

Water Quality Trading and Stewardship Credits to Meet Sustainability Goals

Rebecca Madsen
Technical Leader

**Partners for Pollution Prevention Spring
Quarterly Meeting**
April 6, 2017



Agenda

- Background on water quality trading
- The Ohio River Basin Water Quality Trading Project
- Stewardship credits & business value
 - State corporate environmental leadership awards
 - Sustainability goals
 - Other benefits

Water Quality Trading Basics

https://youtu.be/woqkP9c0Dlg?list=PLphKrnecF69WvqhErCE8n90ptIHV_Q-HR

Water Quality Trading Basics

...an exchange of pollutant reduction credits to meet compliance



What gets traded:

Nutrients (N, P), biological oxygen demand (BOD), total suspended solids (TSS), temperature (kcal)

The Ohio River Basin Water Quality Trading Project

Excess nutrients in the Ohio River Basin can lead to algal blooms that deplete oxygen and lead to "dead zones"

THE PROBLEM

Nutrients come from many sources, such as...

- ▶ Farm runoff from fertilizer and manure
- ▶ Urban runoff from stormwater, septic systems, and end-of-pipe dischargers
- ▶ Air deposition from cars and other emissions

A SOLUTION

Water Quality Trading

Is a market-based approach to achieving water quality goals by allowing permitted dischargers to generate or purchase pollution reduction credits from another source.

HOW IT WORKS

1 A facility such as a power plant or wastewater treatment plant needs to meet nutrient limits for its water quality permit. Water quality trading is one option.

