



ELECTRIC POWER
RESEARCH INSTITUTE

Bringing Water Quality Credits to Environmental Stewardship Markets

Ohio River Basin Water Quality Trading Project

Presenters:

Jessica Fox, EPRI

July 17, 2019



www.epri.com

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Overview

Farm installs
best management practice
to generate credit

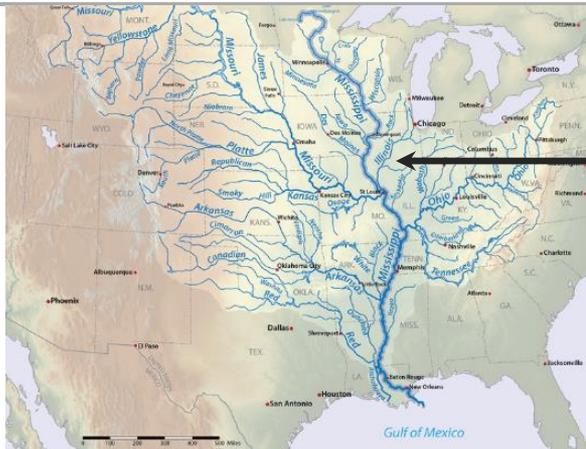


Credits used to meet
sustainability or
compliance goals



Protecting Water and Ecosystems

EPRI | ELECTRIC POWER
RESEARCH INSTITUTE



Collaborators, Funders & Advisory Groups

Organizations:

- Electric Power Research Institute
- American Farmland Trust
- Ohio Farm Bureau Federation
- ORSANCO
- Tennessee Valley Authority
- University of California, Santa Barbara
- American Electric Power
- Hoosier Energy
- Duke Energy
- Troutman & Sanders
- Markit IHS

States & Agencies:

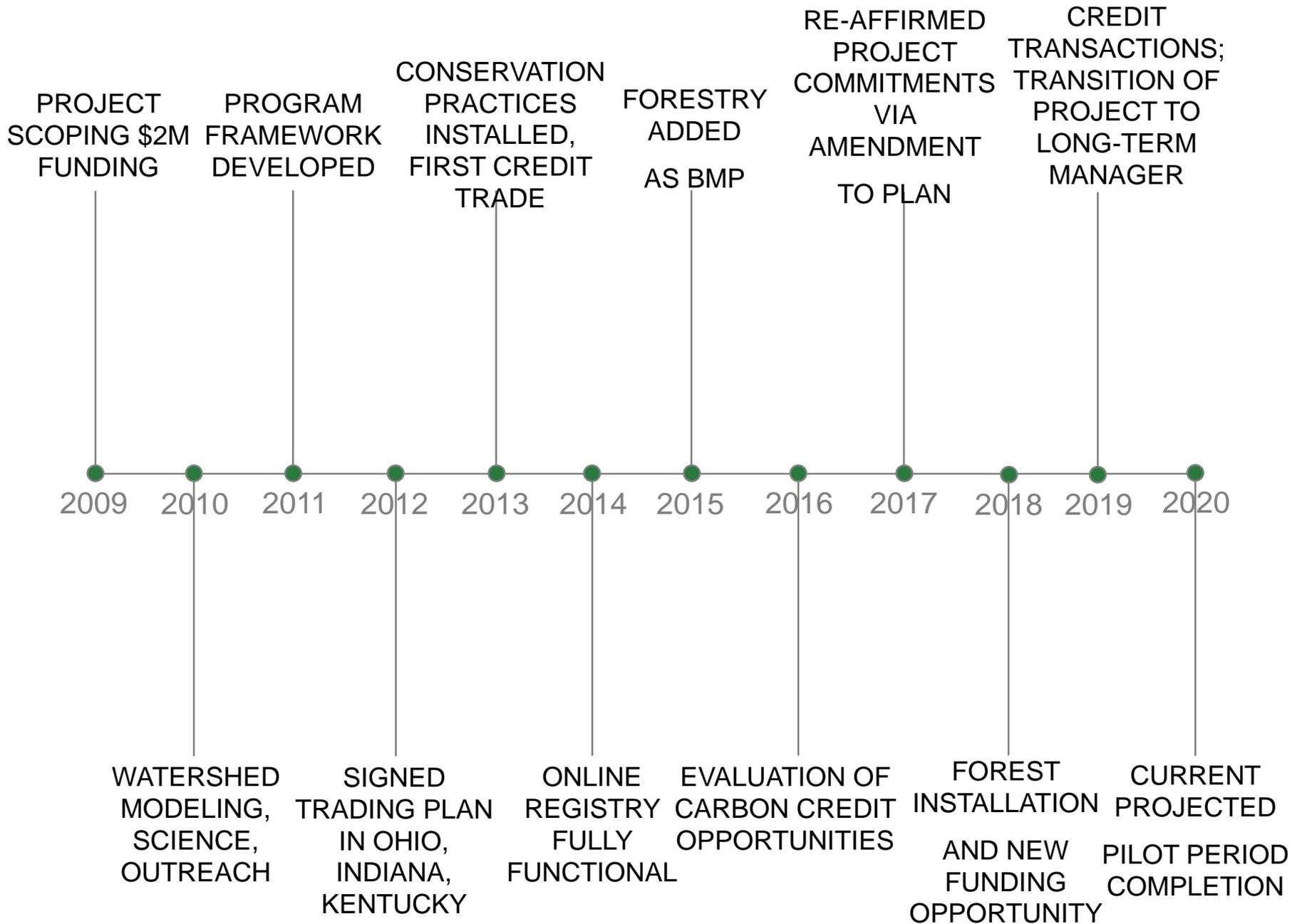
- Ohio, Indiana, Kentucky
 - USEPA, USDA

External Advisory Groups:

- Environmental Groups
- Electric Power Industry
- Wastewater Treatment Plants
 - Agriculture

Large Grants from:

- USDA/NRCS
- US EPA
- US Endowment for Forestry



Keller AA & Fox J (2019)
Giving credit to reforestation for water quality benefits.

