

# The Ohio Water Table

A Publication of the Water Management Association of Ohio

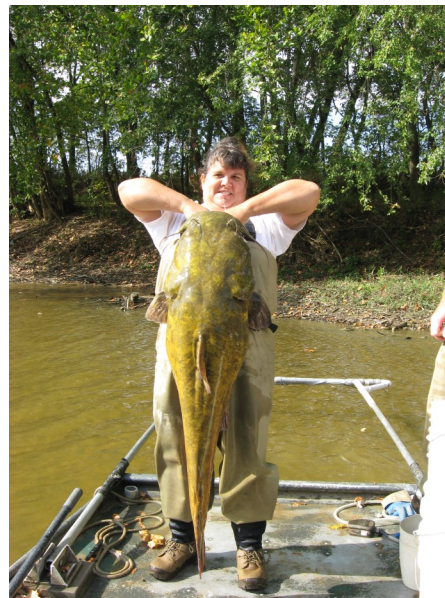
No. 149 / Quarterly

## The Legacy of Water Pollution in Ohio Rivers and Streams and the Advent of Biological Recovery

By **Chris O. Yoder**, Research Director, Midwest Biodiversity Institute



Four co-authors, Ed Rankin, Vickie Gordon, Lon Hersha, and Charles Boucher, and myself will soon have a chapter entitled *Degradation and Recovery of Scioto River (Ohio-USA) Fish Assemblages from Pre-Settlement to Present-Day Conditions* to be published in *From Catastrophe to Recovery: Stories of Fish Management Success*, a book soon to be released by the American Fisheries Society. Our chapter describes the results of a 37 year (1979-2015) series of biological and water quality assessments of the Scioto River in a 40 mile reach of the mainstem from Columbus to Circleville, OH conducted by the Ohio EPA and the Midwest Biodiversity Institute (MBI). We coupled contemporary data with historical information to document the recovery of water and biological quality from severely polluted conditions that had existed for more than a century. The remarkable improvements were the result of Clean Water Act mandated water pollution controls by the City of Columbus in the 1970s and 1980s. Despite the inherent richness of the original fish fauna, the Scioto River downstream from Columbus was so polluted by the summer of 1897 that only a "few species of fish" could be found (Williamson and Osburn 1898). Rapid population growth resulted in sewage flows that continually exceeded the capacity of the sewage system well into the 20th century. Biological degradation occurred over a distance of at least 75 miles downstream and fish kills of 1,000 to 10,000 fish were commonplace and one kill of more than 300,000 fish occurred in 1967. Bypasses of partially treated and raw sewage were frequent and comprised nearly 80% of the sewage system



*A Flathead Catfish, representing one of the species of fish that are getting bigger.*

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## President's Column

**Craig Smith**, WMAO 2018-2019 President

When I sit down to write my column, I feel like I need to cover some deep, philosophical topic of great importance. The reality is I don't have any deep, philosophical truths to share, at least none that are pertinent to water resources. I could write about the Boss and the deep, philosophical meaning of the lyrics to "Growin' Up", but I'd rather do that after hours. It's easier to write about what's on my mind at the moment ...

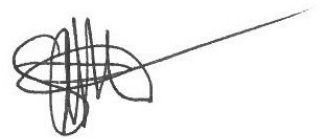
Water was falling from the sky this morning! OMG! From the traffic you'd have thought it's never happened before. And to hear some of the grumbling you'd think the stock market had crashed and everyone's retirement funds were in a shambles. I just grinned.

I don't mind rain as much as I used to. When I worked on leaking underground storage tanks rain was a nuisance. It filled tank cavities; floated empty tanks; and made sites a miserable, muddy mess. Rain washed away contaminated soil and flushed contaminants in storm sewers and surface waters. Rain was bad.

Working on drinking water issues, specifically source water protection, changed my attitude toward rain. And snow for that matter. Rain and snow are good. Rain and snow melt recharge our aquifers and keep our reservoirs full. We need water falling from the sky to ensure that we have adequate supplies for drinking, energy production, agriculture, and recreation.

