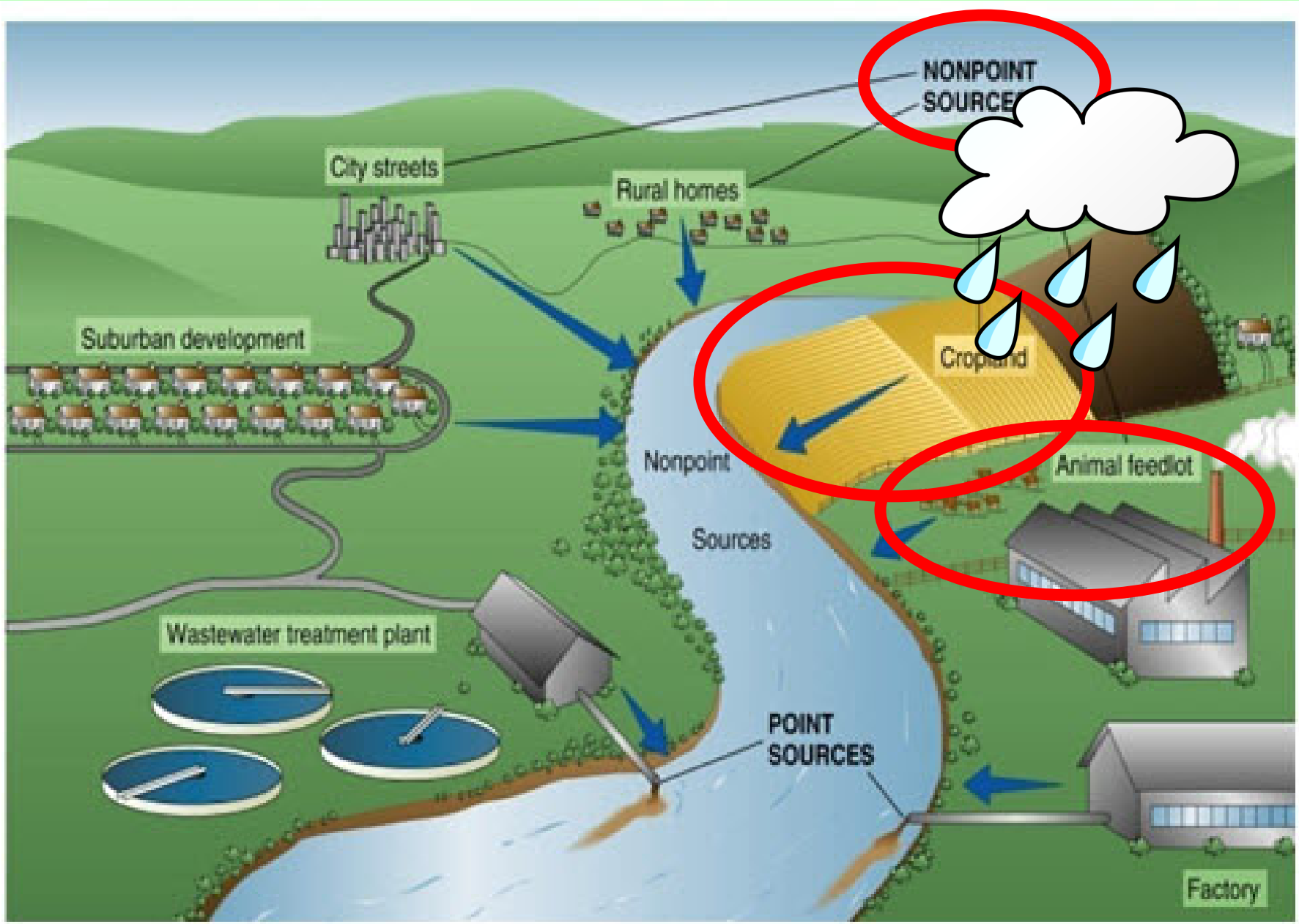
Agriculture, Nutrients, and Constructed Wetlands

