwater management. 2016 is going to be a great year for the OSWA and I hope you can be part of our organization.

This (OSWA) annual conference has grown to over 700 attendees and has become the largest regional stormwater conference in the United States.



WMAO 2016 Spring Meeting

In Partnership with Environmental Professionals Network

One Water, Ohio Future: Securing A Sustainable Water Future for All
by **Radhika Fox**, US Water Alliance

Healthy Water Ohio - A Strategy for Water Resource Management
by **Larry Antosch**, Ohio Farm Bureau

Blueprint Columbus - Clean Streams, Strong Neighborhoods
by **Susan Ashbrook**, Columbus Dept. of Public Utilities

March 8th, 2016, 7:30 a.m. to Noon

**Nationwide and Ohio Farm Bureau 4-H Center
2201 Fred Taylor Dr., OSU Campus, Columbus**

To view full schedule and abstracts, visit:

<http://wmao.org/2016/01/wmao-2016-spring-meeting/>

Register by invoice or credit card, visit: www.wmao.org





Nowcasting Cyanobacterial Harmful Algal Blooms in Ohio Lakes

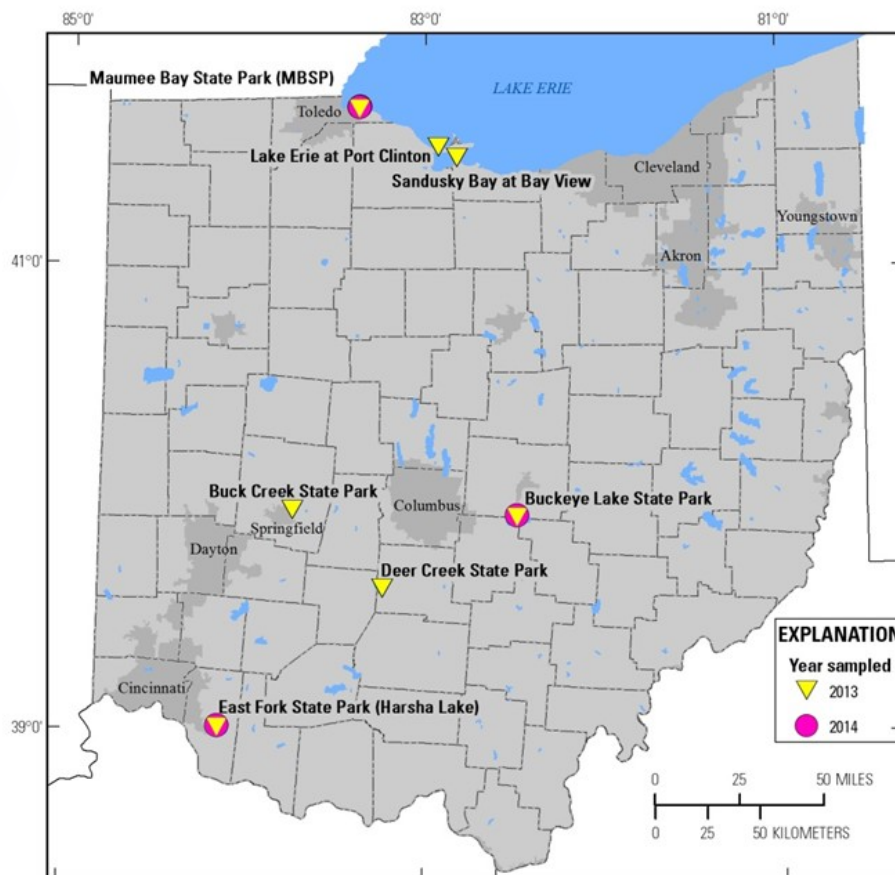
By **Donna Francy**, USGS

Predicting the occurrence of cyanobacterial harmful algal blooms (cyanoHABs) and associated toxins, such as microcystin, is an important goal for public health protection. A study led by the U.S. Geological Survey (USGS) was done at seven recreational areas in Ohio during 2013-14 to identify factors that could be used to develop models to predict microcystin concentrations. Water quality and environmental measurements were used to identify the potential for a system to quickly estimate microcystin levels and provide advisories to swimmers and boaters. This type of system has been used at Lake Erie beaches as part of the Ohio Nowcast (www.ohionowcast.info) for predicting *E. coli* concentrations, but has not been tested for cyanoHABs.

