

Ohio Water Resources Center Newsletter

From Our Directors

The Ohio Water Resources Center (WRC) is the federally-authorized and state-designated Water Resources Research Institute (WRRI) for the State of Ohio. Over the past decade, we have provided research funding for over 50 water related projects. The impact of the Ohio WRC spans the entire State, funding and managing research projects at many Ohio universities. With the assistance of the United State Geological Survey (USGS) and the Ohio Water Development Authority (OWDA), we are happy to announce the funding of four new projects starting June 2019!



Dr. Refsnider's student, Jessica Garcia, studying the effects of HABs on immune functioning of aquatic turtles.

- **Dr. Andy May**, Assistant Professor, The Ohio State University (*Investigating the extent of drinking water source contamination in southeastern Ohio by air emissions of HFPO-DA from the Chemours Washington Works facility*)
- **Dr. Patrick Ray**, Assistant Professor, University of Cincinnati (*Multidimensional Risk Assessment on Riverine Contamination: Case Study of Cincinnati, OH*)
- **Dr. Lei Wu**, Assistant Professor, Ohio University (*Capillary trapping of buoyant particles by cylindrical collectors and its application in transport of floating fertilizers in overland flow*)
- **Dr. Jorge Villa**, Visiting Assistant Research Professor, The Ohio State University (*Linking wetland ecological functions: towards a combined-ecosystem service quantification to promote ecosystem health in Lake Erie*)

Congratulations again to this year's recipients! We will be releasing a call for next year's pre-proposals on July 8th, 2019 with a pre-proposal application deadline on August 2nd, 2019. Pre-proposals will be accepted via Ohio WRC email (OhioWRC@osu.edu) and detailed instructions will be provided.

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Spotlight

Ohio WRC Outreach

While the Ohio WRC may be primarily known as a research institute, we also collaborate with partners to reach the youth and general public on water resources issues. On Wednesday, May 15th, fifth-grade students from schools across Franklin County attended the 12th annual **Central Ohio Children's Water Festival** at Franklin Park in Columbus, Ohio. The Festival promotes awareness of our valuable water resources through interactive displays, hands-on workshops, and fun presentations about drinking water, storm water and wastewater. The Ohio WRC led a



hands-on activity about buoyancy, during which students explored the density of objects and liquids, and built paper boats they attempted to sink with metal washers.



A few days later on Saturday, May 18th, the Ohio WRC took part in **WestFest: West Campus Science & Sustainability Festival**. The event featured hands-on activities, tours of west campus research facilities, and lots of fun! The Ohio WRC hosted a Project WET activity called *The Incredible Journey*, which shows how dynamic the movement of water is. By role-playing a water molecule, participants learn to conceptualize the water cycle in a way that more closely approximates how water actually travels. In a game of chance and probability,

participants collected beads as they traveled between lakes, clouds, soil, rivers, glaciers, plants, animals, and oceans!



Water Education for Teachers

Together with the Ohio EPA, ODNR, and WMAO, we support and assist in administering **Project WET (Water Education for Teachers)**. Project WET's mission is to reach children, parents, teachers and community members of the world with water education that promotes awareness of water and empowers community action to solve complex water issues.



In partnership with the Friends of the Lower Olentangy Watershed (FLOW) and the Ohio Sierra Club Water Sentinel Program, the Ohio WRC facilitates **Citizen Science and Monitoring** by training and coordinating citizens to monitor streams and ravines in the central Ohio area.



The Citizen Lake Awareness and Monitoring (CLAM) program, sponsored by the Ohio Lake Management Society (OLMS), provides an opportunity for Ohio citizens to take an active role in learning about aquatic ecology, lake and stream water quality, and watershed management.

Find more information by visiting [our website](#).

