EXECUTIVE SUMMARY

As a National Institutes for Water Resources institute, the Ohio Water Resources Center (Ohio WRC) is the federally-authorized and state-designated Water Resources Research Institute for the State of Ohio. We focus on resolving water issues statewide by fostering collaboration among academic researchers and are charged with advancing research applications, and train the next generation of water professionals through participation in research. The emphasis on science allows us to be the objective agent among stakeholders and form links between water researchers and those who manage and use water.

2017-2018 ACTIVITIES

Smart Water Technologies

Our researchers work to solve pressing water issues. By developing technologies and processes to reduce phosphorus and nitrogen from wastewater and agricultural runoff, Ohio WRC researchers are creating solutions to mitigate the detrimental effects of harmful algal blooms. In addition, they are evaluating methods for early HABs detection in Ohio’s lakes. Thus, by designing and using sophisticated tools our researchers are striving to reduce the occurrence and severity of blooms. Key to dealing with this complicated and persistent issue, is the active pursuit of creative and innovative solutions.

Sample Projects

Separation of Phosphorus and Nitrogen Nutrients from Agriculturally Degraded Waters Using Pervious Filter Material Developed from Industrial By-Products
  Chin-Min Cheng, OSU

Effectiveness of Data Buoy as Early Warning Systems for HABs in Lake Erie
  Justin Chaffin, OSU

Design of Self-Cleaning Membrane Assisted Bioreactor for Enhanced Removal of Nutrients from Wastewater
  Soryong Chae, UC

HABs in Recreational Waters

Harmful algal blooms (HABs) continue to be a major issue in Ohio. During blooms, Ohio lakes become virtually unusable resulting in economic impacts to recreational activities. Thus, HABs have great potential to damage tourism to major Ohio water attractions, such as Lake Erie, and determining mechanisms for HABs formation is critical to finding solutions. By breaking down this large problem into discrete research questions, our researchers can better quantify contributing factors and their link to bloom formation, which are necessary steps to create successful long-term solutions.

Sample Projects

Characterizing the Link between Algal Bloom Biomass and Methane Production in Ohio Reservoirs
  Ishi Buffam, UC

Quantifying Direct Groundwater Discharge to Lake Erie and Vulnerability to Hidden Nutrient Loads
  Audrey Sawyer, OSU

Bog History, Ecosystem Status and Land-use for Peatland Restoration in Ohio
  Matt Davies, OSU

On the cover— Macroinvertebrate sampling, Ohio WRC researchers and Sustainable HABs management in Medina Lakes

Sustainable Future Energy

Water is needed for energy production. Correspondingly, energy is crucial for the provision and supply of water. Our researchers are exploring this interrelationship with an aim toward sustainable development of current and new energy sources as well as strategies for more efficient water use.

Sample Projects

Addressing the Water-Energy Nexus of Fossil Fuel Power Generation by Considering Technological, Agro-Ecological, and Economic Options in the Muskingum Watershed
  Bhavik Bakshi, OSU

Improved Estimates of Building Peak Water Demand – Implications for Water-Energy Savings
  Steve Buchburger, UC

Remediation of Hydraulic Fracturing Fluid by Trace Element Extraction
  Sue Welch, OSU

Concentration-Discharge Behavior of Dissolved and Particulate Metals in a Mining Impacted Stream
  Elizabeth Herndon, KSU

Ohio WRC researchers measuring groundwater.

Ohio WRC researchers using data buoys.
EDUCATION & OUTREACH

We strive to share relevant water information with the community in easily accessible formats. We foster relationships between science professionals and the public with our involvement in local activities. Community water education is vital and allows citizens to make informed decisions about very important issues, such as water infrastructure development. By supporting projects that involve community members, we facilitate participation of the public in water quality projects. This helps communities connect directly with water resources we all share and sparks the development of the next generation of water professionals.

Sample Projects and Activities
- Stream Monitoring and Protection in Central Ohio
- Sustainable Algal Bloom Management in Lakes of Medina County
- Children’s and Young Adult’s Festivals, Competitions and Camps
- Seminars, Workshops and Conferences for Water Professionals

From l-r: Children’s water festival, David Costello presenting at Ohio WRC/WMAO Luncheon, Sustainable HABs management in Medina Lakes
COLLABORATION
Sustainable water management strategies demand collaboration between various researchers, stakeholders and governing bodies. We connect researchers from multiple Ohio Universities with federal and state agency representatives and researchers, water management professionals, non-governmental organizations and the public.

2017-2018 BY THE NUMBERS
Finances
Ohio WRC leverages federal dollars. Last year, every federal dollar invested was leveraged with six dollars from other sources. Eighty-five percent of these funds were used for research and to provide research experience opportunities to 19 students in disciplines related to water resources.

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