We've been lucky in that regard – it's been 20 years since we had to contend with a serious drought. The last – at the turn of the century – had much of the state scrambling as reservoir levels dropped, ground water levels declined, and streams ran at very low levels. Fall rains brought relief. And I learned to appreciate rain (and snow).

Perspective is a wonderful thing. Yes, rain can ruin a day out, interfere with a baseball game, make mud puddles our dogs romp in, and slow traffic to a crawl. It also keeps our drinking water supplies plentiful. That's why I was grinning this morning.



## WMAO Scholarship

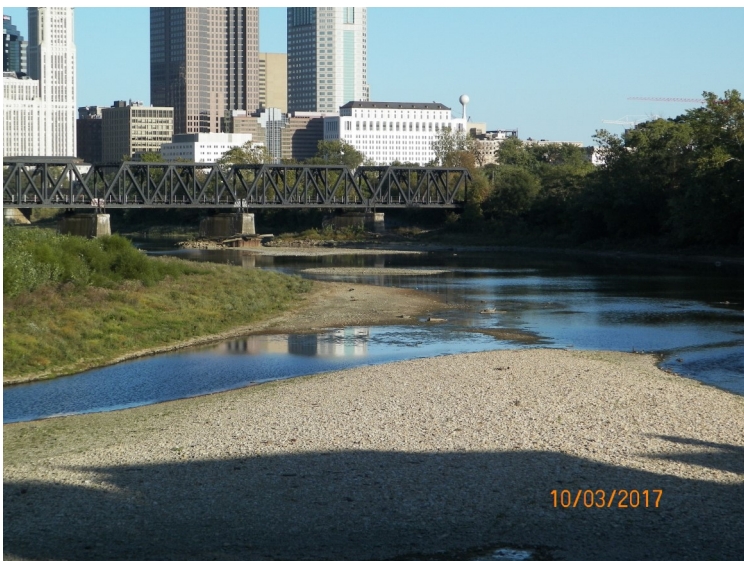
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discharges by the late 1970s. It was during this time period that Milton B. Trautman described visual evidence of gross pollution in the form of “globs of suds” that were more than 5 feet high and which completely enveloped the boat he was using to navigate the Scioto River at that time (Trautman 1977).

The grossly polluted condition of numerous rivers, streams, and lakes finally spurred on the passage of the Federal Water Pollution Control Act amendments of 1972 which was the first federal legislation that required permits limiting the amount of pollution that could be discharged to waters of the U.S. Permits were eventually issued to all significant discharges of municipal and industrial wastewater across Ohio including the two City of Columbus facilities. What became known as “Project 88” was a \$208 million wastewater treatment plant expansion that was then the largest capital improvement program in the history of Columbus. The success of Project 88 was first evident in the substantial reduction in loadings of common wastewater pollutants by July 1, 1988. The series of biological and water quality surveys in the Scioto River during 1979-2015 initially revealed poor biological conditions that were followed by increments of improvement corresponding to intermediate steps taken to reduce the bypassing of untreated sewage in the early 1980s. Further improvements corresponded to the installation of advanced wastewater treatment by Project 88 and as mandated by the National Municipal Policy of 1984. The fish Index of Biotic Integrity (IBI), one of the three indices that comprise the Ohio biological criteria, exemplified these improvements with full attainment of the Warmwater Habitat use designation in the early 1990s. The most recent survey by MBI in 2015 showed full attainment of the Exceptional Warmwater Habitat designation downstream from Big Walnut Creek. By 2015, nearly 70 species of fish had returned to their former habitats in the mainstem and tributaries. Consistent with the improved IBIs, the majority of these species are intolerant or moderately intolerant to pollution while the handful of declining species are highly or moderately tolerant. Among the longer lived species, individual fish have markedly increased in size through this same time period. Just as important was the opening of the mainstem as a route of ingress for intolerant species that formerly inhabited tributaries such as Big Walnut Creek, Alum Creek, and their tributaries. Access to other tributaries such as the Olentangy River is presently precluded by the Greenlawn Dam in downtown Columbus. The improved biological quality has provided for



*Scioto River in downtown Columbus at the Olentangy confluence.*

better recreational opportunities including fishing, hunting, canoeing, and kayaking and the addition of liveries and new public access sites. Perhaps the most important lesson learned is that the CWA mandated reductions in loadings of sewage pollutants resulted in water quality that was good enough to allow for a biological recovery that meets and in some places exceeds the minimum goals of the CWA.

