

Ohio River Basin Water Quality Trading Project

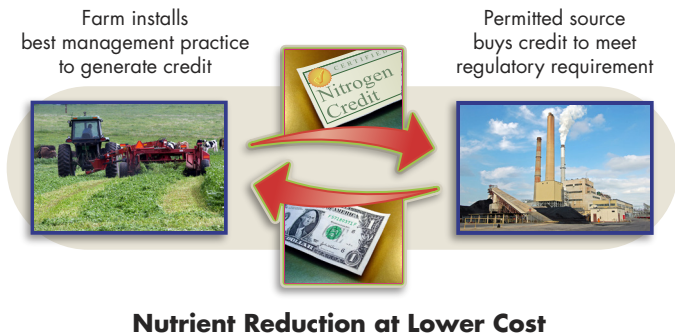


What is Water Quality Trading?

Water quality trading is an innovative market-based approach to achieving water quality goals for nutrients such as phosphorus and nitrogen through programs that allow permitted dischargers to purchase nutrient reductions from another source. Control costs for any one nutrient can differ from one emitter to another, and water quality trading provides an option for meeting discharge requirements in a cost-effective manner.

Pilot Trading Plan 1.0 for the Ohio River Basin Water Quality Trading Project, which describes the rules and approach for the pilot period, at <http://wqt.epri.com>.

No laws or regulations require industries or landowners to participate in water quality trading programs. The Ohio River Basin Trading Project is entirely voluntary. The incentive to participate is based on the likelihood that credit sellers will receive attractive financial benefits by selling credits, and that permitted dischargers will have the flexibility to cost-effectively meet their environmental permit requirements. With participation from Ohio, Indiana, and Kentucky, EPRI transacted the first voluntary, verified, and quantified stewardship credit sales in the project on March 11, 2014. These stewardship credits cannot be applied towards a permit compliance obligation, but can be used to meet corporate sustainability goals. The transactions test critical elements in the project that will inform ongoing adaptive management.



Project Overview

Since 2007, the Electric Power Research Institute and a strong collaboration of stakeholders have been working to develop a regional interstate water quality trading framework in the Ohio River Basin. Properly designed and deployed, the proposed trading program in the Ohio River Basin allows exchanges of water quality credits for nitrogen and phosphorus aimed at protecting and improving watersheds at lower overall costs. In August 2012, Ohio, Indiana and Kentucky signed an interstate pilot trading plan making it now the world's largest water quality trading program. Since the project is building a core set of methods and documents, it could be expanded to other states in the Ohio River Basin in the future. Download the signed

Project Vision

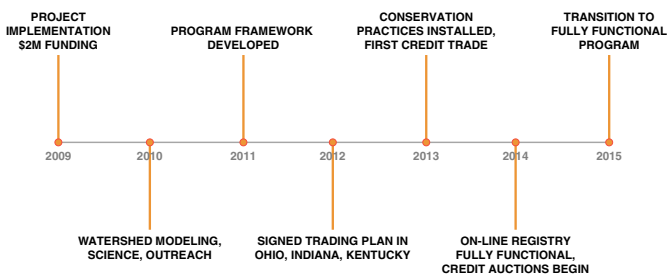
The vision of this project is to improve water quality by establishing water quality trading as an economically, socially, and ecologically viable approach in the Ohio River Basin.

Primary Stakeholder Groups

- Federal and State Agencies
- Electric Power Plants
- Wastewater Treatment Plants
- Agriculture
- Environmental Groups

Stakeholder Advisory Committees

The Project has actively sought input with stakeholders at appropriate intervals since 2009. We have three organized stakeholder advisory committees including Agriculture, Power Plants, and Environmental Groups. We appreciate the National Association of Clean Water Agencies (NACWA) for hosting project calls with their WQT wastewater treatment plant committee, as needed. Further, we have direct engagement with State and Federal Agencies at appropriate levels and frequencies. We are grateful for the energy and candid input from all of our participating stakeholders, without which the project would not be possible. More information about many of these stakeholder groups can be found on the public website: <http://wqt.epri.com>.



