**EXECUTIVE SUMMARY**

As a part of National Institutes for Water Resources, The Ohio Water Resources Center (Ohio WRC) is the federally-authorized and state-designated Water Resources Research Institute for the State of Ohio. We enable and conduct State-relevant water resources research; foster collaboration among academic researchers, governmental bodies and water professionals; train the next generation of water scientists and educate the public on water resources issues in the State of Ohio.

**2016-2017 ACTIVITIES**

**Nutrient Removal Technologies**
The increased occurrence of harmful algal blooms in Lake Erie and other Ohio lakes and rivers over the past few years has drawn significant attention due to their severe impacts on human health, aquatic ecosystems and the economy. The U.S. and Canadian governments called for a 40-percent reduction from 2008 levels in phosphorus runoff from farms and other sources into Lake Erie. In order to achieve this goal, Ohio WRC researchers investigate novel technologies to remove nitrogen and phosphorus from agriculture drainage and wastewaters to reduce nutrient loads and in turn, HABs prevalence.

**Current Projects**

Utilizing Industrial By-Products for Nitrogen and Phosphorous Filtration from Agriculture Drainage  
*Chin-Min Cheng, OSU*

Optimizing Nutrient Removal from Wastewater by Optimizing a Novel Vertical Membrane Bioreactor  
*Soryong Chae, UC*

Field Testing a Phosphorus Interceptor for Tile Drainage in the Lake Erie Watershed  
*Darryl Dwyer, UT*

**Algal Blooms**
Harmful algal blooms (HABs) in Lake Erie are the result of excess input of nitrogen and phosphorus from agriculture watersheds in northwest Ohio. The streams that deliver these large loads of nutrients have the ability to slow or prevent nutrients from entering Lake Erie through biological processes like assimilation and denitrification. Ohio WRC researchers work to understand the relationship between algal bloom formation, temperature, and nutrient concentrations.

**Current Projects**

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

Trace-Metal Limitation of Biofilm Growth Dynamics – Implications for Nutrient Removal  
*David Costello, KSU*

**Water and Energy**
Although Ohio is considered a water-rich State, the World Resources Institute recently estimated that approximately two-thirds of Ohio has “medium to high” or “high” water risk, due to increasing water demand and changes in climate patterns. Therefore, on-going water conservation is essential to maintain available supplies during drought periods when shortages are most likely to occur. Ohio WRC researchers work on many tiers of water conservation from developing next-generation water conserving buildings to decreasing water use during energy extraction.

**Current Projects**

Optimization of Simultaneous CO₂ Sequestration and Enhanced Water Recovery from Saline Ohio Aquifers  
*Jeff Bielicki, OSU*

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

Quantification of Ohio’s Methane Emissions from Lakes and Shale Gas Development  
*Gil Bohrer, OSU*
2016-2017 BY THE NUMBERS

Finances
Ohio WRC leverages Federal dollars. Last year, every one federal dollar invested was leveraged with five dollars from other sources. Eighty percent of these funds were used for research and providing research experience opportunities to ten students in different disciplines related to water resources.

Outreach
Ohio WRC is teaching water professionals, educators, citizens, and the next generation to be water smart. Working with partners and Ohio citizens, we support a range of projects that involve citizens in monitoring water quality in Ohio streams and lakes. Furthermore, we educate citizens to make informed decisions and use sustainable methods and technologies to protect our water resources. Connecting scientists and professionals with citizens enables creation of strong mutual partnerships that will help solve current and future water resources issues in the State.

Current 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

ADVISORY BOARD
The distinguished members of our Advisory Board provide critical expertise and guidance for advancing our work across all areas.

Mike Baker
Division Chief, Ohio EPA, Division of Drinking and Ground Water

Kathryn Bartter
Director, OSU, Office of Energy and Environment

Ken Heigel
Chief Engineer, Ohio Water Development Authority

James Morris
Director, US Geological Survey, Michigan and Ohio Water Science Center

Randy Moses
Associate Dean for Research, OSU, College of Engineering

Gregory Nageotte
Program Specialist - Watershed, Ohio Department of Agriculture

Jeffery Reutter
Special Advisor, Ohio Sea Grant

Ohio WRC sponsors the WMAO annual conference
5th grade students in Columbus learn about water and buoyancy at the Central Ohio Children’s Water Festival
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.

Adopt Your Waterway volunteers attend training sessions which enable them to measure varying parameters of stream quality around Ohio

Ohio American Water Works Association (OAWWA)
Ohio Sea Grant
Ohio Water Development Authority (OWDA)
City of Columbus Public Utilities
U.S. Geological Survey (USGS)

Ohio Water Resources Center

Friends of Lower Olentangy Watershed (FLOW)

University Researchers

Mid-Ohio Regional Planning Commission (MORPC)
Office of Energy and Environment (DEE) at OSU
Ohio Environmental Protection Agency (OEPA)
National Institutes of Water Resources (NIWR)
Citizen Volunteers

Ohio Water Resources Center

University of Toledo
Bowling Green State University
Kent State University
University of Akron
University of Cincinnati
Ohio Northern University

Adapt Your Waterway volunteers attend training sessions which enable them to measure varying parameters of stream quality around Ohio

FUNDED UNIVERSITIES
Locations with recently funded Ohio WRC projects

Ohio Water Resources Center
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CONTACT INFORMATION

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