Similar descriptions can be made for numerous other Ohio rivers and streams that received large volumes of poorly or untreated sewage and industrial wastewater. Ever since Ohio EPA began tracking trends about the proportion of rivers and streams that meet Water Quality Standards in the



late 1970s, a consistent trend of improvement has been documented spanning nearly 40 years. Some rivers have improved to meet Exceptional Warmwater Habitat (EWH) with the Great Miami River in downtown Dayton a recent example. The degree of improvement has been much greater in large rivers compared to small streams with a net gain of more than 70% of river miles meeting standards since 1980 compared to a net gain of just more than 20% for small streams. The difference is due to the success of reducing pollution via the “NPDES” (National Pollution Discharge Elimination System) permitting program and that many of these sources are located on large rivers. The comparatively lesser proportion of smaller streams meeting standards is due to the greater influence of “nonpoint sources” of pollution consisting of runoff from land surfaces and stream habitat alteration, neither of which is subject to a comparable regulatory program. Instead, nonpoint sources are managed by incentive based or voluntary programs, most of which have shown varying degrees of success in actually improving water quality to meet standards. Nonetheless, we are now seeing an unprecedented biological recovery in the tributaries to many of the large, mainstem rivers as an indirect result of the aforementioned success in controlling pollution and the improved access to tributaries via mainstem rivers. All of this happened despite initial doubts about the treatability of sewage and the attainability of the then poorly understood biological goals of the CWA when they were first introduced in the 1970s. From the first reported evidence of serious water pollution in the Scioto River in the 1880s to the installation and operation of advanced wastewater treatment after 1988, it took more than a century before sufficient actions to reduce pollution took place and another 30+ years to document full recovery. This and the many other remarkable stories of success are the result of dedicated efforts by numerous individuals at the federal, state, local, and private levels who labored through the challenges of setting WQS, water quality based permitting, and implementing advanced wastewater treatment in an economically sustainable manner. Perhaps most will never realize the important role they played in this success story, but hopefully this account will help fill that void.



*Muskellunge in the Scioto River.*

All of this provides a good demonstration about how the benefits of CWA mandated pollution controls have had a lasting impact beyond the immediate receiving river or stream and reductions of pollutants in the late 1980s. It is therefore critical to document this continuing recovery so as to better inform policy and legislation in today’s very challenging deregulatory climate. Unfortunately, Ohio EPA chose to reduce this type of river and stream monitoring by 80% beginning in 2018 which will seriously handicap our understanding about how long this recovery will persist and at a time when new water quality threats are emerging, the population is growing, and the benefits of the CWA are being called into question (Keiser and Shapiro 2018). Perhaps even more important is the waning of institutional memory making knowledge of and communicating the history of CWA successes even more important.

## References

- The biological criteria and aquatic life use designations are codified in the Ohio Water Quality Standards (Ohio Administrative Code 3745-1-07).
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## Dennis Clement receives (SECO) Friend of Science Award



Dennis Clement's dedication and passion to bringing environmental science education and resources to communities knows no bounds. Since becoming the Ohio Coordinator for Water Education for Teachers (Project WET) and Healthy Water, Healthy People, Dennis (OEE) has truly enhanced the presence of these programs across the state.



His commitment and enthusiasm to science education is why the Science Education Council of Ohio (SECO) selected him for this year's Friend of Science Award winner.

The Friend of Science Award is given each year to a science educator or non-educator who has positively influenced science education in the State of Ohio and/or nation through a specific project or sustained activities. Clement was honored at this year's SECO Symposium on January 28th at the Nationwide Conference Center in Lewis Center.

Dennis said, "it was great to be recognized and have the office recognized." He mentioned that his recognition was really a "team effort and that everyone in his office contributes to the team."