Mark Patrick McGuire, Esq.
Environmental Program Manager
Association of Clean Water Administrators
Email: mpmcguire@acwa-us.org
Phone: 202-756-0604

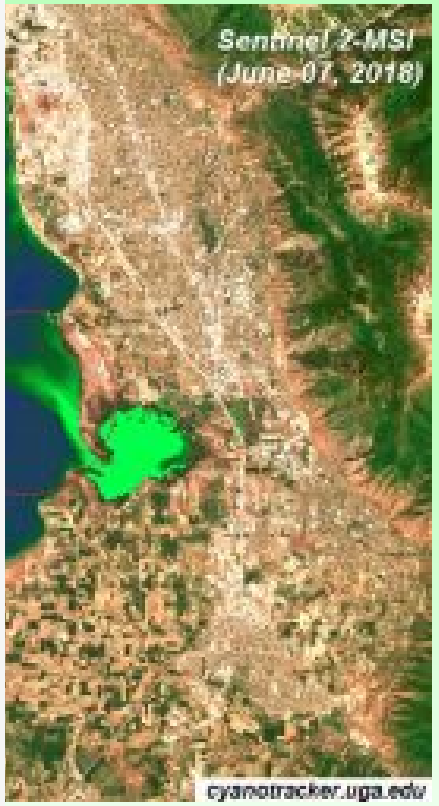
Potential agricultural sources of nutrients



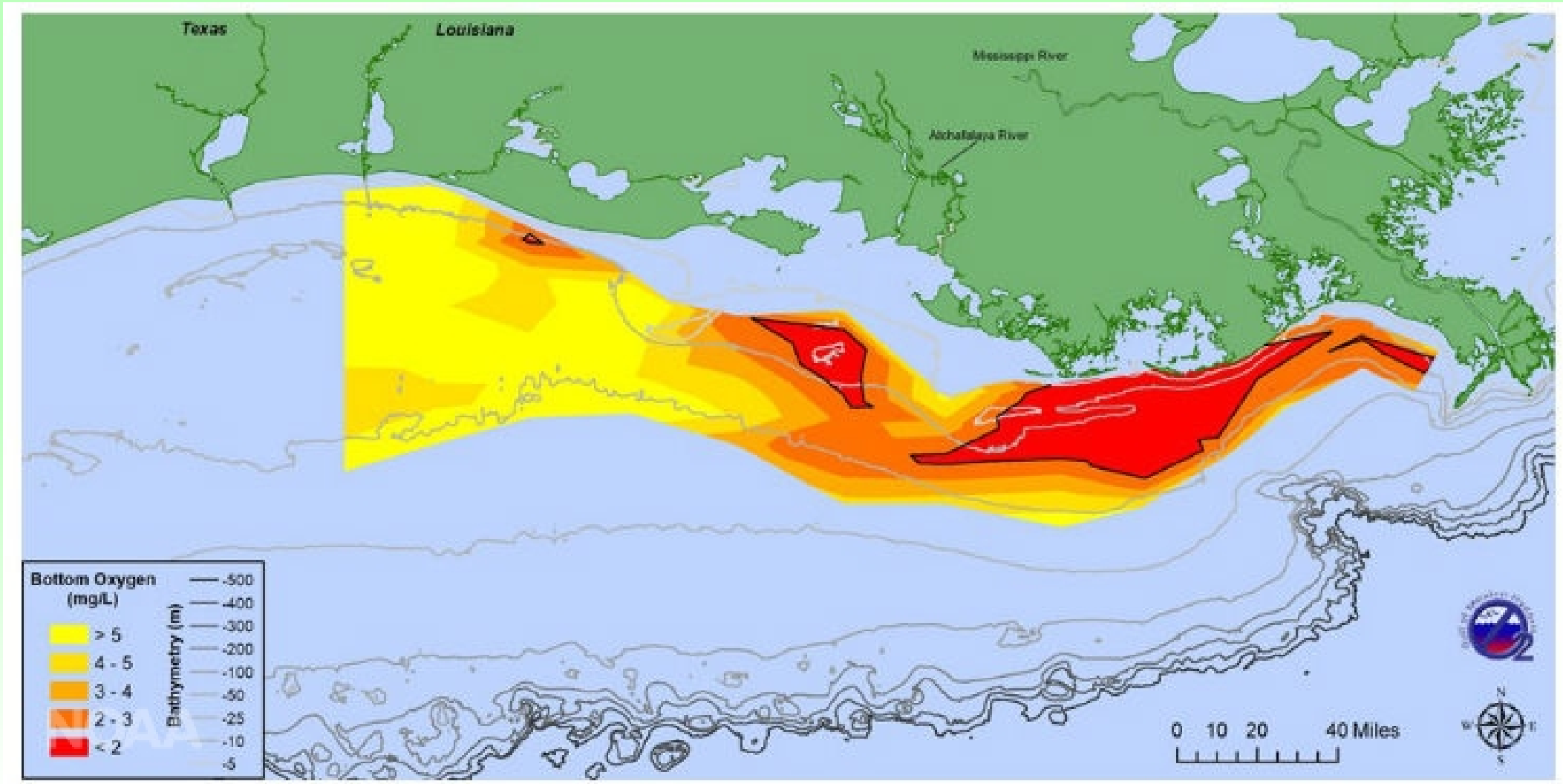
(Image: http://www.uky.edu/Ag/Entomology/PSEP/6environment.html and ecoursesonline.iasri.res.in)

