ELECTRIC POWER RESEARCH INSTITUTE

Ohio River Basin Trading Project

October 2017 **Project Update**

Manager Message

Two years ago, EPRI received a generous infusion of grant funding (see press release) to integrate forestry projects as a best management practice for reducing nutrient runoff on farmland. We also received additional funding for the development of "credit stacking" of nutrient and greenhouse gas emission reductions. This project newsletter reports on progress from the investments from the U.S. Endowment for Forestry and Communities and U.S. Department of Agriculture Natural Resource Conservation Service.

During the past year we have continued rigorous project documentation, maintained the online credit registry hosted by Markit, investigated adding quantified carbon credits to the project, and most notably released the 2016-2018 Funding Opportunity Notice to Landowners to incentivize forestry as a conservation practice. We are looking forward to amending the Trading Plan, which will ensure we continue to use the best available science and most efficient means to implement this project.

We are also working to sell credits! Revenue from credit sales will ultimately determine the economic viability of this project. All revenue is reinvested into more farms and project implementation; the project team is incentivized by this direct on-the-ground benefit. The realization of many credit transactions will be critical to the continued success of this project and will determine if it moves beyond pilot phase.

EPRI is not an advocate for water quality trading per say, but as a research organization we are committed to testing under what conditions it can be socially, environmentally, and economically sustainable. We continue to be steadfast in our transparency, integrity, and defensibility in all aspects of project execution.

Sincerely,

Jessica Fox
EPRI Senior Program Manager

CREDITS FOR SALE!

Your search for high quality, defensible, and verified water quality credits is over! There is no reason to wonder if your conservation dollars are resulting in the environmental and social benefits that you hope for. Backed by science, metrics, and state approvals, "stewardship credits" can be used to meet your sustainability goals, offsetting supply chain impacts, or even Supplemental Environmental Project (SEP) obligations.

A stewardship credit is a quantified reduction of a pollutant. Each credit equals one pound of nutrient (nitrogen or phosphorous) reduction, plus associated ancillary ecosystem benefits including pollinator habitat, greenhouse gas avoidance, carbon sequestration, soil health, rare species, and habitat enhancement. A thorough and transparent process ensures that credits represent real environmental improvements which have been verified by State agricultural and permitting agencies. All monitoring and verification documents, including farm photos, are posted on the project's online credit registry hosted by Markit.

BENEFITS TO CREDIT BUYERS

- Sustainability:
  - Offset supply chain impacts from corn, soy, wheat, milk, beef, wood product, and more
  - Achieve personal and corporate sustainability goals and commitments
  - Tell compelling stories about your efforts to protect water, soil, farms, pollinators, and climate
- Compliance:
  - Meet Supplemental Environmental Project obligations related to water
  - Consideration for flexible water discharge permit compliance schedules
  - Develop comfort in the program for future compliance needs
- Social:
  - Gain experience in the only interstate water credit trading program
  - Give back to the communities where your food comes from
  - Support local farmers and their communities

"Through solid science, transparency, ad exceptional management, the EPRI project is a national model for how to advance non-traditional collaborations that benefit our common good. Now companies have the opportunity to be part of this effort, receive turn-key verified credits to meet their stewardship goals, and support local communities. Efforts like this will be critical for protecting America's waters for years to come."

Mr. Bob Perciasepe, President, Center for Climate and Energy Solutions. Former Deputy Administrator, EPA

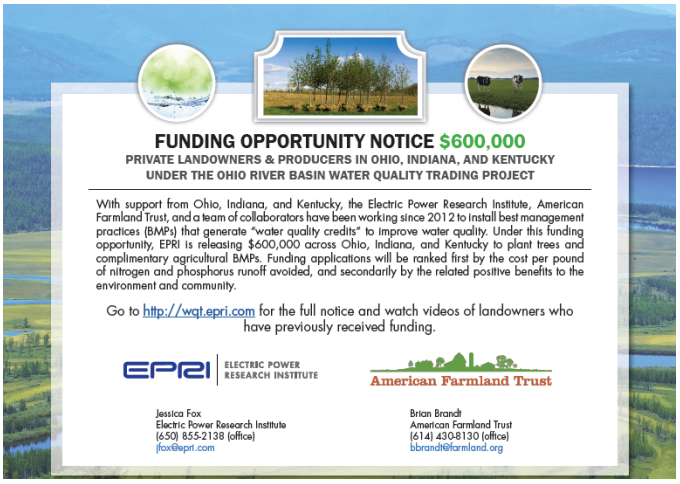
Currently the project has approximately 100,000 pounds of nitrogen and phosphorus available for purchase for $10 per pound for each annual credit. All revenue from credit sales are reinvested into the program to support continued project execution and farmer funding. Anyone can express interest in purchasing credits to ohiorivertrading@epri.com.