Project Timeline

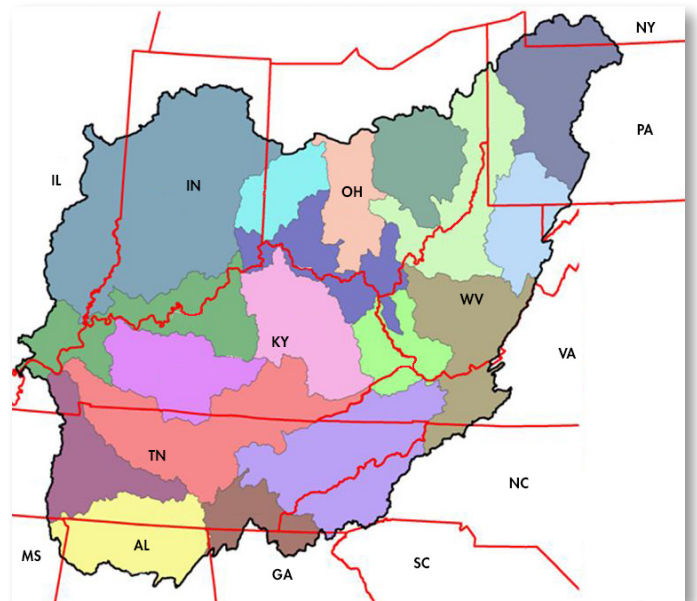
Funders and Collaborators

In order to address the need for coordination and collaboration across a diverse set of stakeholders, the Electric Power Research Institute (EPRI) has assembled a group of strategic collaborators. These collaborators meet regularly by phone and in person to discuss the design and implementation of the Ohio River Basin Trading Project.

- American Electric Power
- American Farmland Trust
- Duke Energy
- Electric Power Research Institute
- Exelon Corporation
- Hoosier Energy
- Markit Environmental Registry
- Ohio Farm Bureau Federation
- Ohio River Valley Water Sanitation Commission (ORSANCO)
- Tennessee Valley Authority
- Troutman Sanders, LLP
- The Mosaic Company Foundation
(via American Farmland Trust)
- U.S. Department of Agriculture
- U.S. Environmental Protection Agency
- University of California at Santa Barbara

Watershed Modeling: Scientific Foundations

A fundamental challenge for water quality trading is understanding, quantifying, and managing the uncertainty associated with the implementation of practices on-the-ground and their associated water quality benefits over time and place. This challenge is especially pronounced when trading involves agricultural nonpoint sources as credit sellers. The project is using a scientifically-based credit equation methodology that will account for location-specific nutrient attenuation factors, rather than a blanket trading ratio throughout the entire Ohio River Basin. The use of models ensures that the credits in the Project appropriately account for both farm and watershed unique characteristics on a transaction by transaction basis.



Ohio River Basin Watersheds

The Project uses two models used for estimating nutrient reduction from the point of generation (credit seller) to the point of use (credit buyer). We are currently using EPA Region 5's spreadsheet model for estimating nutrient reductions at the edge-of-field as different Best Management Practices (BMPs) are implemented. However, we continue to monitor opportunities to improve the edge-of-field estimates, including the USDA/NRCS Nutrient Tracking Tool (NTT) and others. The Watershed Analysis Risk Management Framework (WARMF) model is used for estimating nutrient attenuation (reduction) from the edge-of-field to the point of use.

Under funding from USDA and EPA, the Project collaborated with the University of California Santa Barbara to calibrate the WARMF model with observational data. The nutrient load attenuation factors were developed for total nitrogen (TN) and total phosphorus (TP) for the watersheds in the Project

pilot area. Modeling this attenuation creates a trade ratio of the amount of nutrients at the point of creation to the amount of nutrient reduction at the buyer location specific to each credit. More results of the model calibration can be found in the EPRI report (1025820) “Implementation of the Watershed Analysis Risk Management Framework (WARMF) Watershed Model for Nutrient Trading in the Ohio River Basin” which can be found at <http://wqt.epri.com/reference-shelf.html>.



The screenshot shows the Ohio River Basin Water Quality Trading Project website. It features a search bar and a table with columns for Account Holders, Projects, Issuances/ Listings, Holdings, and Retired Credits. The table lists two projects: 'April OIB Project 1' and 'April OIB Project 2', each with details on project type, start date, start date of commencement, state, province, watershed (PNC #), sub-watershed (PNC #), and BMP. The first project is for Phosphorus Reduction in the Muskingum watershed, and the second is for Nitrogen Reduction in the Scioto watershed.

