

**Joint House Agriculture and Rural Development and Senate Agriculture
Committee Meeting
Senate Bill 1 Review
Greg Labarge, College of Food, Agricultural and Environmental Sciences
The Ohio State University**

Chairs Hill and Hackett, Vice Chairs Koehler and Hoagland, Ranking Members Patterson and O'Brien, and members of the House Agriculture and Rural Development and Senate Agriculture Committees, thank you for the opportunity to testify this morning. I am Greg Labarge, Associate Professor, Field Specialist, Agronomic Systems and Co-Coordinator of the Agronomic Crops Team for the College of Food, Agricultural, and Environmental Sciences (CFAES). CFAES is the founding college, or the Cornerstone College of The Ohio State University.

The disciplines in agriculture and environmental studies are leading the way toward new solutions for the issues that are plaguing Lake Erie. The faculty and staff of CFAES have also played a critical role in the implementation of Senate Bill 150 and helping farmers comply with regulations imposed by Senate Bill 1. Much more is being done in the form of private/public partnerships between CFAES, USDA, The Nature Conservancy, the Ohio Farm Bureau, and Ohio Commodity groups like the Ohio Small Grains Marketing Board, Ohio Soybean Council, and the Ohio Corn Marketing Board.

Proposed investments in Ohio State University's Stone Lab and the Ohio Sea Grant Program will increase our capacity to study algal blooms and to assess changes that accompany nutrient reductions to Lake Erie. Both the lab and Ohio Sea Grant are essential to the state's efforts to assess Lake Erie's health and inform management decisions. It should be noted that the amount of baseline data collected in Lake Erie and its tributaries has and continues to suffer from lack of financial support.

- Ohio Sea Grant has organized and leads an NSF funded research consortium that links universities across the state (LEARN: Lake Erie Area Research Network). This capital investment will support this effort and increase its research capacity.
- The location of the lab in the middle of the Western Basin provides a strategic platform for monitoring and addressing both nearshore and offshore issues.
- Stone Lab and Ohio Sea Grant continue to be trusted, fact driven and unbiased resources for the state both from a research and education/outreach capacity. Data generated by these two programs are publicly available and often referenced.
- This investment in state-of-the-art research lab space will increase the capacity to collect and process needed water samples, conduct experiments on bloom dynamics (e.g., size and movement), and to assess trends in toxicity. Not only will this addition help us address the nutrient loading and HABs issue of today but it will also support research efforts that would address current and future lake stressor (e.g., pharmaceuticals, plastic debris, etc.) and assess ecosystem stability (e.g., invasive species, fisheries science, lake dead zones, etc.).

- This investment will allow visiting researchers to spend large portions of the bloom seasons (July through October) at the lab conducting continuous experiments and taking regular samples. It is clear that these capital improvements will not only support OSU researchers but will be an asset to numerous colleges and universities across the state and region; annually 60+ researchers from across the state and region conduct experiments and/or collect data using the lab.
- A portion of this investment will also support real-time data buoys and sensors that will allow the lab to gather information in key locations around the lake informing agencies and stakeholders of bloom and nutrient trends. Further, the buoys can provide the data regularly requested by NOAA and other state and federal agencies to aid in short and long-term lake forecasting (e.g., water mixing, water levels, wind speed and direction, wave height, water temperature, etc.). These data, for example, would allow operators of public drinking water systems to know the condition of the water entering their facility in real time allowing them to adjust treatment accordingly.
- State investment in Ohio Sea Grant demonstrates its commitment to address Lake Erie water quality issues, and leverages baseline federally funding to increase the impact of its work on the HABs issue. Financial support from the legislature helps bolster the argument for continued and increased support of the federal Great Lake Restoration Initiative (GLRI).

As many of you are aware, our college faculty represent perhaps the largest and most active group of people conducting research, teaching and outreach/extension on water quality issues in the state. As a land grant university, we take our responsibility seriously to provide scientific advice and support to address pressing problems in Ohio. Last fall, Dean Kress named Doug Jackson-Smith to lead a CFAES Water Quality Task Force which is designing an initiative to increase the coordination and impact of our colleges work on water quality. The Task Force is currently engaged in discussions and meetings with our faculty and with a broad range of external stakeholders to identify priority topics and activities that will be incorporated this Water Quality Initiative, which we anticipate will be launched this fall.

This spring, the Task Force also formed a working group that consists of nearly all of the college faculty working on the Lake Erie / Harmful Algal Blooms issue. The working group is drafting a synthesis document that will summarize the critical lessons to be drawn from CFAES scientists' research projects and extension programs. This synthesis will build on the 'white paper' that several of our faculty helped draft last fall.