Funding Available for Forestry and Farm Practices

A grant from the U.S. Endowment for Forestry and Communities will add reforestation as an option along with other ongoing land management practices such as cover crops, filter strips, and livestock exclusion to generate nutrient credits for improving local and regional water quality, as well as providing social and economic benefits to the region.

"Forestry is another option for reducing nutrient flow into waterways that creates wildlife habitat and provides farmers and private landowners with the potential for additional income from, for example, timber products," said Carlton Owen, the Endowment's president and CEO.

The 2016-2018 Funding Opportunity Notice that moves private funding to local landowners has been a significant focus of the project team over the last 18 months. This included adding forestry-specific experts to the project's agricultural advisory committee and assessing additional scientific models that can appropriately estimate water quality benefits of planted forest.


FUNDING OPPORTUNITY NOTICE $600,000
PRIVATE LANDOWNERS & PRODUCERS IN OHIO, INDIANA, AND KENTUCKY
UNDER THE OHIO RIVER BASIN WATER QUALITY TRADING PROJECT

With support from Ohio, Indiana, and Kentucky, the Electric Power Research Institute, American Farmland Trust, and a team of collaborators have been working since 2012 to install best management practices (BMPs) that generate "water quality credits" to improve water quality. Under this funding opportunity, EPRI is releasing $600,000 across Ohio, Indiana, and Kentucky to plant trees and complimentary agricultural BMPs. Funding applications will be ranked first by the cost per pound of nitrogen and phosphorus runoff avoided, and secondarily by the related positive benefits to the environment and community.

Go to http://wqt.epri.com for the full notice and watch videos of landowners who have previously received funding.

EPRI ELECTRIC POWER RESEARCH INSTITUTE

American Farmland Trust

Jessica Fox
Electric Power Research Institute
(650) 855-2138 (office)
jfox@epri.com

Brian Brandt
American Farmland Trust
(614) 430-8130 (office)
bbrandt@farmland.org

After careful work structuring the funding opportunity, coordinating with the states, and making modifications based on feedback from the agricultural advisory committee, the funding was released on August 6, 2016 for $600,000 to the three states.

We developed an approach to increase efficiency of this funding notice compared to the prior funding opportunity between 2012 and 2015. This round we utilize a "Rapid Pre-Screen" step to allow landowners to send in ideas that the project team reviews to determine if there are any "no-go" factors before proceeding with the more time-consuming full project application.

Due to a limited response and based on feedback from SWCDs, the funding opportunity notice was updated on January 10, 2017 to extend the installation deadline from November 2017 to July 2018; add significant portions of Kentucky to the eligible funding area; add PDF fillable Rapid Project Pre-screen forms and fillable Full Application templates.

Marketing of the funding opportunity has included the following:

- The States (OH, IN, and KY) have all distributed the funding notice to every eligible SWCD in their states via email. Notification post cards were developed and distributed at various conferences.
- Direct outreach by the project team to eligible SWCDs has occurred.
- In April 2017, EPRI hosted 2 state-specific webcasts for all eligible counties in Ohio and Kentucky to present the funding opportunity and answer questions. Webcast invitations were sent to every eligible SWCD by the state agriculture agency, including a reminder the day prior to the webcast.
- An article has run in Farm World magazine every other week for 2 months (mid-June 2017 through mid-August 2017).

We continue to actively seek project proposals from eligible private landowners. Project applications are being reviewed on a rolling basis until all funds are expended through June 15th, 2018. Projects must be fully

installed only on private land (not federal or state property) and no later than July 15, 2018. Funding covers up to 80% of total project costs. (i.e. 80% cost share cap). At least 60% of requested funds must be applied towards tree planting, with no more than 40% applied towards complimentary BMPs. We have approved funding for forest plantings primarily in Ohio and continue to accept project applications in all three states.

