Volume 08 | August 2019

Ohio Water Resources Center Newsletter

From Our Directors

The recent introduction by the Senate of their version of the Water Resources Research Amendments Act of 2019, compliments the prior House release of the same legislation and signifies important progress is being made toward reauthorizing the Water Resources Research Act. Should this Act be passed, it will provide for some important changes to the program. Foremost are an increase in budget for the program to $10,000,000 from $6,500,000 and a reduction in the required cost share to 1:1. Additional changes will also streamline the reporting process. What doesn't change is the emphasis on the program to provide a vital link between federal water interests and needs and the expertise located within each states' research universities. This is what makes the program unique and provides an impact across the entire United States while addressing local water resource issues.

Spotlight

USGS - 104(b) Annual Base Grant

The Ohio Water Resources Center (WRC) is seeking research pre-proposals to address current water resources issues in the State of Ohio. This annual competition for in-state researchers is made possible through the Water Resources Research Institute 104(b) Program. The aim of these grants is to stimulate water-related research relevant to Ohio to the point where a highly competitive external proposal can be developed.

The Ohio WRC will accept any pre-proposal related to Ohio water resources issues, but expects to give priority to proposals that address algal blooms & nutrients, water & energy nexus issues, and water technology & emerging issues.

The application deadline for pre-proposals is **4:00 PM, Monday, August 12th, 2019**. Pre-proposal decisions and an invitation to submit a full proposal will be announced the week of September 9th, 2019. Full proposals will be due October 24th, 2019 by 4:00 PM and funding decisions will be made by January 15th, 2020. Funding is anticipated to begin on March 1st, 2020. Typically, the Ohio WRC will award $25,000-$35,000 to grant recipients (past recipients).

Find more details about how to submit a pre-proposal on our our website. If you have any questions, feel free to email OhioWRC@osu.edu.

News Updates

Underwater glacial melting is occurring at higher rates than modeling predicts
Via Phys.org, July 25th, 2019

EPA announces new program designed to clean up Great Lakes
Via Cleveland.com, July 22nd, 2019

Americans are drilling deeper than ever for fresh water
Via ScienceDaily, July 22nd, 2019

Lots of lead in the water? Maybe manganese is to blame
Via EurekaAlert!, July 22nd, 2019

Lake County mayors seeking Special Improvement District to combat Lake Erie erosion
Via The News-Herald, July 21st, 2019

Lawmakers pass new budget with clean water money for Lake Erie
Via Sandusky Register, July 18th, 2019

Minuscule microbes wield enormous power over the Great Lakes, but many species remain a mystery
Via Phys.org, July 12th, 2019

Large algae bloom in Lake Erie predicted for 2019
Via Ohio's Country Journal, July 12th, 2019

Watershed Moment: "Ephemeral" Streams Debate Could Reshape Ohio Valley Waterways
Via WOUB Public Media, July 5th, 2019

Researchers thirst for information on water in Ohio counties
Via The Parkersburg News and Sentinel, July 1st, 2019

Have a news article you'd like us to feature in our Newsletter? Email us at OhioWRC@osu.edu!

Ohio WRC Research Highlight

Separation of Phosphorous- and Nitrogen Nutrients from Agriculturally Degraded Waters Using Previous Filter Material Developed from Industrial By-products

Dr. Chin-Min Cheng, a Senior Research Engineer in the Department of Civil, Environmental, and Geodetic Engineering at Ohio State University, and collaborator **Dr. Linda Weavers** completed an Ohio WRC funded project titled "Separation of Phosphorous- and Nitrogen Nutrients from Agriculturally Degraded Waters Using Previous Filter Material Developed from Industrial By-products". The goal of the project was to demonstrate the feasibility of applying a low-cost and environmentally-sustainable approach to agriculture drainage water (ADW) handling and treatment. Excessive releases of phosphorous (P) and nitrogen (N) from soil to drainages is a leading cause of harmful algal blooms and eutrophication in water bodies. While many best management practices focus on source reduction and minimizing transport, these methods have not proven to prevent dissolved phosphorous loss, which is the form most readily available to aquatic organisms.

Instead, drain-end filtration has been suggested as a better approach, although ideal filter materials have yet to be identified.

In this project, two specific pervious materials were tested: P-type (composed of fly ash, stabilized flue gas desulfurization (FGD), and quick lime) and N-type (composed of fly ash, FGD, and red mud). One column test was a closed-loop test to simulate the removal of phosphate and nitrates when passing ADW through an unlimited length of pervious sorbent column. It was found that the concentration of nitrate in the in the first series decreased over 68.5% after 30 hours of circulation (Figure 1). In the second series, a removal efficiency of 60.1% was observed during the first 26 hours when only N-type column was used. For phosphate, over 95% of the phosphate in the solution was removed within 30 hours of circulation (Figure 2). These results indicate that the pervious materials used in this study can effectively decrease the concentration of nitrate and phosphate.

