

CFAES WATER QUALITY INITIATIVE PROPOSAL

Water Quality Task Force
January 2019

INTRODUCTION:

In the fall of 2017, Dean Cathann Kress appointed an 8-person task force¹ to develop a proposal for a Water Quality Initiative (WQI) for the College of Food, Agricultural, and Environmental Sciences (CFAES). This effort was motivated by a desire to increase the visibility and impact of research, teaching and extension/outreach efforts by CFAES faculty and staff to address Ohio's water quality challenges.

The goals for the CFAES Water Quality Initiative are to **enable the college to provide leadership and support for an integrated program of water-related research, teaching, and outreach to address current and future water quality issues in Ohio.** We seek to do this by:

- (a) Leveraging existing assets and CFAES' strong talent pool in water quality to help generate new resources in order to increase development and dissemination of scientific knowledge on critical water issues in the state;
- (b) Supporting efforts to document changes in water quality and key drivers (e.g., land use, management behaviors, climate, etc.) across time and space through impactful research and expanded monitoring activities;
- (c) Strengthening collaborations among OSU, other universities, stakeholders, private partners, agencies, and other decision-makers to ensure research and outreach programs are relevant and impactful; and
- (d) Expanding opportunities for training students and practitioners in the knowledge and skills required for effective adaptive management of water-quality challenges.

The Water Quality Task Force (WQTF) has met regularly over the last 8 months and used surveys, interviews, open forums, and focus groups to gather suggestions and input from a wide range of faculty, staff, stakeholders, and policy-makers. In our consultations, we identified the large number of CFAES college faculty and staff that currently engage in a significant amount of research, teaching, and extension/outreach work on water quality (WQ). We also heard accounts from stakeholders highlighting the many ways in which CFAES programs have provided critical information and support to people working on the front-lines of addressing a wide range of rural and urban WQ challenges at the local, regional and state level.

At the same time, we learned that a substantial amount of the College's work is not as well known or as impactful as we'd like it to be. Many faculty and staff expressed interest in increasing resources to support greater research capacity and collaboration, to expand their outreach/extension activities, and to increase student training relative to WQ topics. Stakeholders wanted easier access to CFAES research, better translation of research into policy

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or practical recommendations, more boots on the ground, and leadership from the College to convene and facilitate science-based discussions to identify effective strategies to address diverse WQ problems **both in the Lake Erie and Ohio River basins**.

This document provides a high-level overview of the recommended core institutional investments, organizational innovations, and new partnerships that we believe could leverage our existing capacity and personnel to increase the relevance and impact of CFAES' research, extension/outreach, and teaching on WQ in Ohio and regionally.

Our recommendations are shaped by six guiding principles:

- I. Embrace and communicate an expansive definition of WQ, focused on diverse WQ issues and with a statewide focus (e.g., both Lake Erie and the Ohio River basins).
- II. Sustain and increase the relevance and impact of CFAES WQ work outside of the college.
- III. Enhance the capacity of existing faculty, centers, and programs to address current and future WQ needs efficiently and effectively.
- IV. Promote an integrated and coordinated approach within CFAES that links research, teaching and extension/outreach to magnify the impact, utilization and distribution of our work.
- V. Integrate and collaborate with other OSU colleges and with external partners when possible to maximize impacts and minimize duplication of effort.
- VI. Ensure the initiative can adapt to changing needs and priorities, and be sustainable through a long-term commitment from administration to faculty, staff and stakeholders.

RECOMMENDATIONS

Our proposal is designed to build on and invest in existing faculty, units, and centers [e.g., Stone Lab, Schiemeier Olentangy River Wetland Research Park (ORWRP), etc.] within the College that are actively engaged in research, teaching and extension/outreach to address Ohio's WQ challenges. We identify several specific areas where new investments in staffing and financial support for programs could be made to improve the capacity and external impact of individuals and units. We want to avoid creating a new independent center or unit that might divert or dilute resources from our existing strengths, but see value in hiring a WQI Coordinator and translational support staff to organize and implement the WQI within CFAES, and increase communication between CFAES, other OSU colleges and our external partners.