PLoS ONE 14(6):
e0217756.

<https://doi.org/10.1371/journal.pone.0217756>

RESEARCH ARTICLE

Giving credit to reforestation for water quality benefits

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Abstract

While there is a general belief that reforesting marginal, often unprofitable, croplands can result in water quality benefits, to date there have been very few studies that have attempted to quantify the magnitude of the reductions in nutrient (N and P) and sediment export. In order to determine the magnitude of a credit for water quality trading, there is a need to develop quantitative approaches to estimate the benefits from forest planting in terms of load reductions. Here we first evaluate the availability of marginal croplands (i.e. those with low infiltration capacity and high slopes) within a large section of the Ohio River Basin (ORB) to assess the magnitude of the land that could be reforested. Next, we employ the Nutrient Tracking Tool (NTT) to study the reduction in N, P and sediment losses from con-

OPEN ACCESS

Citation: Keller AA, Fox J (2019) Giving credit to reforestation for water quality benefits. PLoS ONE 14(6): e0217756. <https://doi.org/10.1371/journal.pone.0217756>

Editor: Rodolfo Nóbrega, Imperial College London

Overall, there is the potential for avoiding 60 million kg N and 2 million kg P from reaching the streams and rivers of the northern ORB as a result of conversion of marginal farmland to tree planting. This represents a significant fraction of the goal of the USEPA Gulf of Mexico Hypoxia Task Force to reduce TN and TP reaching the dead zone in the Gulf of Mexico.

First Journal paper on Credit Calculation Methods.

Published June 2014

Attenuation Coefficients for Water Quality Trading

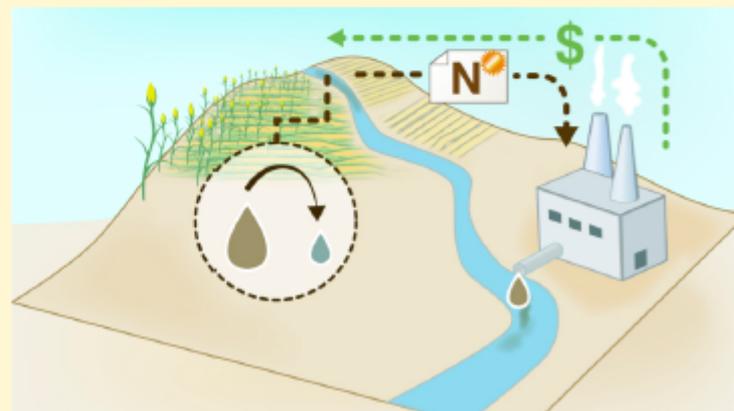
Arturo A. Keller,^{*,†} Xiaoli Chen,[†] Jessica Fox,[‡] Matt Fulda,[†] Rebecca Dorsey,[†] Briana Seapy,[†] Julia Glenday,[†] and Erin Bray[†]

[†]Bren School of Environmental Science and Management, University of California, Santa Barbara, California 93106-5131, United States