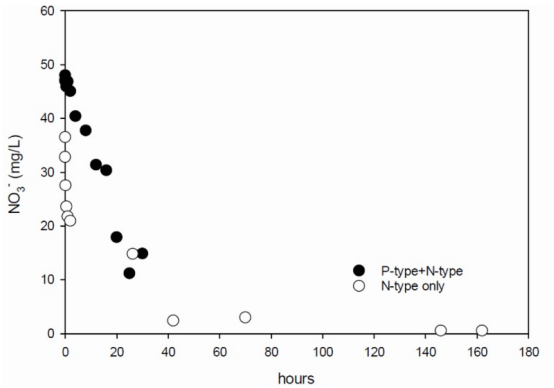

Figure 1. Temporal trend of nitrate in the closed-loop column system

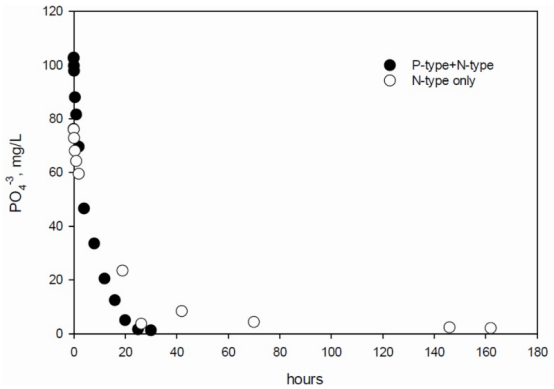

Figure 2. Temporal Trend of phosphate in the closed-loop column system

Additionally, a flow-through column test was setup to further assess the removal of nitrate and phosphate. The results showed over 77% of nitrate removal was achieved after one pore volume passing through the column, and increased to 98% after 168 hours (Figure 3). For phosphate, over 99% of removal was achieved after 28 pore volumes, an increase from the 82.5% observed after one pore volume (Figure 4). Results obtained from the flow through column test confirmed the potential of using pervious material derived from stabilized FGD material (P-type) to remove both nitrate and phosphate from agricultural drains.

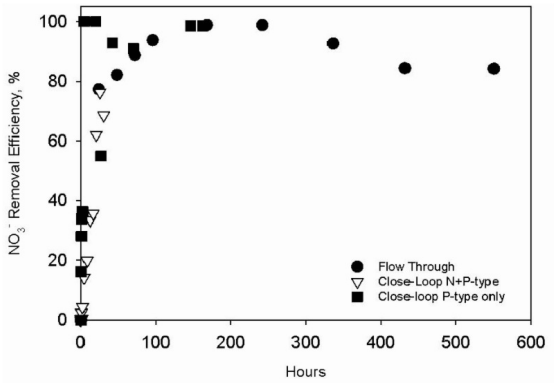

Figure 3. Removal efficiency of nitrate using the P-type pervious material with a flow through column

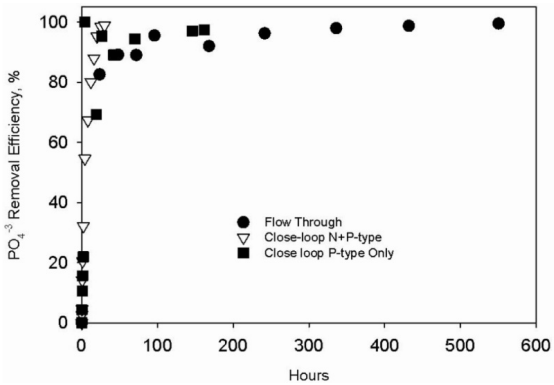

Figure 4. Removal efficiency of phosphate using the P-type pervious material with a flow through column

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If you'd like to find out more about Dr. Cheng's research, visit his website. If you'd like to see some other Ohio WRC research projects, visit: https://wrc.osu.edu/past.

Opportunities

WMAO 48th Annual Meeting and Symposium Call for Abstracts

The theme of this year's meeting and symposium is *Weather Weirding.* Weather today is weird with extreme events happening more frequently. This affects water systems and how

we must manage our precious natural resources. Global climate weirding is a descriptive way to refer to this phenomenon. Water management in Ohio is equally influenced by this worldwide weirding causing hotter, drier, wetter, and windier condition. The Keynote Speaker will be Aaron Wilson, OSU Byrd Polar and Climate Research Center.