Samples were collected monthly in 2013 at eight sites in seven recreational areas (**see map on next page**) to facilitate an initial assessment and aid in selection of sites for more intensive sampling in 2014. At four sites, weekly samples were collected in 2014 and a more in-depth data analysis was done to identify factors for two different modeling scenarios: (1) Real-time models that included easily- or continuously-measured factors and available environmental data that do not require sample collection and (2) comprehensive models that use results from discrete samples analyzed in a laboratory along with real-time factors. The sites included Maumee Bay State Park Lake Erie beach, Buckeye Lake Onion Island boater/swim area, Buckeye Lake Fairfield Beach, and East Fork State Park beach (Harsha Lake). For real-time models, statistically significant correlations were found between microcystin concentrations and environmental factors including phycocyanin, turbidity, pH, inflow, and lake level change. Continuous water-quality measurements over 3–14 days up to the date of sample collection showed the highest correlations to microcystin concentrations; these data were available at Maumee Bay State Park Lake Erie beach and at Harsha Lake. For comprehensive models, statistically significant correlations were found between microcystin concentrations and laboratory-measured factors including nutrient constituents, cyanobacterial genes (molecular methods), and measures of cyanobacterial biovolume or abundance. The relations between these factors and microcystin concentrations were site specific and even differed at the same site depending on whether data were continuously or discretely measured. Models with high R^2 values (0.82–0.91), 100% sensitivities, and high specificities 91–96%) were developed for Maumee Bay State Park Lake Erie beach for predicting microcystin concentrations above or below the Ohio Recreational Public Health Advisory level of 6 µg/L.

Water quality and environmental measurements were used to identify the potential for a system to quickly estimate microcystin levels.....

A new study planned for 2016 will be done to develop site-specific models to use in a cyanoHAB nowcast. The study will include more frequent data collection on several consecutive days each week before, during, and after the cyanoHAB season at Maumee Bay State Park Lake Erie beach, at an inland lake site, and at two drinking-water plant intakes.



Base modified from
 Ohio Department of Transportation
 1:24,000-scale digital data

The USGS study at seven recreational sites was done in cooperation with Ohio Water Development Authority, University of Toledo, Clermont County Soil and Water Conservation District, Erie County General Health District, Ohio Department of Natural Resources, Ohio Environmental Protection Agency, and the U.S. Environmental Protection Agency. The report, "Water Quality, Cyanobacteria, and Environmental Factors and Their Relations to Microcystin Concentrations for Use in Predictive Models at Ohio Lake Erie and Inland Lake Recreational Sites, 2013-14," is available at <http://pubs.er.usgs.gov/publication/sir20155120>.



BSA

ENVIRONMENTAL SERVICES, INC.



Over 20 years of Superior Aquatic Microbiology Services!

- Phytoplankton Identification
- Biovolume & Biomass
- Chlorophyll Analyses
- Algal Systematics
- Cyanotoxin Analyses
ELISA & HPLC

- Epifluorescence Microscopy
- Microphotography
- Taste & Odor Algae
- Vouchers (Slides/Digital)
- Express Service Available










Contact us today for additional information or a quotation!

216-765-0582 • 23400 Mercantile Rd. #8, Beachwood, OH 44122 • www.bsaenv.com

In Recognition and A Hearty Farewell

The Citizen Lake Awareness and Monitoring (CLAM) Program, on behalf of the Ohio Lake Management Society, would like to offer our best wishes to **Richard Bassetti**. Rich has been a CLAM volunteer since 2008. Under a grant project with the Muskingum Watershed Conservancy District (MWCD), he took on the extra duties, in addition to measuring water transparency, to collect water samples at Atwood Lake to monitor for Harmful Algal Blooms. His contribution to the CLAM program has been much appreciated.