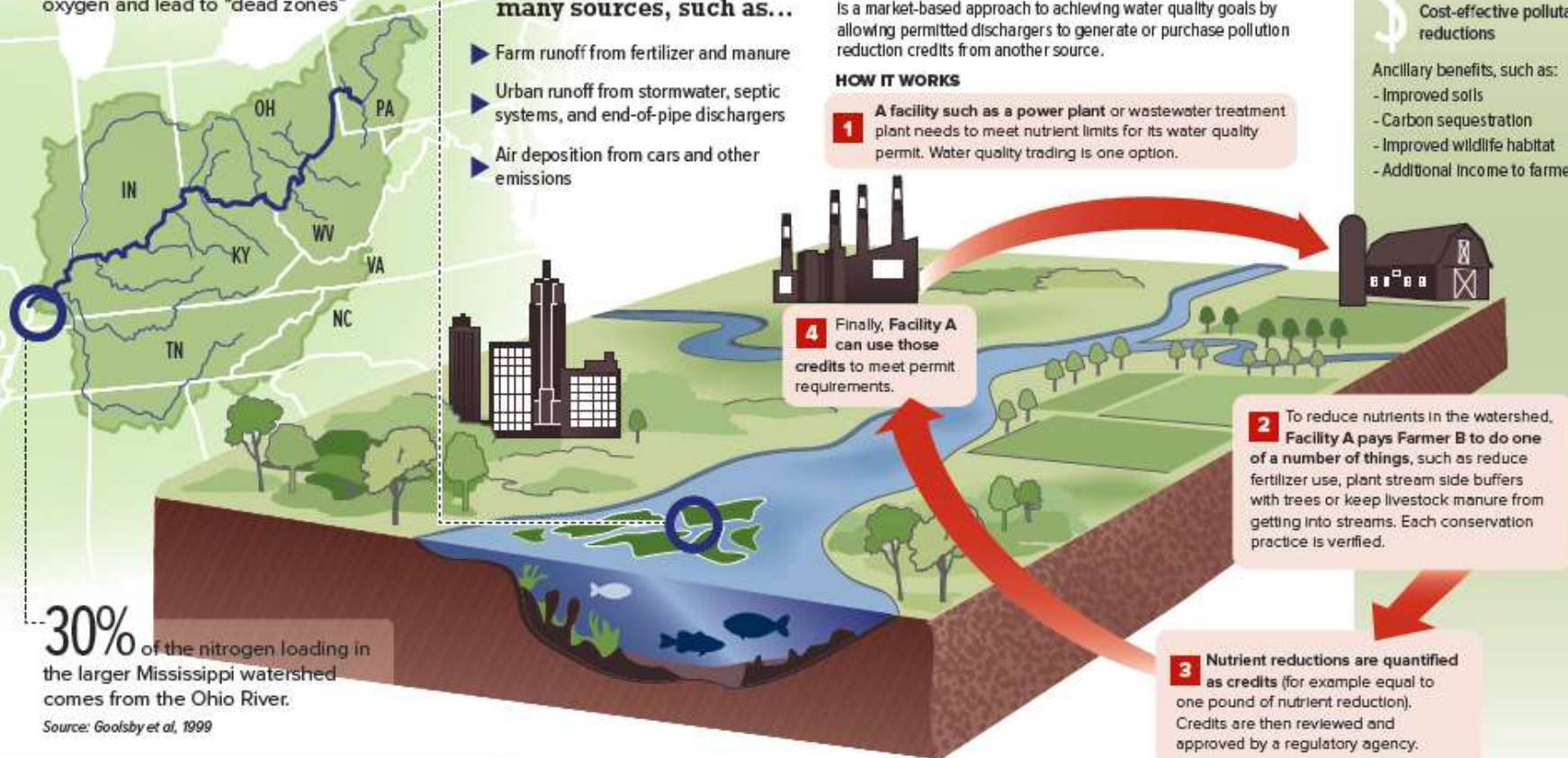


Benefits

Cost-effective pollutant reductions

Ancillary benefits, such as:

- Improved soils
- Carbon sequestration
- Improved wildlife habitat
- Additional income to farmers



30% of the nitrogen loading in the larger Mississippi watershed comes from the Ohio River.

Source: Goolsby et al, 1999

Water Quality Trading Project – Ohio River Basin

First-of-its-kind interstate program spans Ohio, Indiana, and Kentucky to evaluate the use of trading by industries, utilities, farmers, and others to meet water quality goals while minimizing costs.

Find more information at: wqt.epri.com

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

The pilot trading period, from 2013-2015, is expected to reduce nutrients by ...

30,000 lbs of Phosphorous

66,000 lbs of Nitrogen

That's equivalent to keeping 2,950 50-lb bags of fertilizer out of the Ohio River.



http://wqt.epri.com/pdf/EPRI_WQTinfographic.pdf

Regulatory Background of Water Quality Trading

- Rooted in Clean Water Act National Pollutant Discharge Elimination System (NPDES) permit
- EPA: 2003 policy, 2007 guidance
- State policies in: PA, VA, NC, WV, OH, MI, WI, MN, MT, CO, ID, OR, WA



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You are here: [Water](#) » [Our Waters](#) » [Watersheds](#) » [Water Quality Trading](#) » [Final Water Quality Trading Policy](#)

Final Water Quality Trading Policy

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

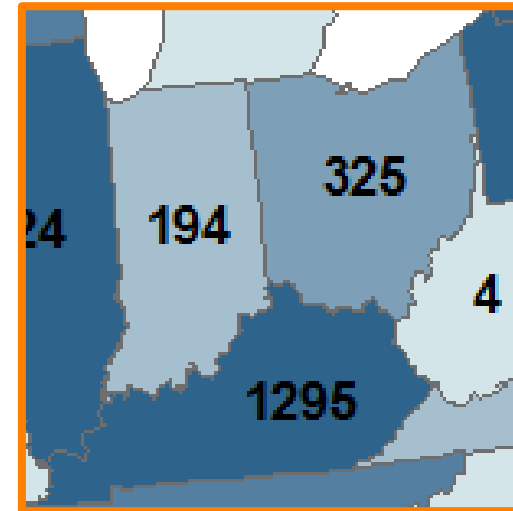
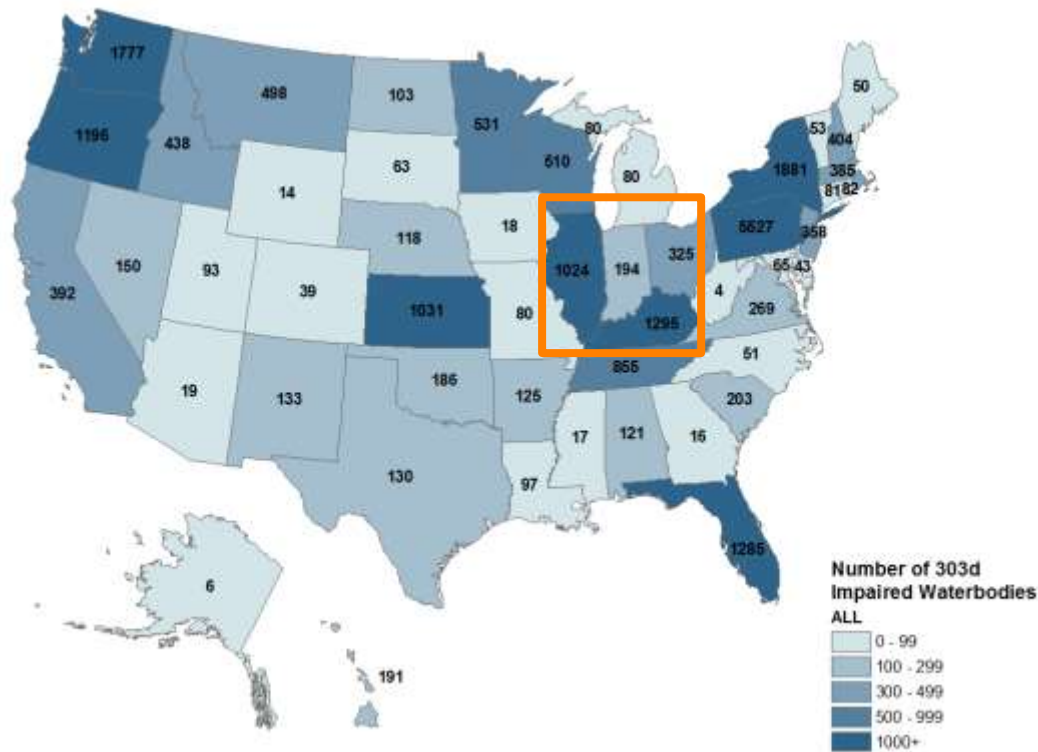
Office of Water
Water Quality Trading Policy
January 13, 2003

