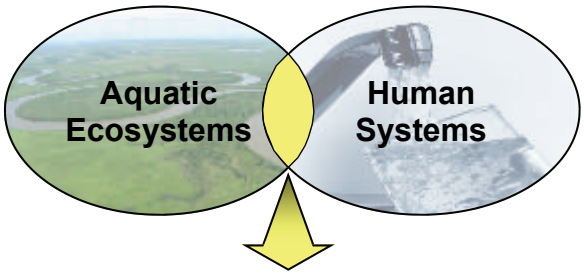
Michigan State University

Center for Water Sciences

Water is essential for life.

This simple statement belies the complexity of water resources. Aquatic systems are coupled systems, meaning that human and natural elements are intimately linked. Water resources support a vast array of aquatic ecosystems and supply many services to humans including flood control, pollutant removal, and drinking water. However, the growth in the human population has led to an increased demand for and degradation of water resources. Both ecosystem health and human health have been affected, often by the same contaminant sources and stressors. We believe that collaborative, interdisciplinary research provides the breadth of expertise and inspires new ideas needed to solve the complex water problems that we face now and into the future.



CWS
Center for Water Sciences

CWS works at the interface of human and natural aquatic systems

Who We Are

The Center is an MSU Research Excellence Funds Center. CWS research addresses a variety of water science topics including waterborne pathogens, nonpoint source pollution, aquatic ecosystem assessment, and land-water interactions.

Our Expertise

CWS draws on the expertise of over 80 faculty members from multiple departments across campus, from Anthropology to Zoology.

Our affiliated labs have the capacity to analyze and assess water for almost any contaminant, including:

- Indicators of fecal contamination, such as *E. coli* and enterococci
- Waterborne pathogens
- Nutrients, metals and toxins
- Algae and algal toxins

What We Do

- Advance scientific research and knowledge for understanding, protecting, and restoring water resources and their sustainable use by humans and ecosystems.
- Investigate and provide solutions to environmental problems facing our natural and human water systems.
- Provide technical assistance to state and federal agencies
- Work with local communities in the Great Lakes to address water quality problems
- Encourage dialogue on important water issues and translate science to those outside academia through our Water Fellows program

Center for Water Sciences
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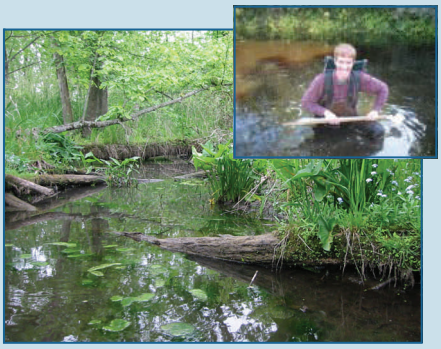
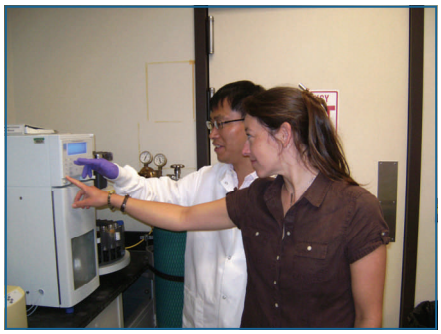
CWS Research Highlights: Our Faculty Members at Work

Understanding Nutrients



CWS researchers Steve Hamilton and Jon O'Brien (pictured above) have developed innovative methods for studying how wetlands change the content of nitrogen and other nutrients in water passing through them. This is important because wetlands are "hot spots" for nitrogen removal and affect water quality.

Emerging Contaminants



CWS faculty member Alison Cupples and post-doc Jongmun Cha (above) developed a rapid analytical method for the determination of antimicrobial compounds in biosolids and agricultural soils. This is critical for advancing science because there is currently little information available on the occurrence and fate of these compounds in biosolids, representing a significant knowledge gap because 50% of all US biosolids produced are applied to land.

Tackling an Invasive Fish

The sea lamprey is a vicious predator of large-bodied fishes that invaded the Great Lakes early in the 20th century and devastated a vibrant fishery. CWS faculty member Michael Wagner is examining how a lamprey tracks, evaluates, and selects or rejects a candidate spawning river, and to see if we can manipulate that response to control the sea lamprey population. In the picture above, his students track a tagged sea lamprey in Lake Huron.

CWS funds and conducts research on a wide variety of water topics to provide the science needed to understand, protect and restore human and natural aquatic systems

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