His Chief, Carolyn Watkins (OEE) said "he deserves this award because of what happens next. Dennis has come up with innovative ways to leverage the substantive and financial resources science teachers need." Even with this recognition it has not slowed down his dedication. Dennis is currently working on getting more resources for the educators trained at OEE's facilitator workshops and he is working with the Ohio Department of Education on the early childhood curriculum for Project WET. Dennis' hard work has made him more than deserving of this award. **Congratulations, Dennis!**

### Save the Date!

WMAO 48th Annual Meeting and Symposium

**November 13 & 14, 2019**

Crown Plaza - Columbus North / Worthington,  
6500 Doubletree Ave, Columbus OH 43229

# ODA Announces new Western Lake Erie Basin Assistance Programs

[ODA News Release](#), February 2019

Ohio Department of Agriculture (ODA) Director Dorothy Pelanda announced new assistance programs for producers in the Western Lake Erie Basin funded by the passage of Ohio Senate Bill 299.

Signed in 2018, Ohio Senate Bill 299 provided \$23.5 million for soil and water conservation districts (SWCD) located in the Western Lake Erie Basin (WLEB) for nutrient management programs. ODA has already distributed \$3.5 million to 24 SWCDs in Northwest Ohio.

"Water quality is a top priority of our administration," said Governor Mike DeWine. "Roughly three million Ohioans rely on Lake Erie for their drinking water. These programs are a good step toward promoting better water quality, and more will come."

At the 2019 Ohio Federation of Soil and Water Conservation Districts Annual Meeting this morning, Director Pelanda announced plans for the remaining \$20 million, to be spread across three new assistance programs:

The Ohio Working Lands Program will encourage producers to establish year-round vegetative cover on eligible crop land. The program will promote the conversion, establishment and maintenance of forage/hay land on certain cropland acres. Also, there will be a new incentive payment to encourage producers to re-enroll acreage through the Lake Erie Conservation Reserve Enhancement Program. This will help reach the 67,000 acre goal and increase conservation efforts.

- The Voluntary Nutrient Management Plan Development Program will be a partnership with the Ohio Agribusiness Association, in which producers are reimbursed for soil testing and nutrient management plans. This would help to ensure the 4R principles are put into place.
- The Cost Share and Equipment Buy Down Program will provide producers with funds to purchase technological improvements to agricultural land, equipment and structures to reduce nutrient loss.

"This \$20 million suite of practices will go a long way toward our clean water initiatives and helping us set the tone for water quality efforts statewide," said Director Pelanda. "Our agency looks forward to working with producers to implement meaningful programs that make progress toward our common goals of soil and water conservation."

"Ohio's farmers are committed to doing their part to keep nutrients on our fields and out of our water and these programs will help us do that," said Kris Swartz, Past President of the Ohio Federation of Soil and Water Conservation Districts and Northwest Ohio farmer. "I'm confident interest for these programs will be strong and I know our soil and water districts are ready to put them into practice."

"Our members understand how important our role is helping farmers practice proper nutrient stewardship and the 4R's," said Chris Henney, President and CEO of the Ohio Agribusiness Association. "We're excited to be part of these programs and stand ready to help Northwest Ohio farmers."

Producers located in the Western Lake Erie Basin are encouraged to contact their local soil and water conservation district office to learn more and sign up for these new programs.



# Cuyahoga River Water Quality Continues to Improve; U.S. EPA Agrees to Remove “Restrictions on Fish Consumption” Impairment Designation

Ohio EPA News Release

Confirming research showing continued improvements to local water quality, U.S. EPA has agreed with Ohio EPA's recommendation that restrictions on fish consumption in the Cuyahoga River (from Gorge Dam to Lake Erie) can be eased. Any remaining advisories for that segment of stream are now consistent with the [state's general recommendations](#) (updated yearly).

In 2018, Ohio EPA asked U.S. EPA to remove what's known as a Beneficial Use Impairment (BUI), in this case, a restriction on fish consumption from this stream segment identified as an Area of Concern (AOC). The state made this request based on data from fish tissue sampling which shows significant improvements in the health of fish in the stream. Federal officials agreed. Removing this impairment takes Ohio one step closer to the goal of delisting the Cuyahoga River as an Area of Concern.

"This is an example of the progress that can be achieved when you collaborate and dedicate resources to improving the quality of water in our state," Ohio Governor Mike DeWine said. "We need to continue to invest in our water resources so that we can see additional improvements."