I. Background and Purpose of the Policy

The Clean Water Act (CWA)¹ was enacted in 1972 to restore and maintain the chemical, physical, and biological of the nation's waters. It established a national policy that called for the discharge of pollutants to be eliminated and established interim goals for protecting fish, wildlife and recreational uses. The CWA also established a national development and implementation of programs so the goals of the Act could be met through controls of point and nonpoint sources of pollution. Congress recognized and preserved the primary responsibilities and rights of the States to prevent, reduce and eliminate pollution.

The application of technology and water quality based requirements through the National Pollutant Discharge Elimination System (NPDES) permit program has achieved and remains critical to success in controlling point source pollution and restoring the nation's waters. Despite these accomplishments approximately 40% of the rivers, 45% of the streams and 50% of the lakes that have been assessed still do not support their designated uses². Sources of pollution such as storm water, agricultural runoff and atmospheric deposition continue to threaten our nation's waters. Nutrient loading from agriculture and storm water are significant contributors to water quality problems such as in the Gulf of Mexico and decreased fish populations in Chesapeake Bay. Population growth and development

Status of Impaired Waters



- *Total aggregated number of waters impaired by nutrients, organic enrichment/oxygen depletion, sediments, and temperature in the United States*
 - From EPRI report: Status of Water Quality Regulations and Their Impact on Water Quality Trading in the United States (3002006262)