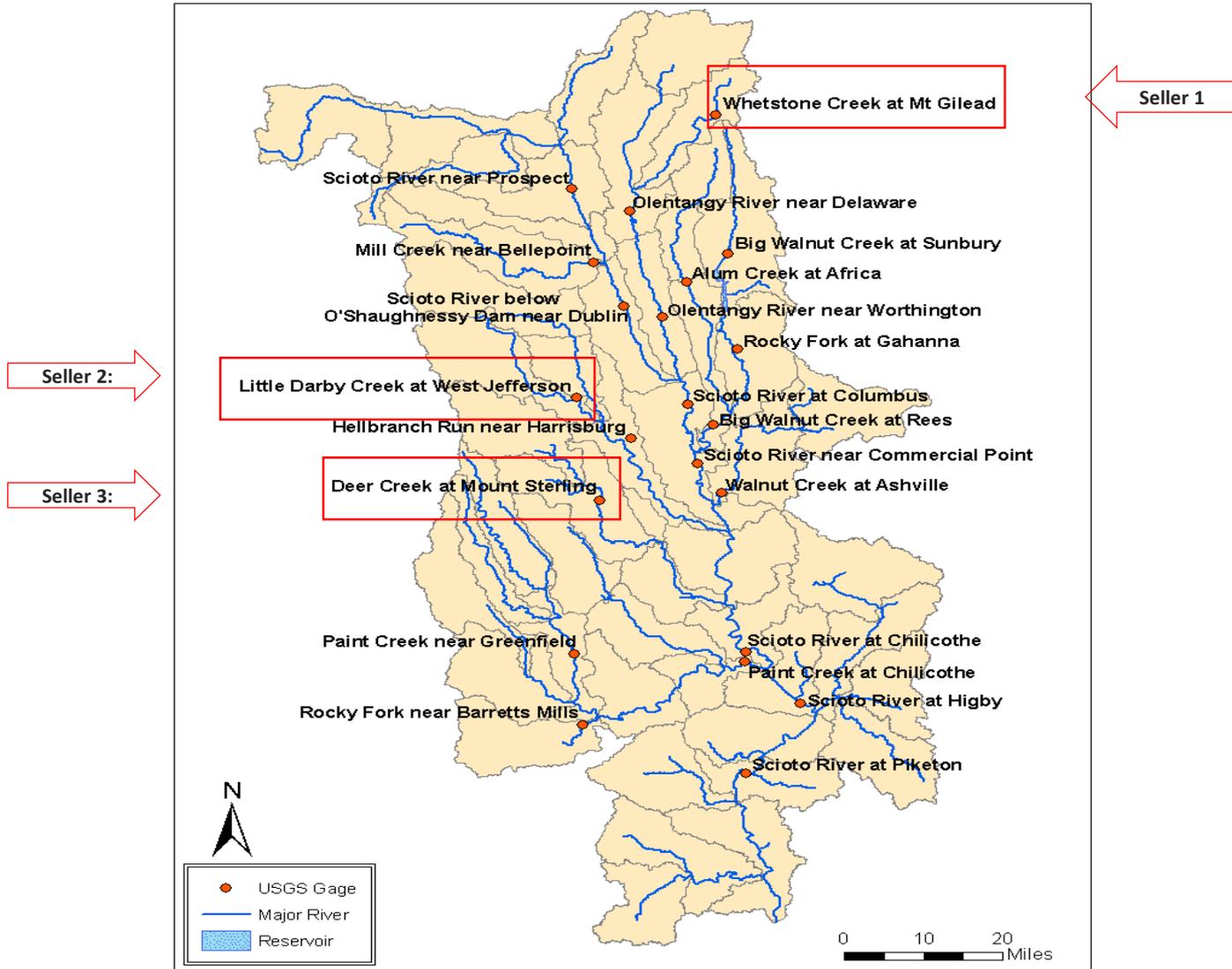
[‡]Electric Power Research Institute, Palo Alto, California 94304, United States

S Supporting Information

ABSTRACT: Water quality trading has been proposed as a cost-effective approach for reducing nutrient loads through credit generation from agricultural or point source reductions sold to buyers facing costly options. We present a systematic approach to determine attenuation coefficients and their uncertainty. Using a process-based model, we determine attenuation with safety margins at many watersheds for total nitrogen (TN) and total phosphorus (TP) loads as they transport from point of load reduction to the credit buyer. TN and TP in-stream attenuation generally increases with decreasing mean river flow; smaller rivers in the modeled region of the Ohio River Basin had TN attenuation factors per km, including safety margins, of 0.19–1.6%, medium rivers of



Attenuation Tool & Modeling Specific Locations



Farmer & Landowner Funding Available!!