Our recommendations below are broken into four categories: (i) organizational recommendations to hire a Coordinator for the Water Quality Initiative and new support staff to help implement the recommendations outlined below; (ii) strategic investments that increase support for WQ programming led by individual faculty and existing centers and units in the college; (iii) expanded efforts to coordinate and collaborate with external organizations, institutions, and other partners to enhance statewide WQ programs; (iv) additional projects requiring coordination with other CFAES or OSU units.

I) **LEADERSHIP & TRANSITION**

The Task Force's mission was to outline a major WQ initiative for CFAES. Through our efforts, we believe the next step should be to formalize the institutional leadership and organizational structures to effectively design and implement our recommendations. This will involve two key steps:

1. Dissolve the Water Quality Task Force and **establish a WQI Advisory Board (WQI-AB)** comprised of faculty, staff, stakeholders, and policy-makers that will provide oversight of and direction to the WQI.
 - a. This WQI-AB should meet on a regular basis with the WQI coordinator and staff (see below, #2) to set priorities, approve major new projects, and review progress on key goals.
 - b. The WQI-AB should maintain lines of communication with and provide accountability to faculty/staff and external stakeholders on an ongoing basis.
 - c. The WQI-AB should include broad representation, including
 - i. Leaders of existing CFAES centers for water quality research, outreach and teaching programs
 - ii. Faculty/staff representation from multiple departments or units and areas of expertise, including extension/outreach and teaching and/or members of the current Water Quality Task Force.
 - iii. Stakeholders and decision-makers who represent diverse geographic regions and WQ issues
 - iv. Student representative
 - v. Ex officio representation from CFAES administration
2. Work with the WQI Advisory Board to **hire a full-time Water Quality Initiative Coordinator**.² Our vision of this position would include the following elements:
 - a. The coordinator would provide leadership and coordination for the overall initiative. With oversight from the WQI-Advisory Board, the coordinator would be responsible for obtaining support, resources, and implementing the recommendations for specific initiatives and programs, described below.
 - b. The coordinator would support, but not direct, CFAES faculty and staff efforts, and help coordinate with other college and OSU WQ programs (e.g., ORWRP, OSU Extension, Sea Grant/Stone Labs, Ohio Water Resources Center, OSU Sustainability Institute, etc.), and build stronger ties between CFAES and other important WQ programs and efforts across the state.
 - c. The coordinator should serve as a central point of contact to identify and expand linkages between CFAES faculty and external stakeholders and policy makers.

² It should be noted that one member of the WQTF opposed a new coordinator and additional staff positions because they will divert resources from implementing action items 3-13 in the report. This view was based on his reading of the feedback from stakeholders, faculty, and others that we should focus our resources on the faculty, staff, and students who ultimately do the work that engages stakeholders and society on WQ topics.

The coordinator would oversee the work of the translational team, and work closely with OSU-Extension specialists and educators. The incumbent would take a lead role to convene key actors and facilitate dialogue on important Ohio WQ topics, including creating and supporting formal forums that bring together researchers, students, stakeholders, and decision-makers.

- d. Ideally, this person would have training and experience in translating research, be collaborative and team-oriented, and be an effective public speaker and communicator. The incumbent should be familiar with diverse WQ issues, but PhD-level expertise in water quality issues/topics is not necessary; this person would be expected to be familiar with the breadth of CFAES faculty/staff efforts with the ability to connect people to the appropriate resources. The incumbent should work full-time in support of the WQ Initiative and not be expected to manage this role with teaching and research responsibilities associated with faculty positions; thus, we recommend that this they not be appointed as a tenured (or TT) faculty member.
- e. The incumbent should be provided with sufficient staff support and an operational budget to successfully implement the programs outlined below.