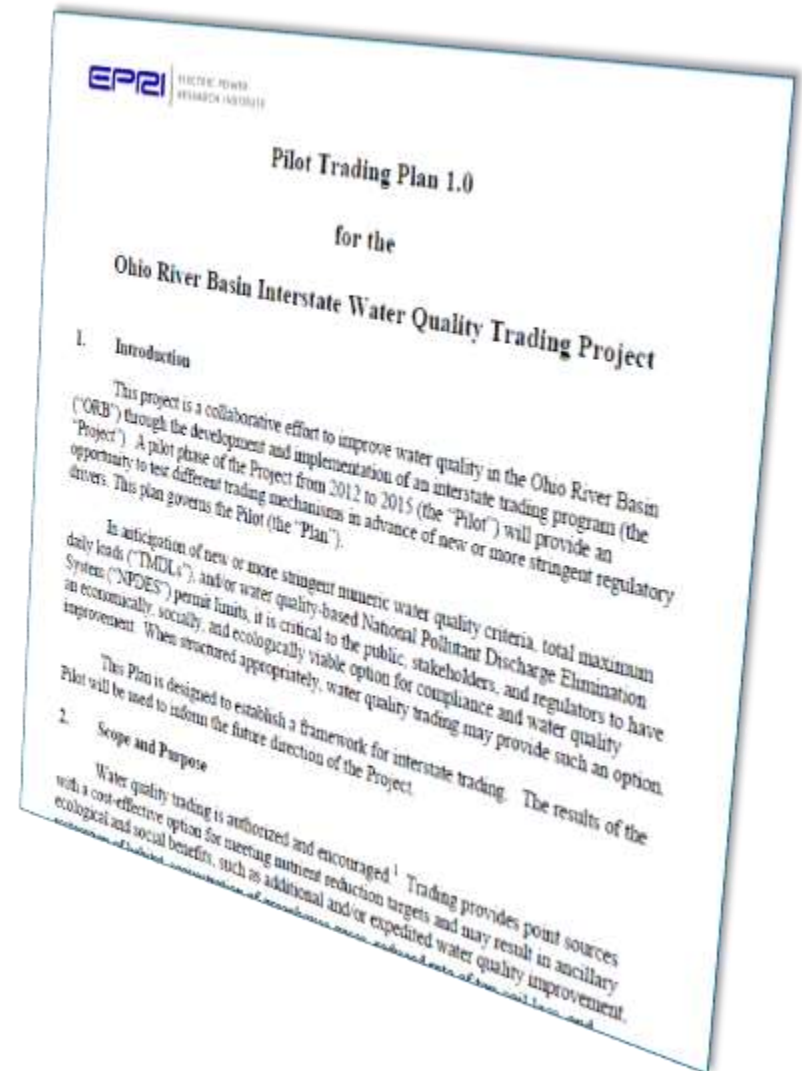
Ancillary Benefits

- Improved Soils
- Carbon Sequestration
- Pollinators
- Biodiversity
- Corporate Stewardship
- Private money to farmers
- Support local communities
- ...it's a “green infrastructure” approach



Ohio River Water Quality Trading Project

- EPRI-sponsored
- Regional interstate water quality trading framework
 - Watershed model
 - Interstate trading agreement
 - Pilot trades 2013-2018
- Voluntary / pre-compliance



**Pilot program plan, presentations,
resources, technical papers:**

<http://wqt.epri.com>


EPRI's Focus in Water Quality Trading

- Based on research, EPRI identified opportunities to improve the implementation of WQT.
- A pilot project provides a platform to test approaches, engage stakeholders, and advance theoretical debates.

“Can WQT be a socially, ecologically, and economically viable?”

- ✓ Ecologically
- ✓ Socially
- Economically?

Watershed Model: WARMF



U.S. ENVIRONMENTAL PROTECTION AGENCY

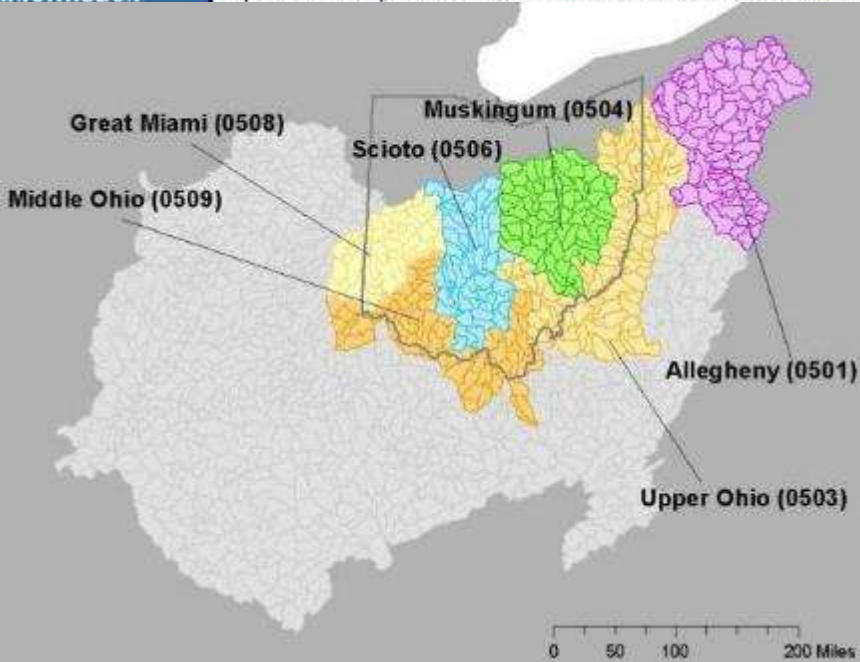
Ecosystems Research Division

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You are here: [EPA Home](#) » [athens](#) » [wwqtsc](#) » [html](#) » Watershed Analysis Risk Management Framework (WARMF)