Ohio River Basin Trading Project

Home

About the Project

EPRI Research

Reference Shelf

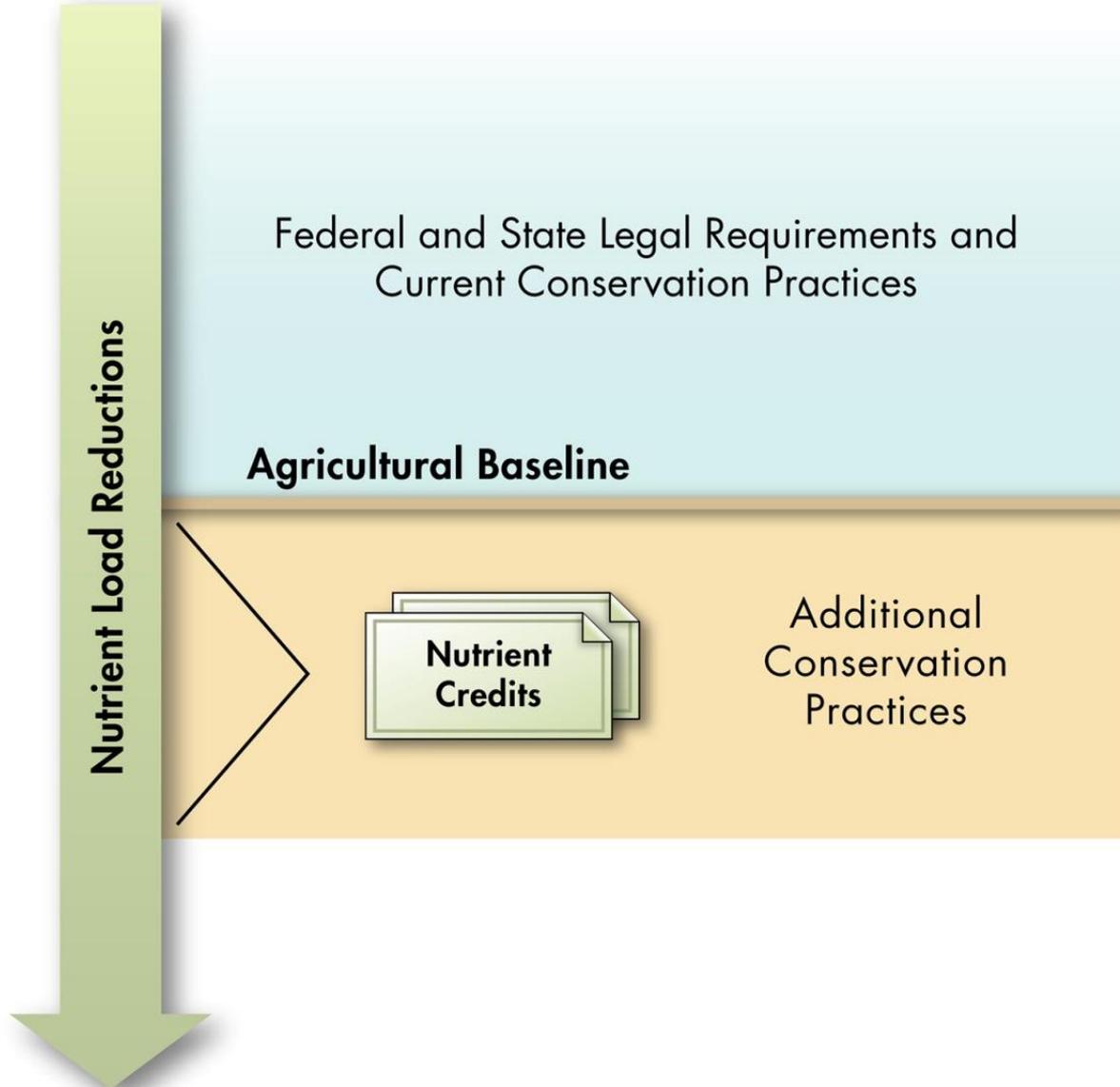
2018-2019 FUNDING OPPORTUNITY NOTICE

Priority given to forestry best management practices, [View the funding opportunity details and application](#)



Water quality trading is an innovative market-based approach to achieving water quality goals for nutrients such as phosphorus and nitrogen through programs that