For full abstract submittal information, click here. To directly access the online submittal form, click here. Abstracts will be accepted for oral presentation up **until August 21st.** Poster abstract submittal **deadline is October 15th.** The meeting and symposium will take place November 13th and 14th at Crowne Plaza Columbus North, 6500 Doubletree Avenue, Columbus.

U.S. EPA - Postgraduate Research Opportunity with the Hypoxia Task Force

A postgraduate research opportunity is currently available at the U.S. Environmental Protection Agency's (EPA) Office of Water (OW) located in Washington, DC. The selected participant will have the opportunity to gain hands-on experience through analysis and research with the Hypoxia Team, the Hypoxia Task Force and SERA-46 (a committee of research and extension specialists at land grant universities) in the Watershed Restoration, Assessment and Protection Division, within the Office of Wetlands, Oceans, and Watersheds. The participant will be trained in opportunities for evaluating, improving and communicating results that track the progress of nutrient reduction efforts through varied metrics. The qualified candidate should have received a bachelor's or master's degree in a relevant field or be currently pursuing the degree and will reach completion by the appointment start date. Degree must have been received within five years of the appointment start date. Applications will be reviewed on a rolling-basis. More information.

WRF - Assessing the Microbial Risks and Potential Impacts from Stormwater Collection and Uses to Establish Appropriate Best Management Practices (RFP 5034)

Project Objectives:

- To assess the microbial risks and potential impacts from stormwater collection and onsite reuse to help establish appropriate best management practices for stormwater harvesting/reuse and other stormwater control measures.
- To better understand the severity of stormwater microbial contamination from fecal indicator bacteria and other pathogens, types and concentration of microbes, as well as growth over time in a variety of common stormwater scenarios.
- To use the Risk-Based Framework for the Development of Public Health Guidance for Decentralized Non-potable Water Systems (SIWM10C15) to develop a "Roadmap" that can guide utilities/stormwater managers in assessing site-specific microbial risks associated with stormwater collected for intended uses.
- To synthesize key methods and strategies in assessing baseflow and rain/snowmelt event microbial indicators to aid risk management based on evolving log-reduction pathogen targets.

Applicants may request up to $75,000 in WRF funds for this project. WRF funds requested and total project value are evaluation criteria considered in the proposal selection process. Proposals must be received by 2:00 pm Mountain Time on **Tuesday, September 24th, 2019**. More information.

WRF - Demonstrating the Effectiveness of Flushing for Reducing the Levels of Legionella in Service Lines and Premise Plumbing (RFP 5033)

Project Objectives:

- To assess the effectiveness of flushing to reduce the levels of Legionella in service lines and premise plumbing pipes, either as a corrective response or for ongoing

maintenance.
- To evaluate the use of water quality parameters as an indicator for effectiveness of flushing.
- To develop data-driven guidance on applicability and effectiveness of flushing as a method for Legionella control.

Applicants may request up to $200,000 in WRF funds for this project. WRF funds requested and total project value are evaluation criteria considered in the proposal selection process. Proposals must be received by 2:00 pm Mountain Time on **Tuesday, September 24th, 2019**. More information.

WRF - Occurrence of PFAS Compounds in U.S. Wastewater Treatment Plants (RFP 5031)

The objective of this study is to evaluate PFAS occurrence in U.S. wastewater treatment plants and determine the fate of PFAS compounds during wastewater treatment. Applicants may request up to $250,000 in WRF funds for this project. WRF funds requested and total project value are evaluation criteria considered in the proposal selection process. Proposals must be received by 2:00 pm Mountain Time on **Thursday, September 12th, 2019**. More information.

To find more resources offered by Ohio WRC, please visit: https://wrc.osu.edu/resources

Policy Update

Notice of Intent To Develop a Policy for Determining Harmful Algal Bloom (HAB) and Hypoxia Events of National Significance in Marine or Coastal Waters

The Harmful Algal Bloom and Hypoxia Research and Control Amendments Act of 2017 (HABHRCA) provides NOAA with authority to determine that a harmful algal bloom (HAB) or hypoxia event in marine or coastal waters is an event of national significance. NOAA may make this determination on its own initiative or upon the request of the Governor of an affected state. Following an event of national significance determination, NOAA is further authorized to make sums available to the affected state or local government for the purposes of assessing and mitigating the detrimental environmental, economic, subsistence use, and public health effects of the event of national significance. Funds would be subject to the availability of appropriations. The Federal share of the cost of any activity carried out for the purposes described above may not exceed 50 percent of the cost of that activity.