Watershed Analysis Risk Management Framework (WARMF)

To facilitate TMDL analysis and watershed planning, WARMF was developed under sponsorship from the Electric Power Research Institute (EPRI) as a decision support system that provides a road map to calculate TMDLs for most pollutants (nutrients). It also provides a road map to guide implementation plan. The scientific basis of the model is based on several peer reviews by independent experts. The model is organized into five (5) linked modules under one, very user friendly tool suitable for expert



WWQTCS Info

- [WWQTCS Home](#)
- [Technical Support](#)
- [Tools](#)
 - [Watershed Model](#)
 - Basins
 - LSPC
 - WAMView
 - SWMM
 - WARMF
 - [Water Quality Model](#)
 - WASP
 - QUAL2K
 - Aquatox
 - EPD-RIV1
 - [Hydrodynamic Model](#)
 - HEC-RAS

Online Credit Registry



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				
Retirement Date	Vintage	Project	Account	Project Type	Retirement Quantity	Measurement	Type	Details	
06 Mar 2014	2013	IN-177-2013-111	AEP	Phosphorus Reduction	403	TP lbs/year	UNIT	View	
Serial No.: ORB-BAW-US-103000000005902-01122012-30112013-183599.001-184002-MER-0-P									
06 Mar 2014	2013	IN-177-2013-111	AEP	Nitrogen Reduction	809	TN lbs/year	UNIT	View	
Serial No.: ORB-BAW-US-103000000005902-01122012-30112013-184103.001-184912-MER-0-P									
06 Mar 2014	2013	OH-029-2013-104	AEP	Nitrogen Reduction	338	TN lbs/year	UNIT	View	
Serial No.: ORB-BAW-US-103000000006082-01122012-30112013-191270.001-191608-MER-0-P									
06 Mar 2014	2013	IN-115-2013-108	AEP	Nitrogen Reduction	91	TN lbs/year	UNIT	View	
Serial No.: ORB-BAW-US-103000000005550-01122012-30112013-177677.001-177768-MER-0-P									
06 Mar 2014	2013	IN-137-2013-105	AEP	Phosphorus Reduction	59	TP lbs/year	UNIT	View	
Serial No.: ORB-BAW-US-103000000005898-01122012-30112013-180588.001-180647-MER-0-P									
06 Mar 2014	2013	IN-137-2013-102	Duke Energy	Phosphorus Reduction	22	TP lbs/year	UNIT	View	
Serial No.: ORB-BAW-US-103000000005895-01122012-30112013-182758.001-182780-MER-0-P									
06 Mar 2014	2013	IN-115-2013-108	Duke Energy	Nitrogen Reduction	46	TN lbs/year	UNIT	View	
Serial No.: ORB-BAW-US-103000000005550-01122012-30112013-177768.001-177814-MER-0-P									
06 Mar 2014	2013	IN-137-2013-103	Duke Energy	Nitrogen Reduction	19	TN lbs/year	UNIT	View	
Serial No.: ORB-BAW-US-103000000005896-01122012-30112013-183237.001-183258-MER-0-P									
06 Mar 2014	2013	IN-029-2013-106	Duke Energy	Nitrogen Reduction	374	TN lbs/year	UNIT	View	
Serial No.: ORB-BAW-US-103000000005996-01122012-30112013-174927.001-175301-MER-0-P									

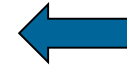
<https://mer.markit.com/br-reg/public/orb/index.jsp?s=cp>

Ohio River Basin Trading Project Receives U.S. Water Prize!



The U.S. Water Prize honors individuals, institutions, and organizations that have made an outstanding achievement in the advancement of sustainable solutions to national water challenges.

Example Project



Before

Runoff, erosion,
sedimentation.

After



‘Heavy Use Area Protection’

No erosion, no sedimentation,
easier manure management,
proud farmer.



Our Farmers

THE WALL STREET JOURNAL

U.S. NEWS

Trading System Tackles Waste

New Plan Pays Farmers to Curb Agricultural Runoff That Pollutes the Gulf of Mexico

By Matt Perini

NEW MADISON, Ohio—Kevin Hollinger planted soybeans and corn last fall in his corn and soybean fields, but he isn't planning to harvest them. Instead, he is letting the crops sit over the winter to improve the soil and keep fertilizer and other nutrients from running into nearby waterways.