News Updates

[Are coal-fired power plants affecting your drinking water?](#)

Via Phys.org, May 27th, 2019

[Student scientists vie for 2019 U.S. Stockholm Junior Water Prize](#)

Via WaterWorld, May 21st, 2019

[Algal blooms in Lake Erie's central basin could produce neurotoxins](#)

Via Ohio State News, May 16th, 2019

[Drones help farmers detect disease, manage water](#)

Via The Journal, May 13th, 2019

[Arsenic-breathing life discovered in Pacific](#)

Via EarthSky, May 12th, 2019

[Huizenga, others call for Great Lakes mapping update](#)

Via Holland Sentinel, May 11th, 2019

[Using Heat Exchangers for Energy Recovery and Water Reuse](#)

Via Water Technology, May 6th, 2019

[The State Of The World's Water — 7 Graphics](#)

Via Clean Technica, May 6th, 2019

[Toledo celebrates 'National Drinking Water Week'](#)

Via WTOL11, May 4th, 2019

['Forever Chemicals' Ruin Dairies](#)

Via Ohio's Country Journal, May 2nd, 2019

[Toxin levels still high at Grand Lake St. Marys](#)

Via ABC22, May 2nd, 2019

[EPA to Fund Study on Whether Treating Drinking Water Limits PFAS Exposure](#)

Via NC State University News, May 2nd, 2019

[Reducing Harmful Lake Erie Algal Blooms: What Will It Take?](#)

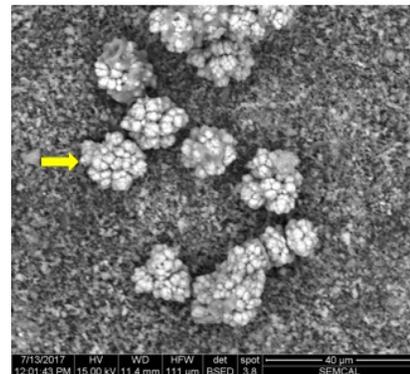
Via Public News Service, May 2nd, 2019

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

Ohio WRC Research Highlight

Remediation of Hydraulic Fracturing Flowback Fluids by Trace Element Extraction

Dr. Susan Welch, a Research Associate in the School of Earth Sciences at The Ohio State University, along with **Drs. David Cole and Julie Sheets**, completed an Ohio WRC funded project titled "*Remediation of Hydraulic Fracturing Flowback Fluids by Trace Element Extraction*". The goal of the project was to conduct laboratory experiments to determine conditions for the formation of secondary precipitates that could sequester and concentrate valuable metals from hypersaline hydraulic fracturing flowback fluids (HFFF). The results of these experiments could eventually be scaled up and applied to HFFF storage facilities and operators could potentially recover economically valuable metals from this waste product.



SEM image of barite-celestite clusters (arrowed), on fine grained akaganeite

The strategies to remove potentially toxic or economically important elements explored by the group included inducing oxidation, addition of chemical amendments to induce mineralization and concentrate metals in the solid phase, or biologically mediated sorption-precipitation reactions. Furthermore, they also determined the feasibility of adding sulfate-rich acid mine drainage to induce precipitation of sulfate minerals (barite, celestite) or jarosite group minerals, thereby removing both major and trace metals from solution.

The geochemical behavior of trace elements in these experiments was complex. The addition of sulfuric acid, or sodium carbonate and subsequent precipitation of barite, celestite, gypsum and calcite had no measurable effect on the concentrations of alkali metals (Li, Rb, or Cs) and surprisingly, had very little effect on most of the transition metals measured (Ni, Cu, and Zn). The group concluded the mineralogical composition of

precipitates varies with the type and concentrations of chemical additions mixed with the flowback fluids. Sulfates precipitate with the introduction of sulfuric acid, and carbonates precipitate with introduction of sodium bicarbonate. In the case of sulfuric acid addition, the concentration of the acid determines the phases that precipitate. Barite precipitates upon addition of lower levels of sulfate, and gypsum and celestite were observed at the highest sulfate treatments.

If you'd like to find out more about other Ohio WRC research projects, visit:
<https://wrc.osu.edu/past>.

Opportunities

Water Management Association of Ohio - 48th Annual Meeting and Symposium Call for Abstracts

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. Tell us your story related to water wierding. Deadline to submit is **Monday, July 1, 2019**. For full abstract submittal information, click [here](#).