Trading Plan Amendment

On October 26, 2017, the permitting and agriculture agencies in Ohio, Indiana, and Kentucky will sign an amendment to the Trading Plan that defines the rules of the program. The driver for the amendment is to remain consistent with the project's obligation to adaptive management to ensure the best science and the most efficient implementation approaches are used.

Representatives from Ohio, Indiana, and Kentucky signing the original Trading Plan, August 2012

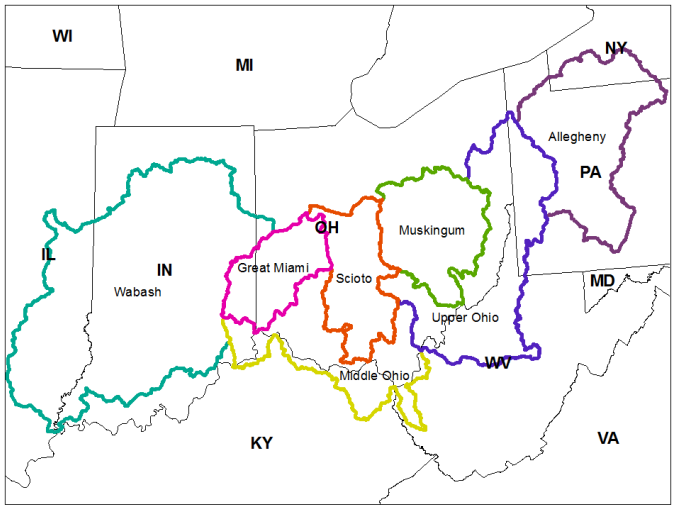
The trading plan was originally signed in August 2012 (see photo) and first amended in October 2013. In addition to updates that allow the project to utilize the best science and most efficient approaches, this second amendment symbolizes a continuing commitment to work together to support farmers, protect critical water resources, and reduce greenhouse gas emissions. During an on-farm signing event, we will mark the next phase of the project and accelerate the innovative injection of private money into local economies and watersheds. The amendment includes:

1. Recognizing that credit calculation methodologies continue to emerge and evolve, the project is encouraged to use the best available science for selecting models for estimating edge-of-field nutrient reductions to appropriately quantify. [Currently the project utilizes EPA Region 5 spreadsheet for edge-of-field estimates. This amendment will allow for direct measure and more recently calibrated models, per the approval of the State].
2. Recognizing the need to efficiently verify an increasing number of installed BMPs, as well as opportunities to alleviate the burden on State agency staff, the Project is authorized and encouraged to adapt and revise its annual verification practices to ensure efficiency, effectiveness, and credibility. This could include the use of next generation technologies, including aerial photos, aerial drones, direct field monitors, and remote sensors. [Currently state agricultural agency staff do on-field inspections. This amendment will also allow the optimization of the inspections given weather, season, and practice type.]
3. The Project is authorized and encouraged to adapt and revise its contracting practices and procedures in order to make the credit generation process more efficient for all participants, including contracting directly with landowners when advisable. [Currently EPRI contracts with landowners via the state agency, then the SWCD, then to the landowner. Amendment will allow for contracts directly with SWCDs and landowners when it can increase efficiency].
4. Extend the pilot period through 2020.

Modeling for Forestry and Nutrients

The project has continued to apply the best science available to determine the nitrogen and phosphorous benefits from the best management practices funded under the program. The Watershed Analysis Risk Management Framework (WARMF) model (Chen et al., 1996; Chen et al., 1998; Chen et al., 2000) has been implemented in over 60 watersheds throughout the U.S. and abroad, for decision-support in watershed management and for regulatory activities, specifically in the development of Total Maximum Daily Loads (TMDLs). As described extensively on the project website and EPRI reports, the WARMF model is being used to estimate the specific nutrient load reductions at particular points in the watershed. Under the leadership of Dr. Arturo Keller at University of California Santa Barbara, we have created arguably the most dynamic and defensible water quality credit calculation approach for quantifying nutrient loads at specific locations. The scientific investment needed to enable this has been extensive.