Excess nutrient
excess algae gr

Lake Erie – September 2017



The algae eventually dies and decomposes.
Oxygen is consumed in the process, resulting in low levels of oxygen in the water.

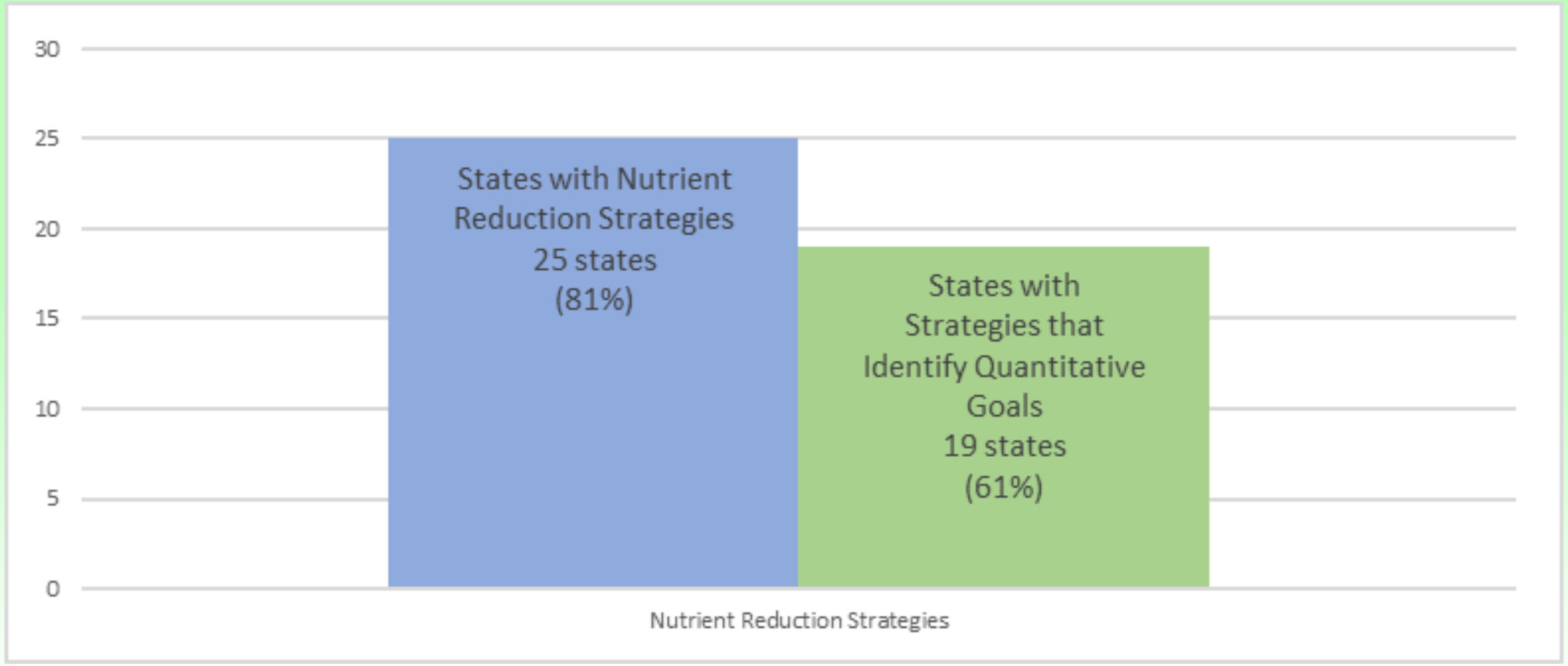


The 2018 Gulf of Mexico hypoxic zone or “dead zone” measured 7,040 square kilometers (2,720 square miles).

What can we do?

States are already doing significant work on nutrients!

https://www.acwa-us.org/focus-areas/nutrients-policy/nutrients-reduction-progress-tracker/



process.

States are already doing significant work on nutrients!

https://www.acwa-us.org/focus-areas/nutrients-policy/nutrients-reduction-progress-tracker/

The ACWA Nutrient Reduction Progress Tracker – Version 1.0, 2017 report is the first in what will be a series of reports on state nutrient reduction progress based on information from the Nutrient Reduction Progress Tracker. The NWG will continue to refine the tracker questions and dig deeper on certain results as the project moves forward. The tracker will build upon itself each year, allowing for better tracking and understanding of state nutrient reduction progress and trends nationwide.

Even though this is the first year of this effort, the results make it clear that states are taking significant, yet varied, actions to reduce nutrient loads in their waters. States are also collaborating with their publicly owned treatment facilities, state drinking water partners, state agriculture departments, federal agencies, conservation offices, NGOs, the private sector, and other entities to reduce nutrient pollution.

Constructed Wetlands