Higher Loading



Federal and State Legal Requirements and Current Conservation Practices

Agricultural Baseline

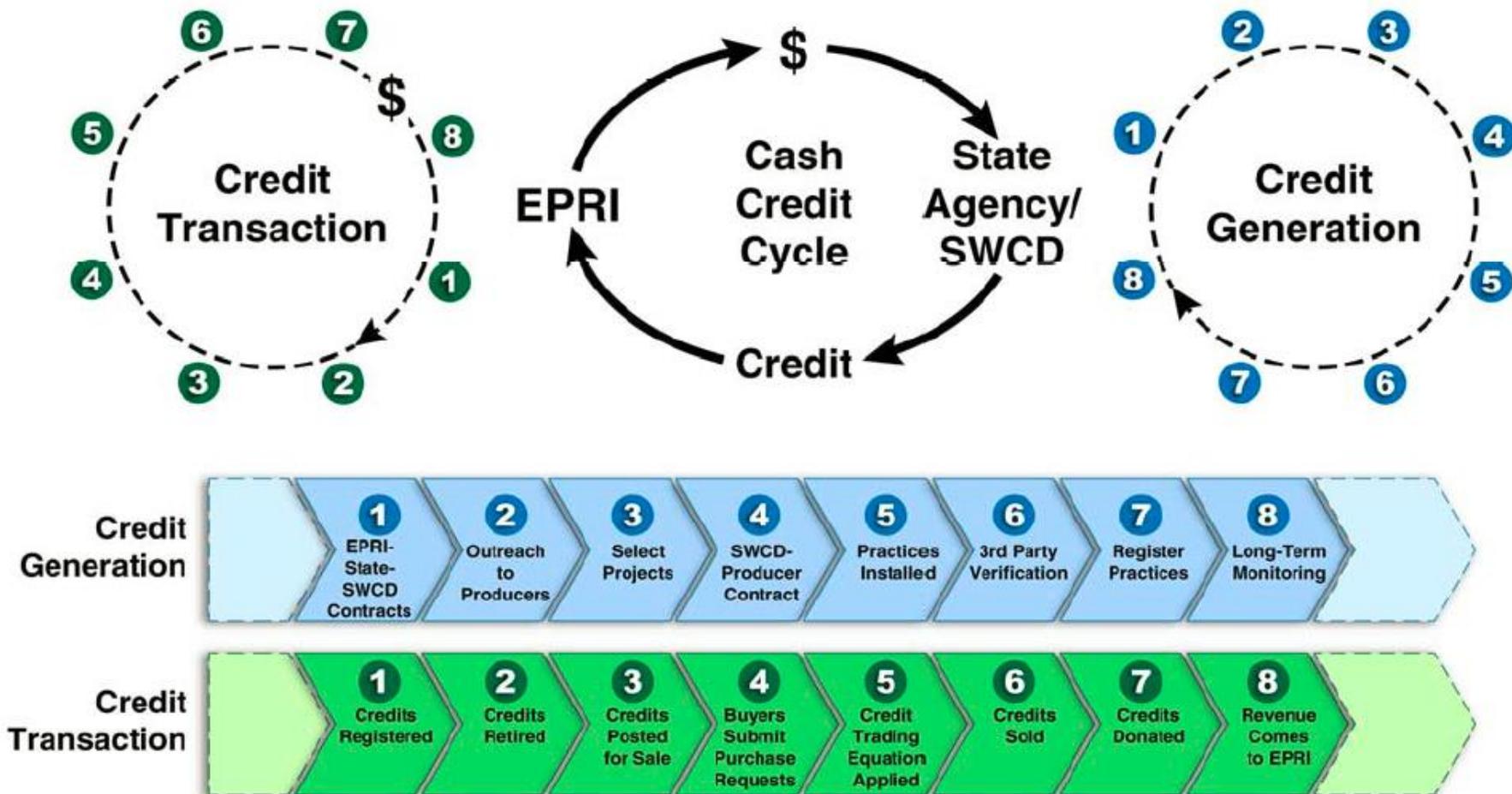
Nutrient Credits

Additional Conservation Practices

Nutrient Load Reductions

Lower Loading

Pilot Credit Process



Unleashing Credit Sales

- EPRI Challenges to Unleashing Sales:
 - Require Large(ish) Buyer Contracts
 - Non-profit research organization focus on science
 - Not established for quick, on-line, transactions

- Solution:
 - Collaborate with another organization
 - Expertise: client reach, experience with environmental credits, easy transactions for credit buyers, trusted & respected.
- FIRST CLIMATE!

Press Release: May 29, 2019



News Release

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EPRI and First Climate Bring Water Quality Credits to Environmental Stewardship Markets

PALO ALTO, Calif. – (May 29, 2019) – The Electric Power Research Institute (EPRI) and First Climate announced today an agreement that will move credits from EPRI's Ohio River Basin Water Quality Trading Project to international credit trading markets. This is a unique collaborative between a water quality project and an environmental asset credit broker to provide access to some of the world's largest environmental credit buyers.



Your climate protection and sustainability partner – since 1999

First Climate is one of the world's leading providers of climate protection solutions. We support you in achieving your sustainability and environmental goals.



Climate Neutral Services

Green Energy

Water Services

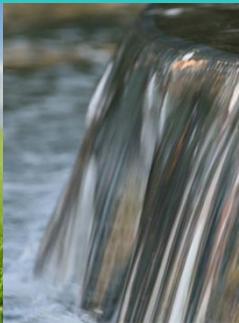
Project Development

CO₂ Compliance

Green Investments/ Asset Management

Public Climate Protection

Pellets2go



www.firstclimate.com



Sample of References



www.firstclimate.com



Frameworks and Certification Initiatives

Water framework and certification initiatives largely drive sustainable water practice in the following ways:

- Commitment to periodic evaluation and incremental improvements (i.e. quantification and audits)
- Commitment to long-term environmental ambitions (e.g. water balance and catchment engagement)
- Corporate positioning, advocacy for water issues and marketing

While some initiatives target a single driver approach, most overlap with elements of all three



The CEO Water Mandate



Context Based Water Targets





Collaboration – Meeting Supply with Demand

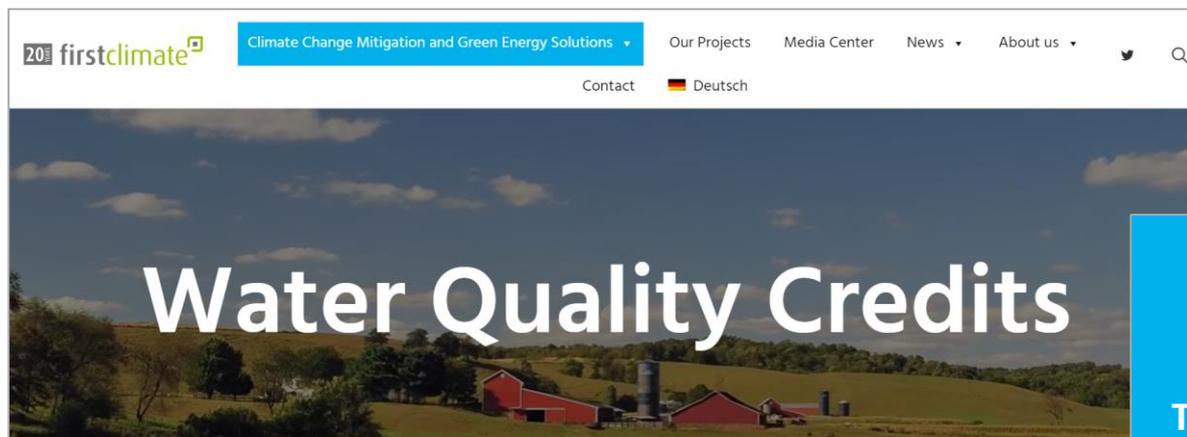


The CEO Water Mandate

www.firstclimate.com



First Climate Website – Credit Purchases



MAKE YOUR PURCHASE NOW

The first 30 buyers get a free t-shirt!