II) SUPPORT FOR CURRENT FACULTY & WQ CENTERS

One of the core parts of the WQI should be financial and staff support for current faculty and units to increase their ability to contribute to Ohio WQ challenges. This support should be achieved through a variety of efforts, including:

3. **Make strategic investments in translational support** to both (i) help individual faculty translate research results into formats and products that can be more readily accessed and utilized by stakeholders, practitioners, and policy-makers, and (ii) work with stakeholders and policy-makers to identify critical research questions that could be addressed by CFAES faculty and staff. We recommend hiring a core group of staff centrally that could be assigned to support different faculty or units, and would report to WQI Coordinator.
4. **Integrate CFAES research and extension efforts and leverage OSU-Extension as a key resource** in dissemination of WQ information and support for local decision-making.
 - a. Facilitate more opportunities for researchers and field extension staff to meet and discuss WQ research and programs.
 - b. Provide print and digital materials, decision-support tools and incentives to engage more county-extension educators in WQ outreach initiatives
 - c. Integrate extension roles into new campus faculty positions and/or expand the number of field extension faculty with expertise in WQ.
 - d. Expand Fertilizer Applicator Certification Training (FACT) programs to include more content and depth on WQ topics.
 - e. Reinvigorate OSU extension's role in state collaborative watershed management.
 - f. Highlight CFAES work on WQ at existing extension and outreach events.

5. **Provide expanded incentives and support to faculty and staff and new faculty lines** for targeted research, teaching, outreach and program implementation to address critical WQ problems in Ohio, including:
 - a. Increase internal funding targeted at WQ research, teaching and outreach efforts led by CFAES faculty and staff. This includes: an expanded or new SEEDs-like program, more/new equipment grants focused on WQ instrumentation, graduate-student support for WQ research, and undergraduate and graduate training related to Ohio WQ problems.
 - b. Improve efficiency and reduce administrative burdens on faculty working on WQ issues to free faculty time for research and outreach through: (a) expanded support for proposal development to leverage more external resources for research and extension work on WQ (e.g., increased WQ grant-development support through the GDSU), and (b) improved post-award support either at the unit level or centrally.
 - c. Invest new resources to make strategic faculty hires to fill critical gaps to meet priority WQ challenges. To accomplish the goals outlined in this proposal, we anticipate the need to provide expanded capacity in both research and extension/outreach positions.

While direct support for individual faculty will be important, a key component of the WQI should be to capitalize on the strengths and capacity of existing CFAES centers that focus on WQ issues in Ohio. For example, Stone Lab in Lake Erie, and the ORWRP in the Ohio River basin have strong research, outreach, and teaching records related to a suite of WQ issues and ecosystems. Stone Lab, the university's island campus, is ideally located to address large lake, open water issues, environmental and economic, driven by diverse watersheds. Because of its urban location, the ORWRP is uniquely positioned to address complex questions related to coupled human-natural systems. The ORWRP's location within the Ohio River basin makes it a natural focal point for WQ issues related to the Ohio River and its watersheds. Existing analytical labs [e.g., the Soil and Water Environmental (SWEL) Lab, Service Testing and Research (STAR) Lab, etc.] can also be used to support CFAES WQI efforts.

As such, we recommend supporting and coordinating with these centers through new WQI investments where possible.

6. **Enhance capacity of these and other relevant centers** to elevate CFAES and OSU WQ research, implement extension/outreach programs, and inform water management decisions by:
 - a. Increasing coordination of these centers around WQ programming.
 - b. Enhancing the WQ outreach footprint of these centers by hiring/assigning extension personnel to assist with extension/outreach programming.
 - c. Relying on these centers to lead strategic investments in expanded WQ monitoring, instrumentation, and analytical capacity within CFAES.
 - d. Increasing opportunities to connect work at these centers with municipal, state, and federal agency personnel.

These existing centers fill crucial WQ needs related to basic and applied research, extension/outreach and student training. However, CFAES currently lacks a coordinated capacity to lead research, analysis, and engagement to develop effective water quality policies in Ohio. Currently, policy research, training, and analysis is conducted across multiple units in the college, including, but not limited to, AEDE, SENR, FABE, ACEL, and Extension. Individuals in these units have collaborated on research and outreach efforts that have helped promote awareness about water quality issues and identify effective policy responses.