While our work is ongoing, I can give you a brief overview or 'highlights reel' of some of the important contributions the CFAES is making to help the state grapple with the serious challenge

- Jay Martin and Margaret Kalcic (both professors in FABE) are leading an effort to build watershed models for the Maumee River Watershed that can simulate the impact that different combinations of best management practices are likely to have on our ability to meet the 40% reduction target for P-losses to Lake Erie. This effort is noteworthy because it combines the efforts of multiple modeling teams from different universities, and thus provides a more robust assessment of BMP performance. The project also has convened a stakeholder advisory group to ensure that model development and scenarios choices are reviewed by key farm and

environmental organizations working in the basin, and connected to local, state, and federal agencies that conduct oversight on the Lake Erie puzzle.

- College researchers have led the development of two critical decision-making tools that should help increase the ability of farmers to assess the benefits and impacts of their management practices. First, Dr. Steve Culman is completing a three-year project that will update the Tri-State Fertility Recommendations for the first time in nearly 25 years. His work suggests that farmers can be more conservative in their use of many fertilizer nutrients without fear of loss of crop yield. Similarly, Dr. Libby Dayton has developed a new Phosphorus Index (or P-Index) tool based on data collected from Ohio farm fields. The P-Index will allow farmers to estimate the potential phosphorus losses from each of their farm fields based on actual field conditions and management practices. The P-Index tool can also let farmers identify the changes in farm management approaches that would yield the highest level of reduction in P runoff. We expect a roll-out of both the new fertilizer recommendations and the P-index later this summer.
- CFAES researchers are global leaders in the development of innovative ‘precision-agriculture’ technologies and systems that allow farmers to more accurately target their nutrient applications to ensure that they increase crop yields while reducing nutrient losses to waterways.
- While among the leaders in the field, our CFAES faculty regularly collaborate with a wide consortium of actors across campus and beyond. We have built partnerships with Heidelberg University, the Great Lakes Commission, Bowling Green University, and the University of Toledo to combine expertise from around the state to address the Lake Erie/HABs challenge. Together we have built an expanded network of on-farm and tributary or watershed monitoring sites that helps us identify critical landscapes and sub-watersheds. It also enables us to track whether interventions made under these new programs have the anticipated impacts. The maintenance and expansion of this water quality monitoring network is essential to increasing our understanding of the drivers of nutrient losses from our rural landscapes, and to document the impacts of interventions and progress toward meeting our state’s nutrient loss reduction goals.
- One specific topic I would like to highlight is the issue of in-stream processes that influence the link between what comes off the farm (at the edge of the field) and what comes out of the mouth of the Maumee River. We remain concerned about the lack of information available to us about how the forms of phosphorus are transformed in the stream. For example, the data available to our researchers indicates that sediment-bound phosphorus remains a large part of the problem at the edge of the field. However, something is happening during the time the sediment (attached to the phosphorus) is transferred up the river. We are now aware that the phosphorus is detaching and becoming more available to algal growth.

Changing farm practices can often be difficult, and balancing the economic realities of survival in an intensely competitive marketplace with the goals of improving the environmental performance of agriculture can be a huge challenge. Farmers need an objective and capable source of information to help guide their decisions as they negotiate these transitions. OSU Extension remains one of the most trusted partners in this area, and our work builds on a century-long track record of proven results that have benefited our state’s farmers and the environment.

To respond to growing awareness and concern about the role of nonpoint source pollution in Ohio's waterways, Ohio State Extension organized the "Nutrient Stewardship for Cleaner Water" program and has played a vital role in the delivery of science-based information farmers need to make responsible nutrient management decisions. Over the past three years, OSU extension took the lead on providing Fertilizer Applicator Certification Training to nearly 17,500 Ohio farmers. This training is mandated as a direct result of S.B. 150, but it was also a part of Extension's Nutrient Stewardship for Cleaner Water Program. The initiative was designed to improve water quality by helping growers reduce the amounts of nitrogen and phosphorus used and keeping more of it on the field.

Extension has accomplished four goals through the program:

- Conducting on-farm and field trials of best management practices involving application methods, timing and nutrient application rates.
- Promoting use of organic and inorganic nutrient sources for optimal crop production.
- Developing a hands-on tool that growers and producers can access to find recommendations for best management practices specific to their needs.
- Promoting the adoption of soil testing and Tri-state fertilizer recommendations for agronomic and other crops and optimize the efficiency of fertilizer use with the 4R concept: Right fertilizer source, at the Right rate, at the Right time, and the Right place.

Extension continues to be a key neutral and objective voice in the state to facilitate the adoption of proven best management practices. Our accomplishments are even more impressive when you factor in the reduction in state resources and new mandates that have been added to our plate in recent years. Our network of OSU Extension specialists and county educators are key partners in any future effort to implement the new guidelines and management practices. We would encourage the state to provide additional funding to support OSU-Extension programs that will be critical to the ultimate success of the reducing nutrient loading in our lakes and rivers.

Thank you for the opportunity to testify. I am happy to answer any questions.