



Summary of Key Water Quality Activities in the College of Agricultural Sciences 2017

Water quality in Pennsylvania is a top priority for the Penn State College of Agricultural Sciences and Penn State Extension. A crosscutting team of educators and specialists has come together to bring in-demand resources to individuals and communities needing help with agricultural water quality issues, urban stormwater management, and drinking water safety. The team has been meeting with stakeholder groups across the Commonwealth to hear feedback regarding current programming and future needs assessment.

Analysis of the Pennsylvania Farm Conservation Practices Inventory for Purposes of Reporting Practices to the Chesapeake Bay Program

There is much interest in the extent of the use of water quality protection practices in Pennsylvania agriculture. Conservation practice adoption is well-documented for practices that are implemented with federal or state financial assistance. Yet, while it is known that farmers adopt water quality protection practices without public financial support, there is no systematic accounting for these investments. In consequence, these self-financed practices are not accounted for in tracking the progress towards water quality goals, including cleaning up the Chesapeake Bay.

A survey was conducted in early 2016 by the Penn State Agriculture and Environment Center with funding from the Pennsylvania Department of Environmental Protection (DEP), and with collaboration from the Pennsylvania Farm Bureau, Penn Ag Industries, Professional Dairy Managers of Pennsylvania, the Pennsylvania Department of Agriculture, the Pennsylvania State Conservation Commission, Pennsylvania Association of Conservation Districts, and Penn State Extension. The survey was designed specifically to provide data on self-funded high priority practices.

The survey of Pennsylvania farmers in the Chesapeake Bay watershed was conducted to provide them an opportunity to self-report conservation practices implemented on their farms. The survey especially sought data on “voluntary,” non-cost shared practices. The survey instrument and procedures were developed in collaboration by survey research experts in Penn State’s Survey Research Center, and subject matter experts from state agencies and agriculture. The survey development and implementation process was led and managed by the Agriculture and Environment Center (AEC), Penn State University, College of Agricultural Sciences.

The survey was mailed to approximately 20,000 farmers in late January 2016, with returns accepted until the end of April 2016. A total of 6,782 were completed and returned.

To assess the reliability of the self-reporting, approximately 10 percent of returns were selected randomly for on-farm verifications conducted by trained and experienced Penn State Extension staff. Statistical analyses of the data reject systematic under or over reporting in the sample data for the majority of relevant conservation practices, but means and 95% confidence intervals reveal a trend toward under reporting for the vast majority of practices.

For several of these practices our analysis reveals a systematic under reporting by farmers. These include pasture acres in nutrient management plans, dairy manure storages, barnyard runoff controls, and stream bank fencing. Systematic over reporting was detected in only one practice, riparian buffers. We believe the cause of over reporting for riparian buffers was a difference between how the survey questions were asked for stream bank fencing and riparian buffers and how Penn State Extension agents were trained to record these practices during farm visits. In the case of riparian buffers, adjustments can be made to remove the resulting bias.

AG in the Balance

In March of 2016, the College of Ag Sciences organized a three-day conference attended by over 120 stakeholders working on the issues of agriculture water quality. This conference built on another the college organized in 2008 called Agriculture in the Balance that was instrumental in engaging the College in leadership around the Chesapeake Bay.

Realizing the urgency the Commonwealth is facing in meeting clean water goals, the conference provided a collaborative forum where motivated leaders in agriculture and the environment identified innovative solutions to help ensure vibrant, productive agriculture while meeting water quality goals for Pennsylvania's rivers and streams and the Bay.

Innovative ideas emerged from these discussions, including four priority initiatives which are currently being advanced. The ideas stemming from the conference have positive implications for advancing dual goals of productive agriculture and clean water in Pennsylvania, and can serve as a framework for the College's research, extension, and education opportunities around agriculture and water quality moving forward.