BUIs identify specific problems that can prevent a waterbody from meeting its full water quality potential. In 1992, the AOC advisory committee identified 10 BUIs, degrading the Cuyahoga River and needing to be addressed. The seven impairments which remain are detailed on the [Cuyahoga River AOC webpage](#).

"If you safely can eat the fish, we know that's a great indication that water quality is improving," Ohio EPA Director Laurie A. Stevenson said. "The Ohio Areas of Concern are a priority and we look forward to working with our many partners in continuing progress in the Cuyahoga River, to advance Governor DeWine's major priority of restoring our state's crown jewel, Lake Erie."

"The removal of this BUI is a huge step for the Cuyahoga River Area of Concern," EPA Region 5 Administrator Cathy Stepp said. "Many years of collaborative effort at the federal, state and community levels are paying off and we're making great progress in improving the health of the river."

"As we approach the 50th anniversary of the most infamous Cuyahoga River fire, we reflect on the progress that has been made," Kyle Dreyfuss-Wells, CEO, Northeast Ohio Regional Sewer District said. "We appreciate our advisory and technical support role on the Cuyahoga AOC and know that the data provided by our Water Quality and Industrial Surveillance team has been integral in approving this BUI removal."

This significant milestone was achieved through the collaborative efforts of dedicated local, state and federal partners. In September, Ohio EPA held a public meeting in Parma to accept comments as part of the removal recommendation process. Members of the public were invited to attend to learn about the BUI change proposals and provide comments. Ohio EPA and the Ohio Lake Erie Commission continue to advance towards the removal of the remaining BUIs with the AOC local partners. As each BUI removal goal is met, Ohio EPA will notify the community, seek public input and submit additional BUI removal recommendations to U.S. EPA.



## 2019 MS4 Training - Managing an Effective Stormwater Program: Overcoming issues in your MS4 program!

*(Hosted by The WAVE Foundation at the Newport Aquarium)*

Whether you have been recently designated an MS4 community or you have been working with the MS4 program for years, come learn about the “nuts and bolts” of a good program and how to resolve programmatic issues. Join us for a half-day workshop to better understand permit requirements and compliance issues while networking with other MS4 communities and Ohio EPA stormwater staff.

This training will provide all the information and tools your Community needs to manage a successful MS4 program compliant with the latest Ohio stormwater general permit. Ohio EPA will provide insight on recent NPDES program audits and existing successful MS4 communities will share their perspectives on the “must know” and “what’s new” program elements. The session will culminate with a panel question and answer session, where you may ask all your program questions and receive program-experienced answers.

After the workshop, all attendees will receive a pass into the Aquarium to enjoy their remaining afternoon.

**Date: May 8, 2019, Time: 10:00 a.m. – 2:00 p.m.**

**Cost: \$50.00** *(Cost includes parking, refreshments, lunch, useful handouts, great contacts and Aquarium admission!)*

<https://ohioswa.com/event/2019-ms4-boot-camp-training/>

## Modified Sand Treats Stormwater, Protects Groundwater

A research team from the University of California–Berkeley (UCB) is exploring how alternative water sources, such as stormwater, could be repurposed to help keep aquifers brimming.

Joseph Charbonnet, a UCB graduate student and the lead author of a study that recently appeared in the journal *Environmental Science & Technology*, claims that a new treatment medium made from chemically modified sand can help change the way California approaches both groundwater recharge and stormwater management.

[Charbonnet describes this passive, low-cost, non-invasive natural method of cleaning stormwater.](#)





# 2019 Ohio Stormwater Conference

Stormwater and  
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One of the Largest Regional  
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May 8-10, 2019

Sharonville Convention Center  
Sharonville, Ohio  
[www.ohstormwaterconference.com](http://www.ohstormwaterconference.com)



<https://ohstormwaterconference.com/>

## Rain Barrel Art Project 2019

If you visit the Cincinnati Zoo and Botanical Garden during the month of April, you will be greeted by a large number of beautifully rain barrels; 40 of them to be precise. These barrels were painted by local artists and will be on display at the Zoo till April 25. One of these wonderful barrels could indeed adorn your garden or front lawn.