Constructed wetlands are treatment systems that use natural processes involving wetland vegetation, soils, and their associated microbial assemblages to improve water quality.

Constructed wetlands are a relatively inexpensive and low-maintenance option for agricultural applications and are capable of treating a number of wastewater types.

Constructed Wetlands

Constructed wetlands are engineered to optimize naturally occurring biological, chemical, and physical processes to treat wastewater.

Baker Lad's Farm Project

Clayton, Michigan

Baker Lad's Farm utilizes a closed-loop nutrient recycling system to prevent contaminants from escaping to the environment. A 20-acre sub-irrigation system with water table management provides efficient use of two million gallons of 'gray water' from the dairy milking center and runoff from the feed storage and processing area.

The dilute wastewater is cycled through a three-stage wetland for biological treatment and retention before being pumped through the sub-irrigation system to meet the water and partial nutrient needs of 10 acres of corn during the growing season.

https://www.canr.msu.edu/news/managing_the_farming_system_to_feed_our_crops_and_protect_our_water

Franklin Farm Project

Mackinaw River, Illinois – Nature Conservancy

The wetlands being researched at Franklin Farm are designed to take tile water (not surface water) from nearby crop fields and slow down and clean the water.

https://www.youtube.com/watch?v=jyfu6WSqHVI&feature=youtu.be

Water Quality Trading

Water Quality Trading

EPA/USDA Letter: Agency Engagement in Addressing Nutrients Pollution – December 4, 2018

https://www.epa.gov/sites/production/files/2018-12/documents/andersen-kansas-joint-letter.pdf