During the last year, we have added another full watershed, the Wabash, to the areas where we can run this sophisticated modeling. EPRI research determined the magnitude of the attenuation factors that drive the tradability of nutrient load reductions in these watersheds, as well as the magnitude of the current nutrient loads for point and non-point sources, and thus the size of the trading market in each of the watersheds. The Wabash River is over 800 km (~500 miles) long, starting near the northwest border of Ohio and discharging in the southern Illinois near the Illinois Indiana border before draining into the Ohio River. As detailed in the EPRI Technical Report (3002011868), the Wabash Watershed had 1,009 NPDES permits recorded with the USEPA between 2005 and 2015. They include firms in the manufacturing sector, waste water treatment facilities, metal working operations, and power plants. Based on specific agricultural land use analysis by county, there are likely many opportunities to apply agricultural best management practices that can create water quality credits for phosphorous and nitrogen in the Wabash watershed. The in-stream attenuation factors are small (5-35%) for shorter distances (e.g., 1-2 catchments below the location where the load is reduced), but increases significantly for longer distances (6-8 catchments below), up to 70-85%.



The Wabash watershed considered in this new report, Upper Ohio, Middle Ohio, Allegheny, Muskingum, and Scioto watersheds modeled in previous reports.

The project has also considered the best model to use specifically for the forestry practices. After consideration of various models, we are testing the use of ALMANAC for estimating nutrient benefits associated with the growth of forests. The "Rapid Pre-Screen" developed for the 2016-2018 Funding Opportunity Notice (discussed above) includes the determination of the proposed project being low, medium, or high priority for funding based on inserting the basic project specifications into ALMANAC. The active utilization of the pre-screen step has been very useful for revealing differences in modeling results between ALAMANC, NRCS Nutrient Trading Tool, and EPA's Region 5 spreadsheet. The project team will be writing up details of these observations in 2018.

Carbon Credits

Under a 2015 USDA-NRCS Conservation Innovation Grant, we are vetting opportunities for creating both greenhouse gas and nutrient credits using the same agricultural practice, with consideration for concerns about double counting. For example, it may be possible to account for nitrous oxide (N_2O) and nitrogen reductions from reduced fertilizer use and qualify them as greenhouse gas and nutrient reduction credits.

Adding the Delta Institute to the project team, we have completed vetting discussions with American Carbon Registry (ACR) and Verified Carbon Standard (VCS) regarding opportunities, applicable protocols, and estimated costs. The specific afforestation protocols that are allowed by VCS and ACR have been studied and calculation options identified. One primary carbon protocol we were hoping to utilize (MSU-EPRI Nitrous Oxide Protocol) to get carbon credits for the avoided fertilizer application cannot apply to this effort due to concerns over "leakage".

An illustrative example for leakage is a low-yielding corn-soy rotation that we are funding to plant a native hardwood forest. While the landowner will not apply fertilizer to the forest and is taking acres of corn-soy out of production, we cannot take credit for the avoided fertilizer use because, in theory, a new corn-soy rotation will be established somewhere else on the landscape to make up for the reduced corn available to the marketplace. In order to utilize the MSU-EPRI Nitrous Oxide protocol, the same land use would have to be maintained (corn-soy) rather than conversion to another land use (forest).

Generating carbon credits from the forest alone is challenging for small projects (less than 100 acres) both in terms of actual GHG credits as well as the costs for verifying and auditing field-by-field projects. Landowner requests for large forestry projects have been very limited under the current Funding Notice. When we have reviewed larger projects, baseline conditions such as existing hay fields limit the potential of additional water quality and carbon credits, based on the credit calculation models and protocols available to estimate the **additional** carbon and nutrient benefits.

Credit buyers may meet their needs for carbon simply by quantifying the carbon benefits and disclosing the estimation methodology, but staying short of the expense of officially registering the credits on a carbon registry. This will indeed save money, but the ecological defensibility of such an approach would need to be solid. The project team will continue to work on these complex issues.