"I could hardly go to town without someone asking, 'What's that in your field?'" said Mr. Hollinger, a fourth-generation farmer.

Helping to fund the fall for his experiment is a pilot program set to launch July next month. Farmers in the Ohio River basin are being paid to make changes—like what they plant to how they handle manure—in an effort to curtail runoff that can cause hypoxia, or low oxygen levels, in waterways.

Winter runoff plays a role, nearly 5,000 miles downstream from Mr. Hollinger's farm, in the formation of the so-called dead zone in the Gulf of Mexico—an area where fish and other aquatic life can't survive and which is considered one of the nation's largest water pollution problems.

Shrinking the dead zone—which was first recently the case of the Mississippi—has challenged regulators. Runoff that flows down the Mississippi River and east up to the Gulf carries three barrels of nutrients of various kinds more than a dozen states.

"It takes a long time to address such a large watershed and such a significant problem," said Nancy French, acting assistant administrator for water at the U.S. Environmental Protection Agency.

The agency doesn't have the power to regulate most farms, and leaves controlling nutrient levels in lakes, rivers and streams largely to the states. Environmental groups, who argue the status quo is untenable, have sued the EPA to force it to set acceptable levels for nitrogen and phosphorus in the Mississippi basin.

Increasingly, several government and industry groups, including the Electric Power Research Institute, the research arm of the U.S. utility industry, are trying an approach outside of traditional regulation. The institute is setting up a trading system,



Ohio farmer Kevin Hollinger has planted winter crops to keep fertilizer from running into nearby waterways.

Into the Dead Zone

Agricultural runoff in waterways such as the Ohio River flows into the Mississippi, carrying low oxygen levels to the Gulf of Mexico.



starting with about 30 farms across Indiana, Ohio, and Kentucky. These farms create credits by keeping manure and phosphorus from reaching the Ohio River. The credits can be sold to power plants, sewage plants and other facilities that release nutrients into local waterways.

"Our project is trying to set a cap on the amount of nutrients that can be released into the river," says Mr. Hollinger. "I don't like if we do a good job now, we can certainly beat off the need for regulation." Mr. Hollinger said, though he says he will need to see better production of a reduction in crop to stick with it.

In total, the pilot projects are

economic markets that also where is the country, according to a 2013 study by U.S. Department of Agriculture economists.

Now, "there is no regulatory backing to the voluntary plans and close being worked on. We've got the speed limit sign without a number on it," said Brad Kline, a senior attorney at the Environmental