Account Holders	Projects	Issuances/ Listings	Holdings	Retired Credits					
	Project Name	Project Type	Project Start Date	Start Date of Commencement	State / Province	Watershed (PNC #)	Sub-Watershed (PNC #)	BMP	Details
	April OIB Project 1	Phosphorus Reduction	02 Apr 2013	24 Apr 2013	Ind	Muskingum	Headwaters Black Fork Moccasin River	Cover Crop	View
	April OIB Project 2	Nitrogen Reduction	03 Apr 2013	30 Apr 2013	34324	Scioto	Camp Creek-Scioto River	Heavy Use Area	View

Trading Registry Under Development

Water Quality Trading Infrastructure

In August of 2012, USDA Under Secretary for Natural Resources and Environment Harris Sherman announced that EPRI received a Conservation Innovation Grant (CIG) of \$1 million to deploy an innovative, secure and proven online registry to support the pilot program in the Ohio River Basin Water Quality Trading Project. This will be the third CIG project grant since 2009. The 2012 grant funding added a key component that is critical to the long-term success of water quality trading in the region: transparent, efficient and robust market infrastructure. This infrastructure, provided by Markit, will include a sophisticated credit registry (see screenshot above), documentation flow tools, and a secure transaction platform. The registry system tracks credits through the credit lifecycle and provides appropriate public access to the documentation for each credit listing. Markit has been named Best Registry Provider for four consecutive years in the annual survey conducted by Environmental Finance magazine and we are proud to be working with them on this effort. The full press release can be found at [Reference Shelf of the project website](#).

Credit Stacking

Many conservation practices provide multiple benefits to the environment. Credit stacking is defined as establishing more than one credit on spatially overlapping areas. Credit types include carbon, endangered species, water quality, and wetlands. The motivation for credit stacking research is to vet opportunities for multiple credit types in the Ohio River Basin, initially focusing on water quality and carbon with possible expansion to other ecosystem markets. In 2011, EPRI published an analysis of the current state and viable opportunities for credit stacking in the United States (Fox, Gardner and Maki 2011). During the pilot

period, this Project will calculate greenhouse gas reductions (credits) via reduced fertilizer application of the pilot trades. EPRI intends to use a Nitrous Oxide calculator developed by EPRI and Michigan State University (MSU-EPRI Methodology), along with other methods. The MSU-EPRI calculator completed verification with the American Carbon Registry in July of 2012, and the Voluntary Carbon Standard in March of 2013. More information about EPRI’s credit stacking research can be found at <http://wqt.epri.com/credit-stacking.html>.



Signing of the Pilot Trading Plan V 1.0. From right to left, Steve Hohmann, Commissioner, Kentucky Department of Natural Resources; Bruce Scott, Commissioner, Kentucky Department of Natural Resources; Thomas Easterly, Commissioner, Indiana Department of Environmental Management; Joseph Kelsay, Director, Indiana State Department of Agriculture; Scott Nally, Director, Ohio Environmental Protection Agency; Karl Gebhardt, Chief and Deputy Director, Division of Soil & Water Resources, Ohio Department of Natural Resources.

Getting Involved

Advisory Committees

Decisions regarding program design, timing, and rules are made with input from advisory committees organized for the power industry, wastewater treatment plants, agriculture, federal and state agencies, and environmental groups. Additionally, we host outreach meetings throughout the Ohio River Basin. If you would like to participate in one of these advisory committees, participate in an in-person meeting, or share any ideas or concerns, please e-mail us at ohiorivertrading@epri.com.

Project Updates

EPRI publishes a regular update newsletter, and hosts public webcasts on the progress of project activities. To receive notifications of these updates, please email your request to ohiorivertrading@epri.com.

Project Website

EPRI intends to foster a collaborative process for the development and implementation of this project. The project website was designed to facilitate communication of important project materials, and to solicit questions, comments, and feedback from any interested stakeholder. Please visit the project website for more information, and additional project resources: <http://wqt.epri.com>.

Project Funding

The project has been funded with a \$1 million grant from the EPA, and \$2.3 million in multiple grants from the USDA Natural Resources Conservation Service. In addition, the project has raised approximately \$4 million in matching funding from project collaborators. EPRI is continuing to consider additional funding opportunities in the form of state and federal grants, along with foundation funding.

Anyone who is interested in funding the project should contact the project team at ohiorivertrading@epri.com.

The Electric Power Research Institute, Inc. (EPRI, www.epri.com) conducts research and development relating to the generation, delivery and use of electricity for the benefit of the public. An independent, nonprofit organization, EPRI brings together its scientists and engineers as well as experts from academia and industry to help address challenges in electricity, including reliability, efficiency, affordability, health, safety and the environment. EPRI also provides technology, policy and economic analyses to drive long-range research and development planning, and supports research in emerging technologies. EPRI's members represent approximately 90 percent of the electricity generated and delivered in the United States, and international participation extends to more than 30 countries. EPRI's principal offices and laboratories are located in Palo Alto, Calif.; Charlotte, N.C.; Knoxville, Tenn.; and Lenox, Mass.

For more information, contact the EPRI Customer Assistance Center at 800.313.3774 (askepri@epri.com).

Access to public reports, project updates, upcoming events, and funding announcements, can be found at <http://wqt.epri.com>.

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