P3 Great Lakes - Green Stormwater Infrastructure Challenge

P3GreatLakes has an open Request for Statement of Interest (RSI) for their Green Stormwater Infrastructure Challenge select two municipalities from the Great Lakes basin states (Minnesota, Wisconsin, Illinois, Indiana, Michigan, Ohio, Pennsylvania, and New York) to pilot innovative delivery and financing approaches for green stormwater infrastructure. Responses to the RSI are due **Friday, July 12th, 2019 at 5PM** and can be sent to GreatLakesRSI@ectinc.com. For more information about the project, please visit the [P3GreatLakes website](#).

EPA - Great Lakes Restoration Initiative 2019 RFAs

Under this RFA, EPA expects to award a total of approximately \$14 million for about 30 nonpoint source projects in 5 categories addressing agricultural nutrients and stormwater runoff. Specifically, EPA is requesting grant applications under the following funding opportunities:

- **Riparian Restoration to Reduce Runoff to Maumee River (EPA-R5-GL2019-RRM)**
 - Approximately \$4 million available for 5 to 10 projects
- **Green Infrastructure to Reduce Stormwater Runoff (EPA-R5-GL2019-GIU)**
 - Approximately \$2 million available for 5 to 8 projects
- **Manure Management to Reduce Nutrient Runoff from Farms (EPA-R5-GL2019-MMF)**
 - Approximately \$2,5 million available for 5 to 8 projects
- **Accelerating Adoption of Nutrient Management through Farmer-led Outreach and Education (EPA-R5-GL2019-ANM)**
 - Approximately \$4 million available for 4 projects
- **Water Quality Trading and Other Market-based Approaches for Nutrient Reduction (EPA-R5-GL2019-WQT)**
 - Approximately \$1.5 million available for 4 projects

Applications are requested for projects within the five categories listed above, each of which has a separate Funding Opportunity Number (FON) and is separately posted on www.grants.gov. Applicants must apply for the specific funding opportunity they

are interested in. [More information.](#)

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

Upcoming Events

Stockholm Junior Water Prize National Competition at Ohio State - June 13th to June 16th

The Water Environment Federation, with support from Xylem Inc., is proud to host the 2019 U.S. Stockholm Junior Water Prize at The Ohio State University. The competition brings together state winners and is the most prestigious international youth water prize. The winner of the national competition will be flown to Stockholm to represent the U.S. at the international competition during World Water Week. At the national competition, students will enjoy a taste of college life while they compete, connect, share, enhance their knowledge of water-science, meet other young scientists with like-minded interests, and make life-long friends! [More information.](#)

Riverfest - June 8th

Riverfest has provided thousands of people with the opportunity to kayak and canoe on area rivers over the years. In 2018, more than 1000 people with different backgrounds and experience levels participated in the two-day event. Along with helping people feel more comfortable taking part in water-related activities, Riverfest provides an opportunity to educate local residents on the importance of our region's waterways and how to help protect and conserve these precious resources. [More information.](#)

Northern Olentangy Watershed Festival - June 22nd

The 6th Annual NOW Festival, hosted by the City of Delaware Public Utilities Department, is set for June 22nd at Mingo Park! The festival is designed to engage and educate residents about land and water stewardship, especially within the Northern Olentangy Watershed limits. New this year will be a guided nature walk, an interactive scavenger hunt that can be completed for a prize, and a raffle for a tandem kayak! There will be information booths from several environmental organizations, food trucks, a rain barrel raffle (cash only ticket sales), a duck race, and more! In the event of rain, the festival will be moved into the gymnasium at Mingo. [More information.](#)

Soil and Water Conservation Society 2019 Annual Conference - July 28th to July 31st

The Soil and Water Conservation Society's 74th International Annual Conference will be held July 28-31, 2019 at the Wyndham Grand Pittsburgh Downtown in Pittsburgh, Pennsylvania. The conference includes workshops, breakout sessions, symposia sessions, poster presentations, plenary sessions, and tours designed to raise the awareness of recent developments in the science and art of natural resource conservation and environmental management. [More information.](#)

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

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