EPA Memorandum: *Water Quality Trading Policy to Promote Market-Based Mechanisms for Improving Water Quality* – February 6, 2019

https://www.epa.gov/sites/production/files/2019-02/documents/trading-policy-memo-2019.pdf

An important part of improving our nation's water quality is leveraging the collective resources of the federal family and improving relationships with our partners on the ground…Building on efforts already underway at the state, local and tribal level, EPA is taking a number of steps to help facilitate the use of a broad range of tools and technologies that will deliver critical water quality improvements at a lower cost."

-EPA Assistant Administrator for Water David Ross.

*"***USDA has a long history of working with EPA, state governments, tribes and agricultural producers to find voluntary solutions for improving water quality…We are grateful for this partnership, and we look forward to continuing to support cleaner water."**

-USDA Under Secretary for Farm Production and Conservation Bill Northey

Water Quality Trading

EPA's new trading memo identifies the following six *Market Based Principles* designed to encourage creativity and innovation in the development and implementation of programs that reduce pollutants in our Nation's waters:

- States, tribes and stakeholders should consider implementing water quality trading and other market-based programs on a watershed scale.
- EPA encourages the use of adaptive strategies for implementing market-based programs.
- Water quality credits and offsets may be banked for future use.
- EPA encourages simplicity and flexibility in implementing baseline concepts.
- A single project may generate credits for multiple markets.
- Financing opportunities exist to assist with deployment of nonpoint land use practices.

Water Quality Trading

North Carolina

The primary nutrient reduction practice underlying NC's non-point source nutrient offset trading program is agricultural buffer restoration.

However, NC does offer stormwater wetland nutrient credits for developers using NC's SNAP tool to calculate new development load reduction needs.

NC also was an active wetlands mitigation program.

For more information, contact Jim Hawhee, Environmental Program Consultant, North Carolina Dept. of Environmental Quality at jim.hawhee.@ncdenr.gov.

Water Quality Trading

Virginia

Virginia's state code allows for the use of wetlands as a nutrient bank, however, the state has not had such a proposal to date.

Virginia has approved stream restoration projects as nutrient banks. In those cases, the Chesapeake Bay Program's expert panel report on the stream restoration to quantify the reductions.

For more information, contact Allan Brockenbrough, Virginia Dept. of Environmental Quality at allan.brockenbrough@deq.virginia.gov.

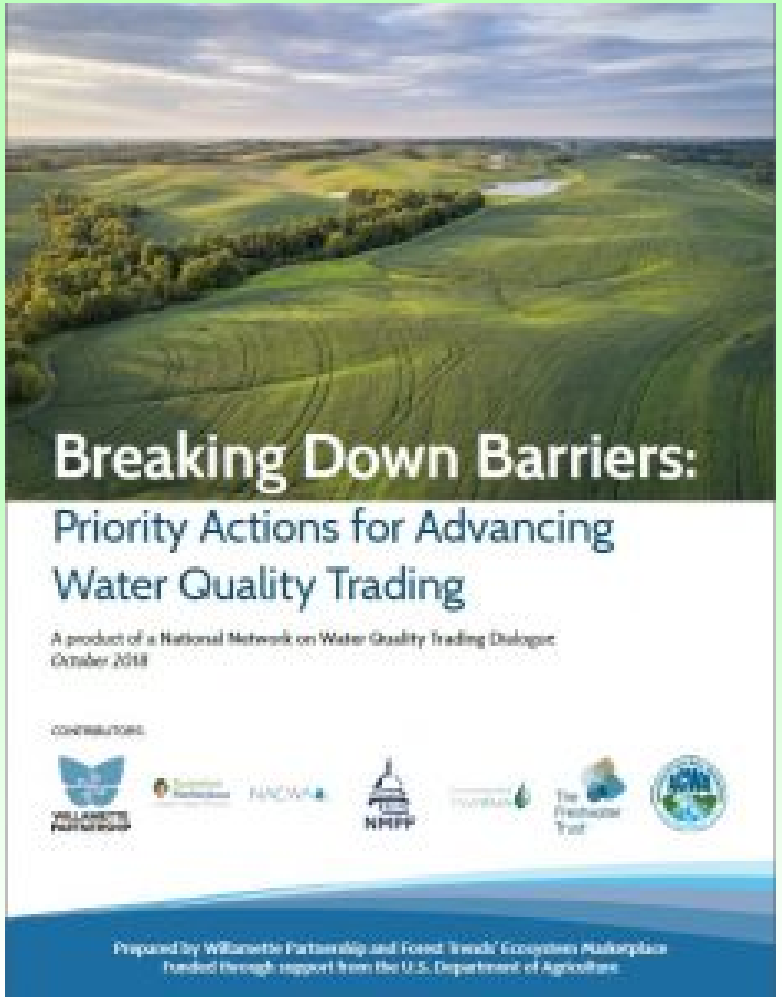
National Network on Water Quality Trading