Public Radio Story

The project was covered by public radio in a comprehensive investigative story developed by Julie Grant of Allegheny Front. The story originally published November 4th, 2016 and republished July 21st, 2017 was part of a series titled, "Headwaters" which focused on the Ohio River. The 8 minute radio spot aired on Public Radio from November 2016 to February 2017 from Pennsylvania to Portland.

Why Big Industry is Paying Small Farmers to Cut Pollution in the Ohio River

By JULIE GRANT • NOV 4, 2016

Tweet
Share
Google+
Email

ALLEGHENY FRONT

Excerpts:

"Though agricultural runoff is largely unregulated, Ken Merrick decided he wanted to do something to stop it on his farm. His plan was to create a large concrete slab for the cows and manure at the top of the hill, secure the hillside and fence the cattle away from the stream. But the $20,000 price tag was pretty steep.

"That's an enormous cost," he says. "Most people would do [it] if they have the opportunity, but they don't have the money to do it. So it never gets done."

But Merrick was able to get it done with help from [the EPRI Ohio River Basin] water credit trading program. That's where industrial polluters—like power plants—buy credits as a way of meeting their pollution limits. And the money goes to farmers to pay for projects like the one on Merrick's farm.

"We started looking into it to try to test out if water quality trading could be an effective mechanism to protect America's waters—and to meet company bottom lines," says Jessica Fox, an environmental scientist with the Electric Power Research Institute (EPRI), which runs the credit program.

She acknowledges that they can't exactly measure pollution reduction on a farm the way they can at the end of a pipe. But she says that doesn't mean there aren't as many benefits. So far, the program has helped fund projects on more than 30 farms and prevented more than 100,000 pounds of nitrogen and phosphorous from getting into the Ohio River.

Beef farmer Ken Merrick has also witnessed the benefits of the controls he's put in using the credit trading program. Now, the mud from his farm no longer washes into the water, and his stream has come back to life.

"My wife was actually out here last summer catching fish with the kids," he says. "My grandpa used to do that. I never caught anything. It's kind of cool to see the fish coming back into the area."

Listen to the full radio story at: https://www.alleghenyfront.org/why-big-industry-is-paying-small-farmers-to-cut-pollution-in-the-ohio-river/

Ken Merrick and his wife, Natsuko, on their farm in eastern Ohio. Photo: Julie Grant

Credit Registry

The credit registry hosted by Markit is updated and continues to be a critical tool for registering approved credits and posting documents and photos in the public domain. Visit the registry to see all our installed projects.

Watch Farmer Videos!

See unscripted stories on our website from some of the farmers and ranchers funded under this program.

"Last year I was hunting rabbit, down over the hill with my cousin. When we got all done my cousin said, "You know, I never seen them dogs stop one time to drink outta the stream." It kinda made me think, well, I know what's going into that stream. We knew we needed to do something, but funding was a problem. It was real easy working with EPRI and AFT [American Farmland Trust]".

Lowmiller Farms (dad and two sons) used funding from the trading project to make improvements to their milk house and feedlot that help protect a nearby stream.

UNITED STATES WATER PRIZE

Project Overview

Water quality trading is a market-based approach to achieving water qual¬ity standards through programs that allow dischargers to purchase pollution reductions from another source. EPRI's Ohio River Basin Trading Project is a first-of-its-kind interstate trading program with initial participation from Ohio, Indiana, and Kentucky. The successful implementation of this Project will allow power companies, farmers, and other industrial dischargers to work together to improve water quality, minimizing costs to the public and stakeholders. The Project will also benefit receiving water bodies that are now threatened by nitrogen and phosphorus pollution.

Project Contact

Jessica Fox, Senior Program Manager
Phone: 650-855-2138
Email: JFox@epri.com
Project e-mail: ohiorivertrading@epri.com
http://wqt.epri.com

EPRI intends to support a collaborative process for the development of this project. The project website was designed to facilitate communication of important project materials, and to solicit questions, comments, and feedback from the many interested stakeholders. Please visit the project website for more information and to download meeting materials, related EPRI reports, Frequently Asked Questions, and additional project resources.

3002011889 October 2017

Electric Power Research Institute
3420 Hillview Avenue, Palo Alto, California 94304-1338 • PO Box 10412, Palo Alto, California 94303-0813 USA
800.313.3774 • 650.855.2121 • askepri@epri.com • www.epri.com