

## **Slide 1:**

Chairman Hoops and members of the subcommittee, thank you for this opportunity to testify before you today. I serve as the director of the newly formed Center for Great Lakes and Watershed Studies at Bowling Green State University. I am the co-chair of the National HABs Committee and serve on the US EPA's Board of Scientific Councilors. Bowling Green State University has a team of 10 researchers conducting a wide range science currently focused on helping solve the many water quality issues Ohio faces. Our team conducts work that spans the watershed to lake continuum that I cannot cover in these three minutes but do have a folder for each member that describes several of these projects.

Today, I am going to highlight the important role BGSU plays in addressing harmful algal blooms throughout the state. First, our work has been critically important in showing that nitrogen is an important driver of bloom toxin concentrations as well as bloom growth in western Lake Erie. Therefore, nutrient management strategies must include nitrogen, not just phosphorus. Second,

BGSU, in collaboration with my colleagues from Ohio State and Toledo as well as state and federal agencies, created the first-ever framework for developing a quantitative metric for determining the impairment status of a large lake suffering from harmful algal blooms as stipulated in the Clean Water Act. This partnership shows why state, federal and academic partnerships are important while also highlighting the critical need for sustained long-term monitoring. Finally, climate change will impact Lake Erie's harmful algal blooms. Warmer spring and fall temperatures will cause the bloom to begin earlier and last longer.

## **Slide 2**

While great strides in our understanding of harmful algal bloom ecology have been made, many challenges remain. For example, we know a lot about the ecology of the *Microcystis*-dominated blooms in western Lake Erie but we know less about the blooms that occur elsewhere in Ohio. Also, there are cyanobacterial toxins of emerging concern being detected throughout Ohio but we do not know who is producing them or the environmental

triggers for their production. We know that long-term monitoring, that incorporates citizen scientists and advanced technologies, is critical as we cannot assess the impacts of watershed management actions or a changing climate without these sustained efforts.

So what are some paths forward? BGSU was recently awarded a 5-year \$5M NIH/NSF funded Center for Oceans and Human Health, one of four in the nation, this is a collaborative effort between many of the best universities that study harmful algal blooms including Ohio State and University of Toledo. BGSU is also leading a project, funded through the Ohio Department of Higher Education, that collaborates with several other Ohio universities to start to understand who is producing these toxins of emerging concern and what may cause their increase. Furthermore, long-term watershed and in-lake monitoring are important components of an adaptive management approach and I urge the members of the subcommittee to remember our past mistakes. As the water quality of Lake Erie improved throughout the 1980s, the lake was considered 'fixed' and many

critical in-lake monitoring programs were significantly reduced. Therefore, we do not fully understand the environmental changes that occurred in the lake that led to the reemergence of the blooms we see today. Finally, we need to continue to get more Ohioans involved in our science. Working with citizen scientists is a proven method for expanding the scope of our science. I have included in your folders a collaborative proposal between BGSU, Ohio State and University of Toledo that will accomplish this goal. By partnering with Ohioans, we will be able to expand our science and create more informed citizens, both of which are important factors to obtaining our long-term goals. This is my testimony, thank you for your attention.