The National Network on Water Quality Trading is made up of diverse organizations representing agriculture, wastewater utilities, environmental groups, regulatory agencies, and the practitioners delivering water quality trading programs.

National Network on Water Quality Trading

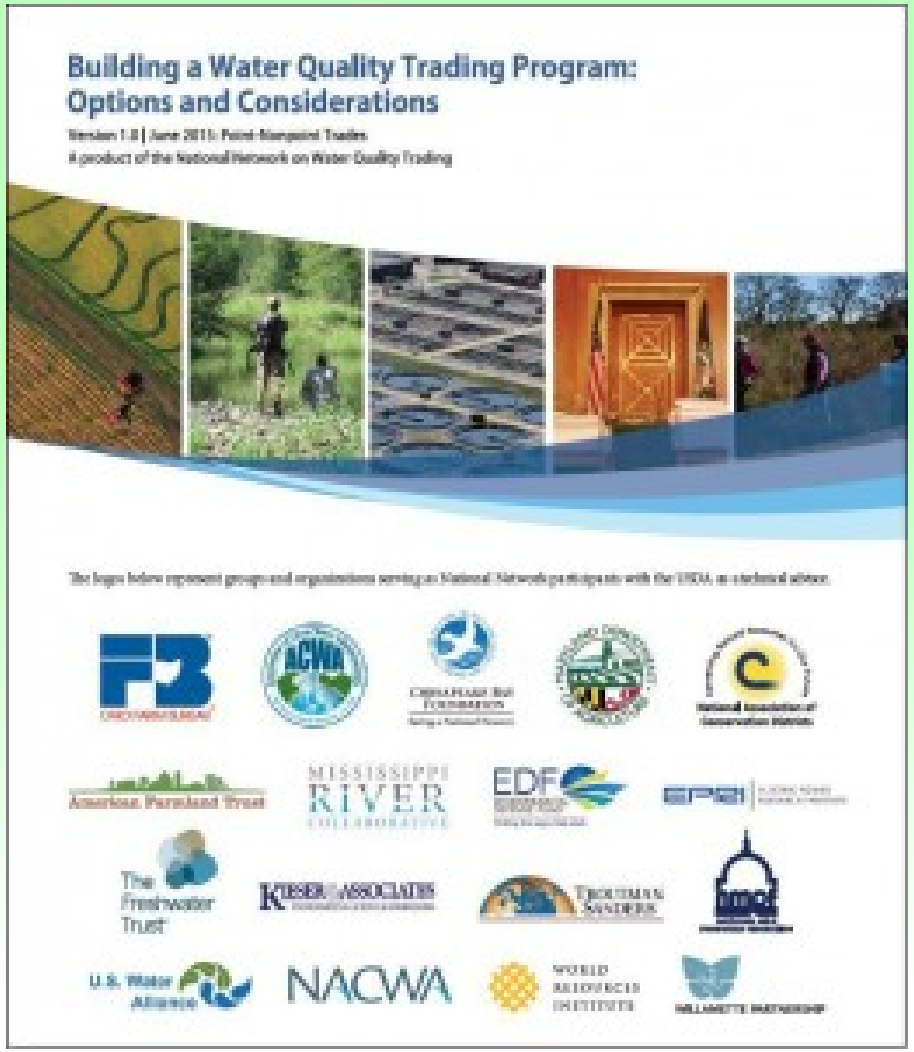
http://nnwqt.org/products/

National Network on Water Quality Trading



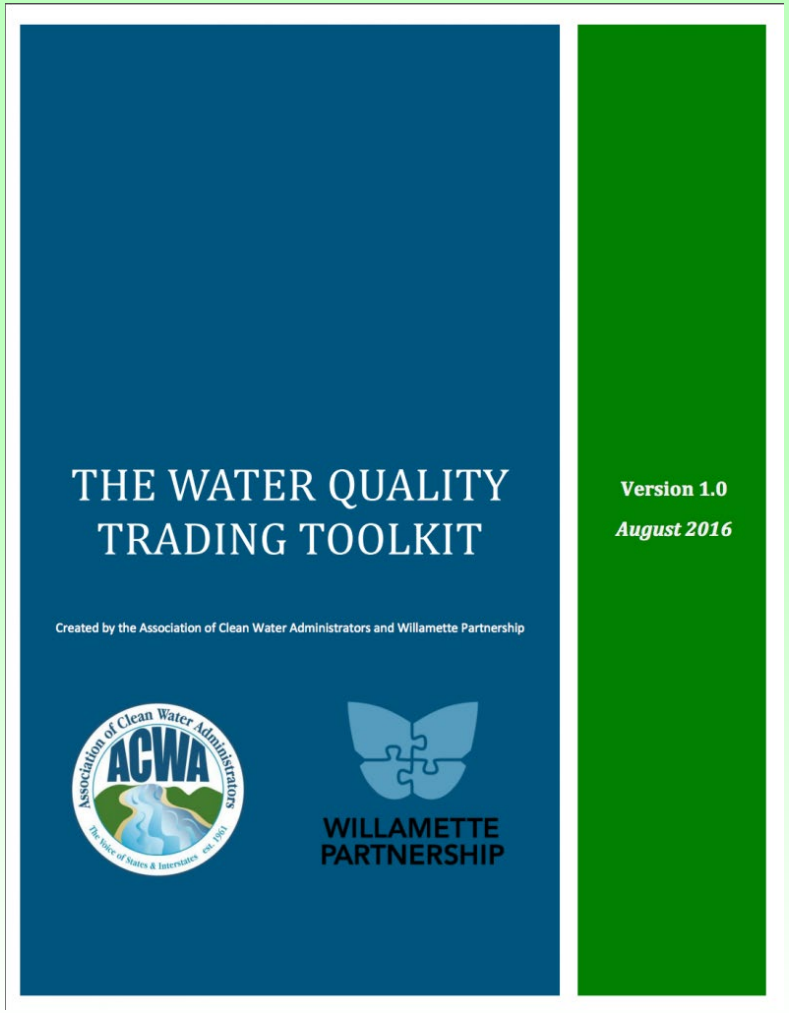
Breaking Down Barriers: Priority Actions for Advancing Water Quality Trading investigates what's keeping water quality trading on the sidelines and proposes a detailed action agenda to help get water quality trading on the ground in more watersheds across the United States.

National Network on Water Quality Trading



Building a Water Quality Trading Program: Options and Considerations walks through 11 key elements many trading programs consider in their design, with examples, options, and clear pros and cons for program design to help stakeholders build a program that meets local needs. For each of these elements, there is no "one size fits all solution." Instead, there are considerations that make different options more or less viable under different conditions.