An excerpt from his resignation letter embodies the passion that he brought to our efforts:

“I have loved water ever since my early years fishing Atwood, Tappan, Clendening, Leesville and Piedmont Lakes. Atwood was extra special because I had several different jobs during my college years ranging from Lake Patrol, to gate monitor, to mowing, trimming pine tree plantations owned by MWCD...”

Richard, thank you for your many years of service. You will be missed!



AQUA DOC

Complete Lake & Pond Management

- Customized Algae & Weed Treatment Programs
- Award Winning Waterscape Design & Installation
- Biologists, Aquatic Specialists on Staff
- Serving All Ohio Waters Since 1983



Free Consultations – Call Today!

440-286-7663 or Toll Free 800-689-5253

10779 Mayfield Road Chardon, Ohio 44024
www.aquadocinc.com

Most Major Credit Cards Accepted

WMAO is poised to do great things in 2016. Join us in our water protection efforts as a WMAO member. Renewal notices will be sent out shortly. Beat the rush. Renew today at:

www.wmao.org.



Five Divisions;

- *Ohio Dam Safety Organization*
- *Ohio Floodplain Management Association*
- *Ohio Lake Management Society*
- *Ohio Stormwater Association*
- *Ohio Watershed Professionals Association*

**Working within twelve interests areas;
One Incredible Organization!**



Join your colleagues in supporting the only statewide group dedicated to protecting ALL Ohio water resources. Membership benefits can be found at:

<http://wmao.org/join-wmao/>

Water Management Association of Ohio

www.wmao.org * admin@wmao.org * 330-466-5631

WATER MANAGEMENT ASSOCIATION OF OHIO

8584 E. Washington St. #206
Chagrin Falls, OH 44023

330-466-5631, admin@wmao.org
Dana Oleskiewicz, Administrative Director

www.wmao.org

The Water Management Association of Ohio (WMAO) is the one organization dedicated to all of Ohio's water resources.

VISION: The Water Management Association of Ohio will be the most effective and respected independent water resources organization in Ohio.

MISSION: The Water Management Association of Ohio promotes the comprehensive understanding, conservation and multifaceted use of Ohio's water resources.

Permission to reprint with credit to WMAO.



2016 WMAO Board of Directors

Alex Covert	sacovert@usgs.gov
Joe Bonnell	bonnell.8@osu.edu
Boris Slogar	bslogar@mwcd.org
Gregory Nageotte	greg.nageotte@agri.ohio.gov
Stuart Ravary	stuartravary@stoneenvironmental.com
Tim Howdyshell	thowdyshell@aep.com
Shawn Arden	sarden@emht.com
Darren Bade	dbade@kent.edu
Mark McCabe	mark_mccabe@gspnet.com
Stephanie Singer	ssinger@defiance-county.com
Larry Antosch	lantosch@ofbf.org
Eugene C. Braig IV	braig.1@osu.edu
Craig Smith	craig.smith@epa.ohio.gov
Scot Hindall	scot.hindall@dnr.state.oh.us
John Hoopingarner	jhoopingarner@mwcd.org
John Lenhart	lenhart.49@osu.edu
Jim Shoemaker	james.shoemaker@daytonohio.gov
Kari Mackenbach	kmackenbach@msconsultants.com
John Herchl	herchljf@cdmsmith.com
Tom Allen	ptallen111@insight.rr.com

President
Vice President
Past President
Treasurer
Secretary
Division Director—Dam Safety (ODSO)
Division Director—Floodplain Management (OFMA)
Division Director—Lake Management (OLMS)
Division Director—Stormwater Management (OWSA)
Division Director—Watershed Management (OWPA)
Director—Agriculture
Director—Education
Director—Groundwater
Director—Mineral Resources Management
Director—Navigation & Recreation
Director—Research & Data Management
Director—Water & Wastewater
Director-at-Large
Director-at-Large
Director-at-Large