The purpose of the project is to bring attention to storm water and how individual behavior can help solve some of the problems. This event coincides with the Zoo's Party for the Planet on April 25, 2019. Over 50 organizations will be in attendance with exhibits on environmental issues. Entry to the Zoo is free after 5:00pm.

An online auction of the 40 barrels will begin on April 15 and will end on April 25 during the Zoo's Party for the Planet. To learn more about the **Rain Barrel Art Project** follow this [link](#). To learn about the **Cincinnati Zoo's Party for the Planet** follow this [link](#).





<http://www.ofma.org/training-education/2019-asfpm-national-conference>

## Pilot Project at Corning Complete

Reprint from Rural Action, **Michelle Shively**, Sunday Creek Watershed Coordinator

Construction of the Corning Paint Pigment Pilot Project is complete! The project seeks to turn iron-laden acid mine drainage into a marketable product while simultaneously improving water quality. Installation of the Corning plant was completed in mid-October. During operation, the plant treats approximately 1.5 gallons per minute. This research-sized facility is ideal for modifying and fine-tuning this unique process. The Corning water treatment plant was drained and winterized for the cold winter months, but will resume operations once warmer temperatures return.



First, mine water is pumped through three tanks where the iron precipitates and settles to the bottom of the third tank for collection. Once the water is iron free, the pH is raised and it is released back into the stream. Meanwhile the iron left behind in the tanks is collected. Once the iron is dry, it is processed into paint pigment and can be turned into artwork.

Rural Action is currently seeking funding to construct a full-scale plant at the Truetown Discharge, another large mine discharge in the Sunday Creek watershed. The full-scale plant will function similarly to the Corning Paint Pigment Pilot Project. The full-scale operation hopes to treat 100% of the water discharging from the mine, resulting in the recovery of 7 miles of Sunday Creek.



## Who Will You Educate About Water?

[www.projectwet.org](http://www.projectwet.org)



For more than 30 years, educators have been using our materials to teach about water. From pre-school through pre-service, educators of all kinds rely on Project WET activities and other resources to teach about water conservation, water quality, watersheds, water and health, water careers and more. Our teaching methods excite students, teach valuable skills and instill a lifelong commitment to responsible environmental stewardship.

With roots in a North Dakota state agency, Project WET has relied on support from federal, state and local governments, international organizations, family foundations and some of the world's largest companies. The thousands of individuals and organizations who purchase our materials each year have also allowed us to weather difficult funding environments. We are grateful for the amazing diversity of support for water education since 1984.



In 2019, however, we are facing unprecedented challenges. Across the country, environmental education programs are facing cutbacks, even though water education is more important than ever. A changing climate and growing population are putting even more strain on the fresh, clean, available water we all share. These challenges can only be addressed when people have a basic understanding of water.

We need your support to [#teachwater](#). Can you help us by [donating](#) to the campaign and sharing our work with your friends and colleagues?

## Janelle Mead as New CEO of OFSWCD

By **Bob Short**, OFSWCD President

I am happy to announce Janelle Mead started service as the Ohio Federation of Soil and Water Conservation District (OFSWCD) new CEO on March 18, 2019, filling a vacancy left by Mindy Bankey who is now serving as Assistant Director of the Ohio Department of Natural Resources. Janelle has a wealth of experience, which will help lead our organization in this next chapter. Growing up on her family's row-crop farm in Fayette County, Mead has always been interested in agriculture. Most recently, Mead served as the deputy director of the Ohio Department of Agriculture. Her responsibilities included overseeing the department's animal health, communications, legislative, and marketing efforts, and shaping department policy. Mead has also worked for the Ohio Farm Bureau Federation, The Ohio State Alumni Association and Mycogen Seeds. She is a graduate of The Ohio State University where she earned a degree in agricultural communications. She and her family live in Fayette County.



Please join me in welcoming Janelle!

## WATER MANAGEMENT ASSOCIATION OF OHIO

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*Dana Oleskiewicz, Administrative Director*

[www.wmao.org](http://www.wmao.org)

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

**VISION:** To be recognized statewide as the go-to community for people who manage and safeguard Ohio's water resources.

**MISSION:** To support Ohio's water resource professionals with essential information, education, and networking opportunities

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