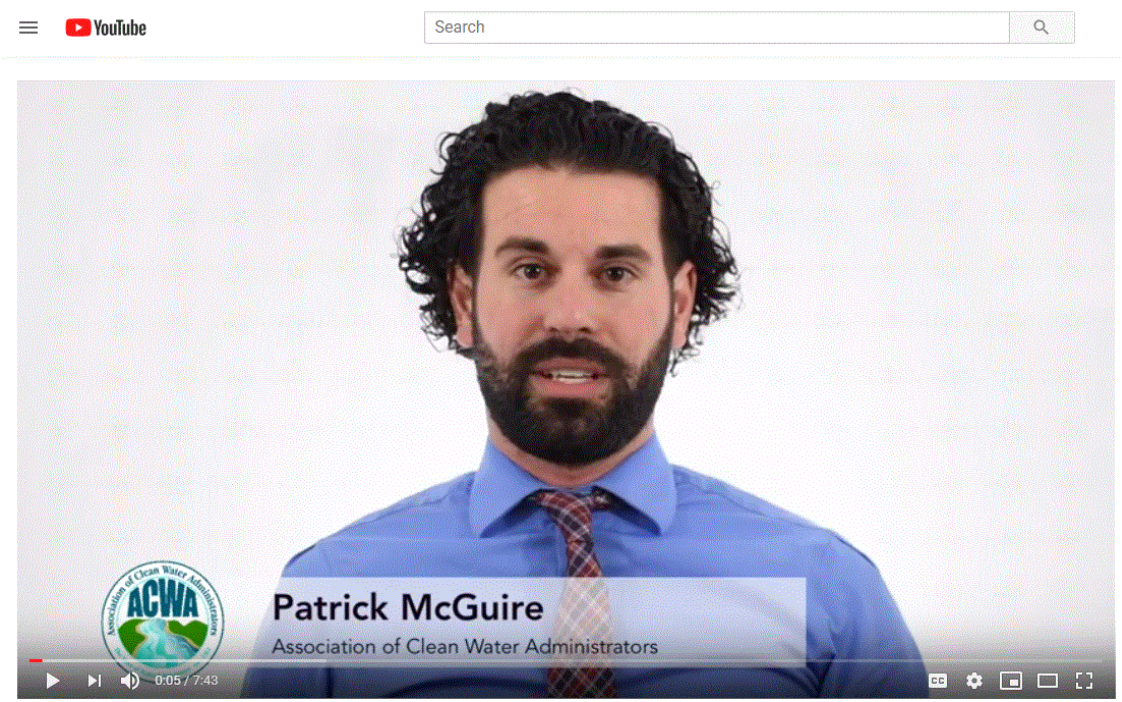
Willamette Partnership and ACWA



Willamette Partnership and the Association of Clean Water Administrators ("ACWA") developed the Water Quality Trading Toolkit ("Toolkit") templates to provide a blueprint for those states/organizations seeking to create a water quality trading program.

The Toolkit consists of five templates meant to work in concert with each other: state guidance, watershed framework, state rule, NPDES permit, and program annual report. The templates are meant as a starting point only. Any language can be adjusted and customized to meet the needs of your particular state/organization. Furthermore, a state/organization may not need to use every template and may choose to use as many or as few of the templates as necessary. Each state/organization should use its discretion to determine which information, and how much detail, is placed in a rule, guidance, watershed trading framework, or NPDES permit.

Willamette Partnership and ACWA



Water Quality Trading Baseline Basics

Water Quality Trading Toolkit Videos

Introduction:
https://www.youtube.com/watch?v=OsEEbUnWr30&t=100s

How to Use the Toolkit:
https://www.youtube.com/watch?v=FC4BrfYfD6g&t=35s

Baseline:
https://www.youtube.com/watch?v=tphqkOzscXs

Questions?

Mark Patrick McGuire, Esq.
Environmental Program Manager
Association of Clean Water Administrators
Email: mpmcguire@acwa-us.org
Phone: 202-756-0604