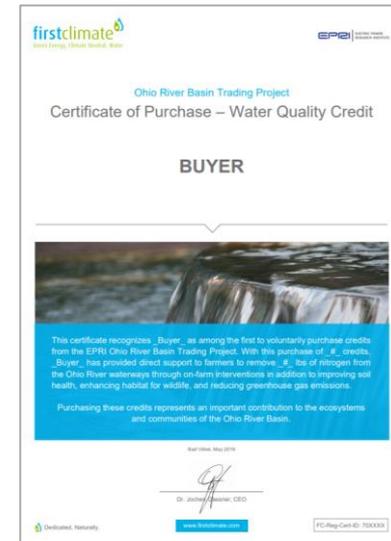
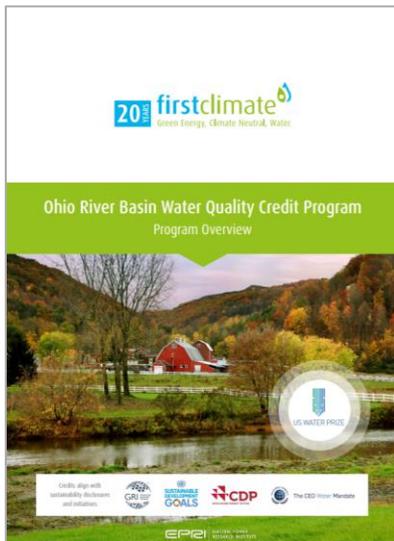
| Purchase Volume | 1 - 100 credits | 101 - 500 credits | > 500 credits |
|------------------|-----------------|-------------------|---------------|
| Unit Price (USD) | \$14 | \$13 | \$12 |



www.firstclimate.com



First Climate Website – Credit Purchases



<https://www.firstclimate.com/en/water-quality-credits/>

www.firstclimate.com



IHS Markit®

Registry Services for EPRI's Ohio River Basin (ORB) Water Quality Trading Project

June 14, 2019

Our global operations serve industry leaders worldwide

We provide both international perspective and first-hand regional insights with over 120 offices across six continents and a workforce that speaks more than 50 languages.*

14,000+ colleagues in 34 countries including...

6,000+

Americas

(60+ offices)

3,500+

Europe, Middle
East & Africa

(30+ offices)

4,500+

Asia Pacific

(20+ offices)

IHS Markit also supports local communities worldwide. Our colleagues volunteered more than 35,000 hours and supported over 600 organizations in 2016.*

* 2016 IHS Markit Sustainability
Report

Environmental Solutions

We provide environmental infrastructure solutions and administrative support to emerging environmental markets.



Registry

- Largest global voluntary registry for carbon, water and biodiversity
- 25 standards/programs
- 250 Million+ carbon credits listed
- Best Registry Provider for the 8th year (Environmental Finance)



Auctions

- Auction service provider for California, Quebec and Ontario Cap and Trade
- \$23B total value of allowances auctioned
- 35 auctions administered since 2012



Commodity Tracker

- First IHS Markit product natively designed/hosted in cloud (AWS)
- Best New Technology 2017 (Waters Technology magazine)
- Over 12,000,000 metric tons of physical inventory processed



ESG Reporting Repository

- Soft launch in July 2018
- One-stop online platform for collecting, storing and disseminating ESG data
- Phase 2 incorporates OCR and machine learning for structured data and analytics

What is a Registry?

A registry is an online infrastructure to track environmental credits through their lifecycle, comprised of comprised of three key components:

- **Technology:** online user interface and database behind the registry
- **Terms and Conditions:** rules governing the behaviour of parties using the Registry
- **Operations:** review of project documents, support of users, interaction with regulators and oversight of technology

A registry promotes:

- **Transparency**
- **Efficiency**
- **Trust**
- **Confidence**
- **Maximum participation**

ORB Trading Project: Account Registration



Ohio River Basin Trading Project **EPRI** | ELECTRIC POWER RESEARCH INSTITUTE

To request a new account please provide the following details.

Request a New Account

Organization Details

| | | |
|----------------------|----------------------|----------------------|
| Registered Name * | Trading Name * | |
| <input type="text"/> | <input type="text"/> | |
| Classification * | Tax/VAT No * | |
| Choose One.. ▾ | <input type="text"/> | |
| Address 1 * | State/Province * | |
| <input type="text"/> | <input type="text"/> | |
| Address 2 | Country * | |
| <input type="text"/> | Choose One.. ▾ | |
| City * | Zip/Postcode * | Website * |
| <input type="text"/> | <input type="text"/> | <input type="text"/> |

Main Contact

| | |
|----------------------|----------------------|
| Name * | Email * |
| <input type="text"/> | <input type="text"/> |
| Phone * | |
| <input type="text"/> | |

Billing Contact

| | |
|----------------------|----------------------|
| Name * | Email * |
| <input type="text"/> | <input type="text"/> |
| Phone | |
| <input type="text"/> | |

ORB Trading Project: Registry Public View (Projects)



Ohio River Basin Trading Project **EPRI** | ELECTRIC POWER RESEARCH INSTITUTE

Ohio River Basin - Water Quality Trading Project

Clear Search:

| Account Holders | Projects | Issuances / Listings | Holdings | Retired Credits | Cancelled Units | | | | | |
|-----------------|----------------------|----------------------|-------------------|------------------|-------------------|--|----------------------------------|---------|--|--|
| △ Project Name | Account Name | Project Type | Installation Date | State / Province | Watershed (HUC 4) | Sub-Watershed (HUC 10) | BMP | Details | | |
| IN-029-2013-106 | Dearborn County SWCD | Nitrogen Reduction | 04 Sep 2013 | IN | Middle Ohio | South Hogan Creek-North Hogan Creek | Feedlot: Waste Management System | View | | |
| IN-029-2013-106 | Dearborn County SWCD | Phosphorus Reduction | 04 Sep 2013 | IN | Middle Ohio | South Hogan Creek-North Hogan Creek | Feedlot: Waste Management System | View | | |
| IN-115-2013-108 | Ohio County SWCD | Nitrogen Reduction | 26 Aug 2013 | IN | Middle Ohio | South Fork Laughery Creek-Laughery Creek | Feedlot: Waste Management System | View | | |
| IN-115-2013-108 | Ohio County SWCD | Phosphorus Reduction | 26 Aug 2013 | IN | Middle Ohio | South Fork Laughery Creek-Laughery Creek | Feedlot: Waste Management System | View | | |
| IN-115-2013-109 | Ohio County SWCD | Phosphorus Reduction | 20 Nov 2013 | IN | Middle Ohio | Gunpowder Creek-Ohio River | Feedlot: Waste Management System | View | | |

ORB Trading Project: Registry Public View (Project Details)



Ohio River Basin Trading Project **EPRI** | ELECTRIC POWER RESEARCH INSTITUTE

Ohio River Basin - Water Quality Trading Project

Account Holder

Dearborn County SWCD

Description

Heavy Use Area Protection

Documents

- (ORB) Certification Report (01 Dec 2013-30 Nov 2014)
- (ORB) Certification Report (01 Dec 2014-30 Nov 2015)
- (ORB) Certification Report (01 Dec 2015-30 Nov 2016)
- (ORB) Certification Report (01 Dec 2016-30 Nov 2017)
- (ORB) Credit Calculation Report (01 Dec 2012-30 Nov 2013)
- (ORB) Credit Release Letter (01 Dec 2012-30 Nov 2013)
- (ORB) Credit Release Letter (01 Dec 2013-30 Nov 2014)
- (ORB) Credit Release Letter (01 Dec 2014-30 Nov 2015)
- (ORB) Credit Release Letter (01 Dec 2015-30 Nov 2016)
- (ORB) Credit Release Letter (01 Dec 2016-30 Nov 2017)
- (ORB) Regulatory Certification Report (01 Dec 2012-30 Nov 2013)
- (ORB) SWCD Installation Report (01 Dec 2012-30 Nov 2013)
- (ORB) Verification Report (01 Dec 2016-30 Nov 2017)
- (ORB) Verification Report (01 Dec 2015-30 Nov 2016)
- (ORB) Verification Report (01 Dec 2014-30 Nov 2015)
- (ORB) Verification Report (01 Dec 2013-30 Nov 2014)
- (ORB) Verification Report (01 Dec 2012-30 Nov 2013)

Units

| Category | Project Type | Watershed (HUC 4) | Sub-Watershed (HUC 10) | Nutrient Type | BMP | Calculation Methodology | Potential Ancillary Benefits |
|-----------------------------------|----------------------|-------------------|-------------------------------------|---------------|----------------------------------|-------------------------|---|
| Water Quality IN,United States | Nitrogen Reduction | Middle Ohio | South Hogan Creek-North Hogan Creek | Nitrogen | Feedlot: Waste Management System | EPA Region 5 Model | Water Quantity,Carbon sequestration,Soil health and erosion |
| Water Quality IN,United States | Phosphorus Reduction | Middle Ohio | South Hogan Creek-North Hogan Creek | Phosphorus | Feedlot: Waste Management System | EPA Region 5 Model | Water Quantity,Carbon sequestration,Soil health and erosion |

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Social Aspects and Stories: Watch on YouTube



Aligning with Sustainability Principles & Disclosures



The CEO Water Mandate

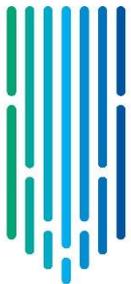
Coming Fall 2019:

Guidance Document to describe mapping of WQ credit to various sustainability disclosures and corporate reporting.

Credibility

“Through solid science, transparency, and 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.”

Bob Perciasepe, President, Center For Climate and Energy Solutions
Former Deputy Administrator, United States Environmental Protection Agency



US WATER PRIZE



**Environmental
Finance
Voluntary Carbon
Markets Rankings
WINNER**



Brooks Smith, Partner, Troutman Sanders
Recognized as “Best Lawyer in America”

Communication & Outreach



EPRI @EPRINews · Oct 26

Regenerating forests play an important role in improving #WaterQuality. Today, we planted 3 of more than 3,000 trees that will be planted at Coyote Run Farm to help reduce nutrient runoff into watersheds.