NOAA is soliciting comments to inform the development of agency policy for determining HAB and hypoxia events of national significance in marine and coastal waters. NOAA will subsequently issue, in the Federal Register, notice of availability of the draft policy and provide an opportunity for formal public comment on the draft policy after it is prepared. Note that HABHRCA provides the United States Environmental Protection Agency (EPA) with comparable authority for determining freshwater hypoxia or HAB events of national significance. The EPA will issue a separate notice to solicit comments on freshwater hypoxia or HAB events. More information.

Proposed Two-Pronged Approach to Surveying and Monitoring Aquatic Life in Ohio's Streams and Rivers

Each year, Ohio EPA collects data from streams and rivers in five to seven areas of the state. A total of 400 to 450 sampling sites are examined, and each site is visited more than once. During these studies, Ohio EPA scientists collect chemical samples, examine and count fish and aquatic insects, and take measurements of the stream. There are three major objectives for the studies:

- To determine how the stream is doing compared to goals assigned in the Ohio Water

Quality Standards (WQS);
- To determine if the goals assigned to the river or stream are appropriate and attainable; and
- To determine if the stream's condition has changed since the last time the stream was studied.

Ohio EPA is currently accepting comments on the Proposed Two-Pronged Approach to Surveying and Monitoring Aquatic Life in Ohio's Streams and Rivers. Information regarding the monitoring strategy can be found in the Webinar, PowerPoint and Fact Sheet below. **The comment deadline is August 12, 2019.**

Webinar PowerPoint Fact Sheet

Upcoming Events

Tinker's Creek Watershed Partners Ethics & Engineering Professional Development - September 17th

Tinker's Creek Watershed Partners is hosting their third Ethics & Engineering Professional Development workshop to offer Engineers 2.5 ethics CEUs on September 17, 2019 at the Watershed Stewardship Center in Parma, Ohio. This day will include presentations from The Ohio Board of Registration for Professional Engineers and Surveyors. Speakers include: *Jason McLean*, Enforcement Supervisor, and *John Greenhalge*, Executive Director.

This day will consist of your choice between two sessions, one morning and one afternoon, so choose which time frame works best. Morning Session is 8:30-11:30 am and Afternoon Session is 12:30-3:30 pm. Cost is $50, and snacks and refreshments will be provided. More information.

Understanding Algal Blooms: State of the Science Conference - September 12th

The 4th annual Understanding Algal Blooms: State of the Science conference in Toledo, Ohio will highlight current scientific knowledge related to algal blooms. Research and outreach leaders will present findings from recent studies and identify important areas of uncertainty.

Expected audience includes academic researchers, state and federal agencies and the agricultural community interested in the latest algal bloom science and technology, with an expected audience largely from Indiana, Michigan and Ohio. Members of the academic research community, state and federal agencies and the agricultural community are especially encouraged to attend.

The conference has been approved as professional development for 5.25 contact hours by the Ohio EPA.

Register

Water Environment Federation's Technical Exhibition and Conference - September 21st to September 25th

WEFTEC is the largest conference of its kind in North America and offers water quality professionals from around the world with the best water quality education and training available today.

Also recognized as the largest annual water quality exhibition in the world, the expansive show floor provides unparalleled access to the most cutting-edge technologies in the field; serves as a forum for domestic and international business opportunities; and promotes

invaluable peer-to-peer networking among registrants.A wide range of topics and focus areas allow registrants to design their own, unique learning experience while earning up to 16.5 Professional Development Hours (PDHs) for continuing education units and eight general Contacts Hours per day visiting the Exhibition. More information.

ORBCRE - ORBA Symposium at Ohio University - October 2nd to October 4th

Ohio University invites you to the 2019 Ohio River Basin Consortium for Research and Education (ORBCRE) Symposium in Athens, Ohio. This year's theme, "Managing our Water in a Changing World: from Social, Environmental, and Policy Perspectives," promotes research, education, and discussion related to environmental concerns in the Ohio River Basin. Since 1985, ORBCRE has brought universities, colleges, government agencies, businesses, and individuals together along the Ohio River to address regional water-related issues and stimulate solutions.

The symposium will be seeking input from stakeholders and presenters toward the completion of a strategic plan for the Ohio River Basin in order to maximize value across eight goal areas: (1) Support and Enhance Healthy and Productive Ecosystems (2) Provide Reliable Flood Control and Risk Reduction (3) Serve as the Nation's Most Valuable River Transportation Corridor (4) Maintain a Supply of Abundant, Clean Water (5) Support Local, State, and National Economies (6) Provide World-Class Recreation Opportunities (7) Adapt Effectively to Changing Conditions in the Basin (8) Make Data-Driven Decisions based on Current Information and Research. More information.

Have an event you'd like us to feature in our Newsletter? Email us at OhioWRC@osu.edu!

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