To increase the coordination and impact of this work, and to strengthen the ability of state and local policy-makers to address current and emerging WQ issues, we make the following recommendation:

7. Establish and sustain an **Ohio Water Quality Policy Research and Engagement Center**.
 - a. This Center would conduct policy research and analysis to design results-based policy approaches to address emerging sustainability challenges on WQ issues.
 - b. The Center would better coordinate and expand CFAES research and engagement on a range of WQ policy topics including ecosystem services assessment and valuation, experimental design of watershed restoration approaches and policy designs, integrated assessment, development of novel WQ policies (e.g., water quality trading), and other WQ areas.
 - c. The Center could lead efforts to engage local, state, and regional decision-makers, and coordinate with CFAES faculty, existing centers, and college leadership to bring attention to implications of alternative approaches to policy design and implementation.

III) COORDINATE WITH OTHER INSTITUTIONS TO FACILITATE STATEWIDE PROJECTS.

These following specific project ideas have support from the Water Quality Task Force and faculty, staff and stakeholders who provided input to our process, but to succeed they would require close coordination and partnerships with people and organizations from outside the CFAES (and new funding sources) to do one or more of the following:

8. Lead or support efforts to **build and sustain an integrated statewide Ohio Water Quality long-term monitoring program**.
 - a. Work with other research institutions, federal, state and local governments, and private sector actors to coordinate current efforts and identify priorities for expanded monitoring.
 - b. Seek resources to expand biological and physico-chemical in-stream or in-lake water monitoring networks and also to collect longitudinal data on associated land use changes and land management activities that affect WQ outcomes.
 - c. Serve as a trusted objective partner to design methods and secure data management systems to track progress in adoption and implementation of WQ best management practices in agriculture.

9. Lead or support efforts to **expand capacity to evaluate impacts of Best Management Practices (BMPs) at both site and watershed scales.**
 - a. Work with partner institutions to expand edge-of-field (EOF) research sites and other on-farm research projects to do scientifically valid research to explore the effectiveness of BMPs under real-world working farm conditions. This expanded statewide network would be designed to cover more diverse landscapes, farming systems, and practices.
 - b. Work with partners to create an Ohio Discovery Farms (ODF) program to integrate and coordinate EOF and other on-farm research. The ODF would have an advisory group to ensure broad stakeholder input and oversight. The ODF could also serve as a venue for farmer-led discussions and demonstrations, and provide opportunities for scientists, farmers, and decision-makers to interact.
 - c. Work to evaluate urban watershed sector impacts on water quality and associated BMPs. Storm water and urban landscape management are examples of areas of potential collaboration.
10. Provide support and leadership to establish statewide **Scientific Working Groups to assess the state of current science** on pressing WQ challenges in Ohio.
 - a. This would require staff leadership and financial support for literature review, writing/synthesis, and logistics (e.g. interfacing with existing external groups).
 - b. Inclusion of scientists from across OSU would be important along with other institutions of higher education and state and federal agencies in Ohio.
 - c. Topics would likely change across time. Initial work might focus on statewide issues such as Harmful Algal Blooms and Urban Stormwater Management.

IV) ADDITIONAL RECOMMENDATIONS:

While the above elements should receive priority in the new Water Quality Initiative, we also recommend that the WQI Coordinator and Advisory Board pursue opportunities to advance the following efforts that will require supporting the efforts of or developing partnerships with other OSU and CFAES units:

11. Initiate conversations and planning to **create a new integrated WQ training curriculum at Ohio State.**
 - a. This might start as a certificate, but could develop into something more. Could be run as a college-only effort, but would be worth exploring options to integrate courses and faculty from other colleges.
 - b. Requires market research to test student demand and identify workforce needs.
 - c. Possible tracks could involve Agronomic BMPs; Urban Infrastructure; Wastewater; Economics and Policy; and Watershed Science.
 - d. Explore coordination with the OSU sustainability education and learning committee; OSU workforce development and technical training efforts; OSU Extension certification programs, and the Environmental Studies Graduate Program (ESGP).

12. Work with CFAES and OSU facilities managers to **better utilize CFAES and OSU properties** to advance WQI goals. This could include:
 - a. Conduct an audit of the WQ footprint of CFAES properties and facilities.
 - b. Identify opportunities to use our own operations as a role model for implementation of management practices designed to improve WQ outcomes.
 - c. Identify opportunities to use our diverse campuses and research facilities across the state as sites to provide education and facilitate local discussions about WQ challenges.