Ohio EPA, ODA and Indiana Dept of Ag

National Public Radio 2016-2017



Credit Pool and Pipeline

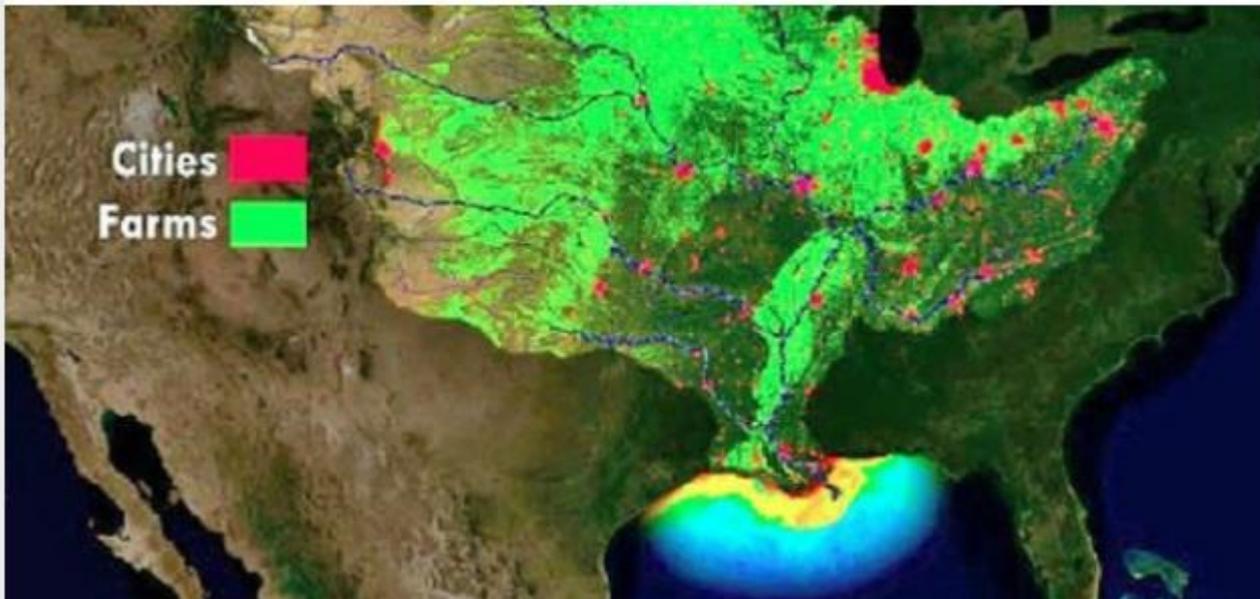
- 100,000 Credits Available **NOW**
- Pipeline of Credits:
 - 10-40 year agreements with landowners in place.
 - Credits for Forestry Projects coming on-line in 2019
 - Credits from other BMPs continuing (cover crops, cattle exclusion fencing, milk house waste management, heavy use areas, etc).

June 12, 2019 Article (2 days ago)

June 12, 2019

'Dead zone' predicted to become 2nd largest on record in Gulf of Mexico this summer

By **Chaffin Mitchell**, AccuWeather staff writer



Global Reach!!!

Food

Milk

Beef

Corn

Soy

Tobacco

Bourbon/Beer

Corporate

Walmart

Eli Lilly

Jim Beam

Wendy's

JP Morgan Chase

Limited Brands

Proctor & Gamble

KFC/Pizza Hut

Honda

How much should I purchase??

- Compliance Estimates
 - We can run estimates or discuss with your permitting authority.
- Corporate/Organizational Credit Estimates
 - Call EPRI or First Climate
- Personal Nitrogen Estimates:

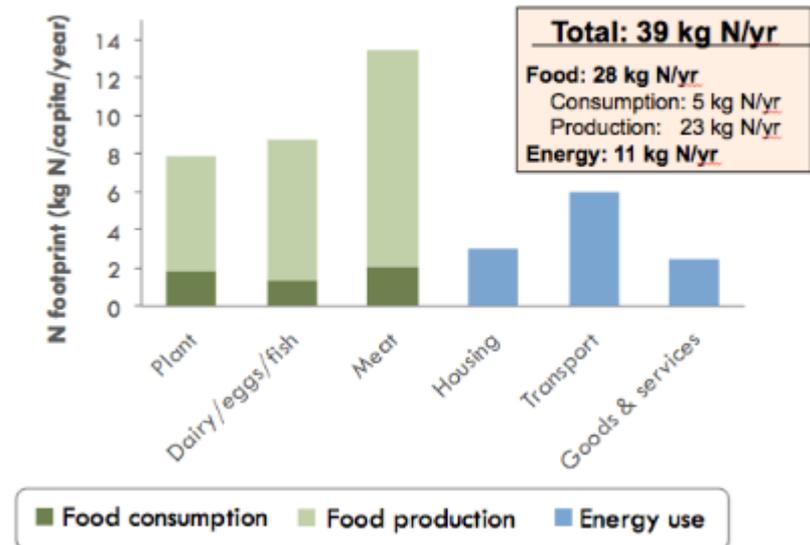


<http://n-print.org/>

James Galloway, University of Virginia

Allison Leach, University of New Hampshire

Personal N footprint in the US



Purchase Credits Now!

- Credit sales fund our next round of farmer opportunities.
- <https://www.firstclimate.com/en/water-quality-credits/>



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Ohio River Basin Trading Project

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Ohio River Basin Water Quality Trading Project



EPRI is conducting trailblazing work to create trading exchanges that assign economic value to the improvement of water quality across the Ohio River Basin. [Watch our Videos](#) | [View our Infographic](#) (1.3 MB)

Key Resources

"Integrating co-benefits produced with water quality BMPs into credits markets: Conceptualization and..."

Credits for Sale

Working with small farmers, our water quality credits protect watersheds by providing a science-based option for those seeking to mitigate supply chain impacts and meet personal environmental footprint goals as well as larger corporate targets and permit compliance obligations.

In the News

EPRI and First Climate Bring Water Quality Credits to Environmental Stewardship Markets | 5/29/2019 - *Global Banking and Finance*



Together...Shaping the Future of Electricity