PA in the Balance Conference

- Steering committee members: PA Department of Environmental Protection, PA Department of Agriculture, Farm Bureau, Environmental Protection Agency, Chesapeake Bay Foundation, State Conservation Commission, PA Conservation Districts, Chesapeake Bay Commission, National Fish and Wildlife Foundation, Natural Resources Conservation Services, Penn State College of Ag Sciences and Penn State Extension
- Significant producer participation and unique structure created a new forward looking collaborative dialogue focused on solutions.
- Structure emphasized small group work to generate recommendations and action items to protect and improve water quality in Pennsylvania and the Bay
- Executive summary of full report of conference proceedings

Significant Conference Outcomes

- PA in the Balance partners are working to develop new models for funding, support legislative initiatives, increase capacity for funding through existing channels and programs
- Priority areas agreed to by executive committee and based on discussion at debriefings with DEP, PDA, EPA
 - Increase Technical Assistance Capacity and ramp up training and delivery of Technical Assistance
 - Certification program for recognition of on farm stewardship/conservation
 - Farmer to Farmer mentoring/ peer groups to influence adoption and education on BMPs
 - Targeting of resources for most effective use of limited funds and technical resources

Current work groups and initiatives

- PA in Balance Council working with DEP on Phase 3 WIP (water implementation plans) that will incorporate many of the strategies and initiatives from PA in Balance
- PDA and DEP leading effort to create accreditation or certainty program to recognize farms who are leaders in conservation with market based incentives driving farmer participation in the program
- New funding opportunity from NFWF's Chesapeake Bay Stewardship Fund. This year's funding request has call outs for Pa projects, **and specifically to advance the ideas and innovations coming out of PA in Balance**
- Ag and Environment Center, Penn State Extension, and the State Conservation Commission is leading a group to create curriculum/criteria for accelerated training program to increase capacity for farm technical assistance
- PDA, Stroud Water Research Center, and PA No Till Alliance are leading a group to examine a farm stewardship/conservation narrative/communication on soil and stream health focusing on farmer to farmer mentoring and education to help drive adoption of conservation practices. Farmers act as consultants and receive compensation

Penn State Extension Watershed Steward Program

Many watershed associations across the state are struggling to retain and recruit volunteers. With funding cuts to conservation organizations, there's not enough professional staff to protect our natural resources. According to 2014

Pennsylvania Department of Environmental Protection Integrated Water Quality Monitoring and Assessment Report, there are 15,882 impaired stream miles in Pennsylvania. Storm water management is a high priority for many Pennsylvania counties and communicates and some are turning to green infrastructure as part of the solution.

Master Watershed Steward or Master Naturalist programs have been created at other land-grant universities. Penn State Extension's program is modeled after the Master Gardener program and was piloted in 2013 in Lehigh and Northampton counties. The program has already allowed Extension to form strong, new partnerships with local conservation organizations. The goal is to secure sustainable funding for Master Watershed Steward Coordinators at Penn State Extension and hire part-time Extension employees to help support the program at the county level.

The Coordinator is responsible for facilitating local steering committee meetings, interacting with program partners, dispersing and filling volunteer requests, keeping track of evaluation metrics, and keeping the volunteers engaged.

There is currently a statewide steering committee consisting of Representatives from Penn State Extension, PA DEP, PA DCNR, Pennsylvania Environmental Council, County Conservation Districts, Trout Unlimited, and Stroud Water Research Center. The partners work towards sustainable county funding including local corporations, counties, municipal governments, program cost recovery (registration fees at workshops), and grants.

Program Requirements

- Volunteers receive 40 hours of training in water and natural resources
- Mix of classroom sessions and field trips
- Sessions are rotated around to partner organization facilities & taught by local professionals
- Programs use statewide manual with key learning objectives to structure their trainings
- After training, volunteers need to secure 50 hours of volunteer service and complete a group project
- Once they complete their first 50 hours, they are officially Master Watershed Stewards
- To maintain their title, they need to secure 20 hours of volunteer service and 10 hours of continuing education each year

Example Projects

- Educational workshops for the public, school groups, municipal officials
- Staffing displays at community events
- Riparian buffer restoration projects in partnership with county conservation districts
- Build demonstration rain gardens at municipal buildings
- Water Quality Sampling
- To date 218 Master Watershed Stewards in 13 counties: Pending: Beaver, Erie, Lancaster, Philadelphia

Penn State Extension Master Well Owner Network

There are over one million private water wells that serve farms and rural homes throughout Pennsylvania. Unfortunately, many individual water wells have never been tested and their owners are generally uninformed about proper well management. Research has shown that more than 50% of these private water systems fail to meet at least one drinking water standard.

The Master Well Owner Network is a network of trained volunteers dedicated to promoting the proper construction and maintenance of private water systems in Pennsylvania and throughout the Mid-Atlantic Region. To date, over 400 residents in 61 counties throughout Pennsylvania have been trained as Master Well Owner Volunteers. These volunteers have provided assistance to over 25,000 homeowners with private water systems.