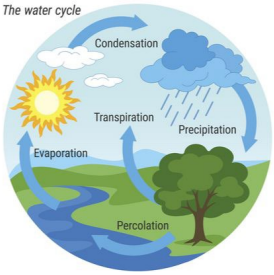
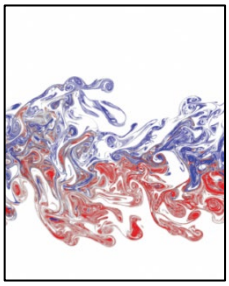
# Boase Seminar Series in Hydrology and Water Resources Engineering

## Department of Civil, Environmental and Architectural Engineering



# Leveraging Hydroclimatic Processes and Satellite Remote Sensing for Monitoring and Forecasting of Harmful Algae in Small Inland Lakes


## & Mr. Max Beal, Ph.D Candidate

## Department of Civil and Environmental Engineering

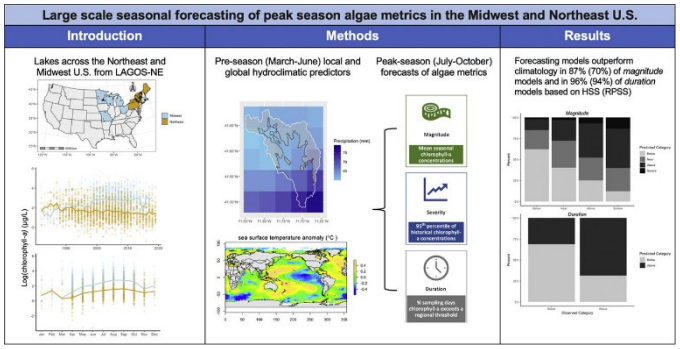
## University of Wisconsin-Madison, WI


**Wednesday, March 1, 2023 | 11:15 AM | ECCE 1B41 &**

**Zoom: https://cuboulder.zoom.us/j/98861379124**

**(passcode: water)**


## Abstract:




Hydroclimatic variability can have a pronounced influence on public and ecosystem health through water quality. In many regions variability in water quality presents a notable challenge to water managers and public health officials who must allocate limited resources to manage uncertain outcomes. To adequately address the consequences of uncertainty in water quality on ecosystem and public health, officials are in need of novel methods to manage water quality, and downstream impacts, in vulnerable regions. Harmful algae has become a prominent water quality concern in recent years as anthropogenic disturbance of nitrogen and phosphorus cycles has resulted in widespread eutrophication, leading to an increase in the prevalence of algae in many waterbodies. In particular, the proliferation of algae in surface freshwaters has negative consequences for ecosystem function, economic opportunity, and human health due to the potential for toxin production in some species. This work explores the application of hydroclimatic processes for the development of seasonal forecasts of peak season harmful algae metrics in 178 lakes across the Northeast and Midwest U.S. and the potential for satellite-based monitoring systems to retrieve harmful algae indicators in hypereutrophic Lake Mendota with the goal of improving management, resource allocation, and public health related to lake water quality.


**Speaker(s) Bio: Mr. Max Beal** is a PhD Candidate in Civil and Environmental Engineering, advised by Dr. Paul Block in the Water Systems and Society lab at the University of Wisconsin – Madison. His research is focused on hydrology, climate variability, and impacts on water quality with an emphasis on forecasting and remote sensing. Max helps to develop season-ahead forecasts and satellite-based monitoring tools for harmful algae to inform lake management and public health decision making.

**Dr. Paul Block** is an associate professor in civil and environmental engineering at the University of Wisconsin – Madison. His research focuses on hydroclimatology and water resources systems, with a goal to couple climate, hydrology, and management models and knowledge to reduce risks and promote sustainability of water resources for societal benefit. He is involved in many national and international projects that promote season-ahead forecasts as a means to inform decision-making, with applications to reservoir operations, agricultural planning, water quality assessment, and disaster management. He also has extensive experience as a licensed civil engineer working on groundwater protection and extraction, landfill management, and storm water control projects.