EPRI Ohio River Basin Water Quality Trading Project



Conservation Practice: 5 year hay planting



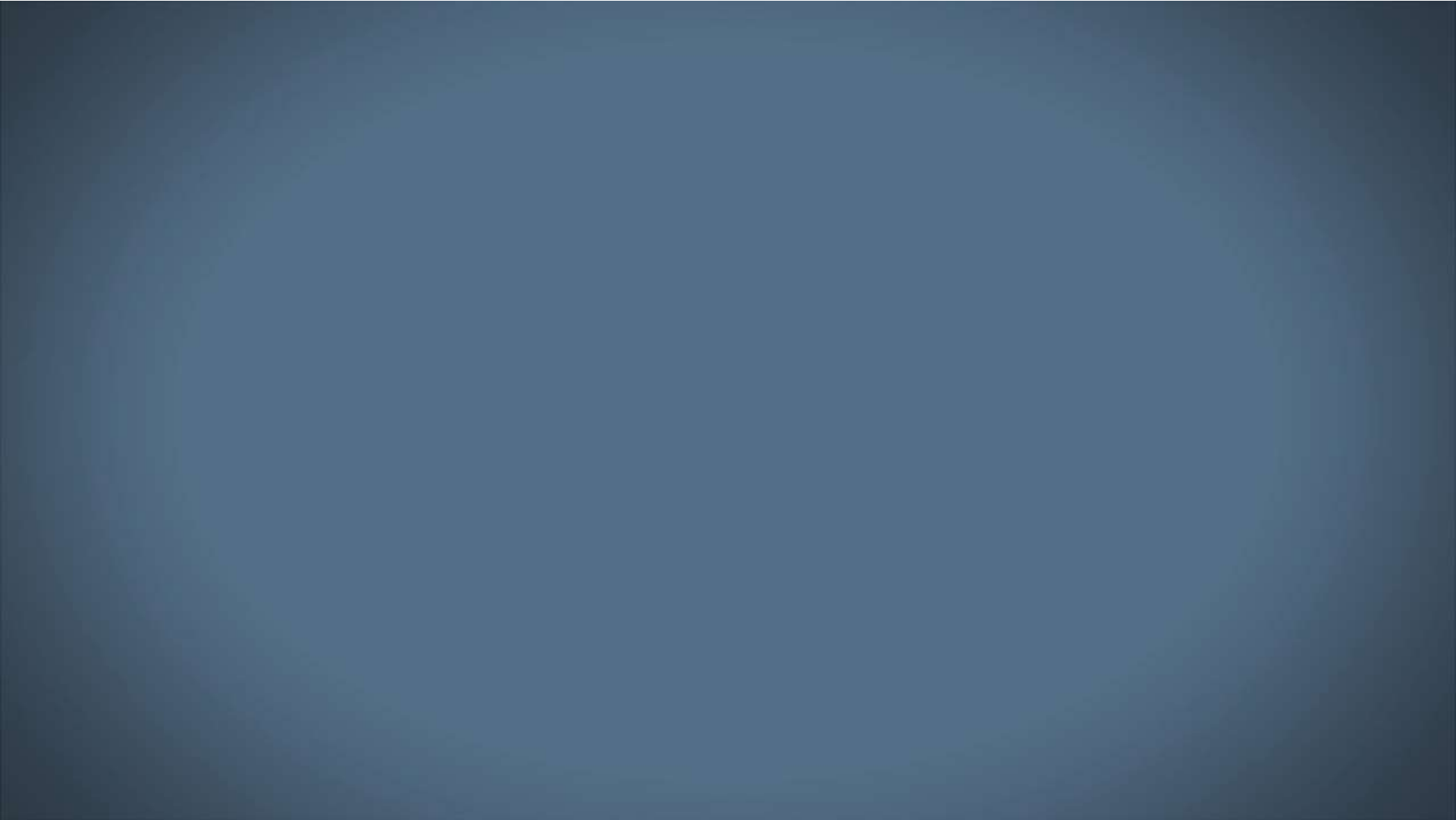
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<http://wqt.epri.com>

[Wall Street Journal](http://www.wsj.com) (2/20/2014)

From the Field: Candid Comments from our Farmers



https://youtu.be/tmUE09YO8-o?list=PLphKrnecF69WvqhErCE8n90ptlHV_Q-HR

From the Field: Candid Comments from our Farmers

“My grandpa used to catch catfish in the area. The only thing I’ve seen was a little minnow. I know that someday I’m not gonna be here and somebody else will deal with whatever I leave them. This is a much better way to leave my legacy than some people in the past have done.”



Public Radio Spot

- Ran November – January
- From Pennsylvania to Seattle.



LISTEN: “This Farm Could Be a Model for Cleaning Up the Ohio River”



<http://www.allegenyfront.org/why-big-industry-is-paying-small-farmers-to-cut-pollution-in-the-ohio-river/>

Corporate Purchase of Stewardship Credits



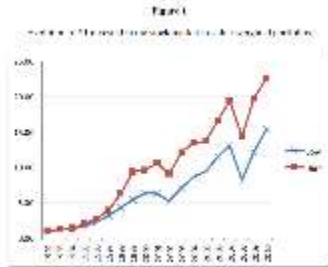
Benefits of Stewardship Credits

- Annual sustainability reports, websites, stakeholder communications, offset supply chain impacts, etc.
- Quantified conservation
- Experience with the program and demonstration towards future Clean Water Act compliance market
- Recognize credits in environmental leadership programs
- October 2013 Trading Plan
 - Permit flexibility
 - Credits can be used toward supplemental environmental project obligation

Business Drivers for Corporate Sustainability

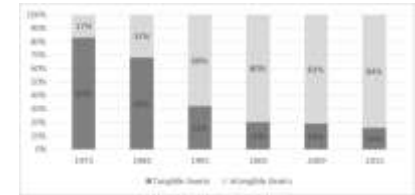
Enhances Market and Financial Performance

- Protects the Business - lowers risk
- Lowers the cost of capital



Improves Business Reputation

- Improves Stakeholder Relations
- Generates trust and customer loyalty
- "License to Operate"



Reduces Costs & Enhances Employee Engagement

- Improves employee satisfaction
- Increases employee retention

Fosters Innovation

- Encourages development of new products & services
- Responds to competitive challenges
- Builds upon existing businesses

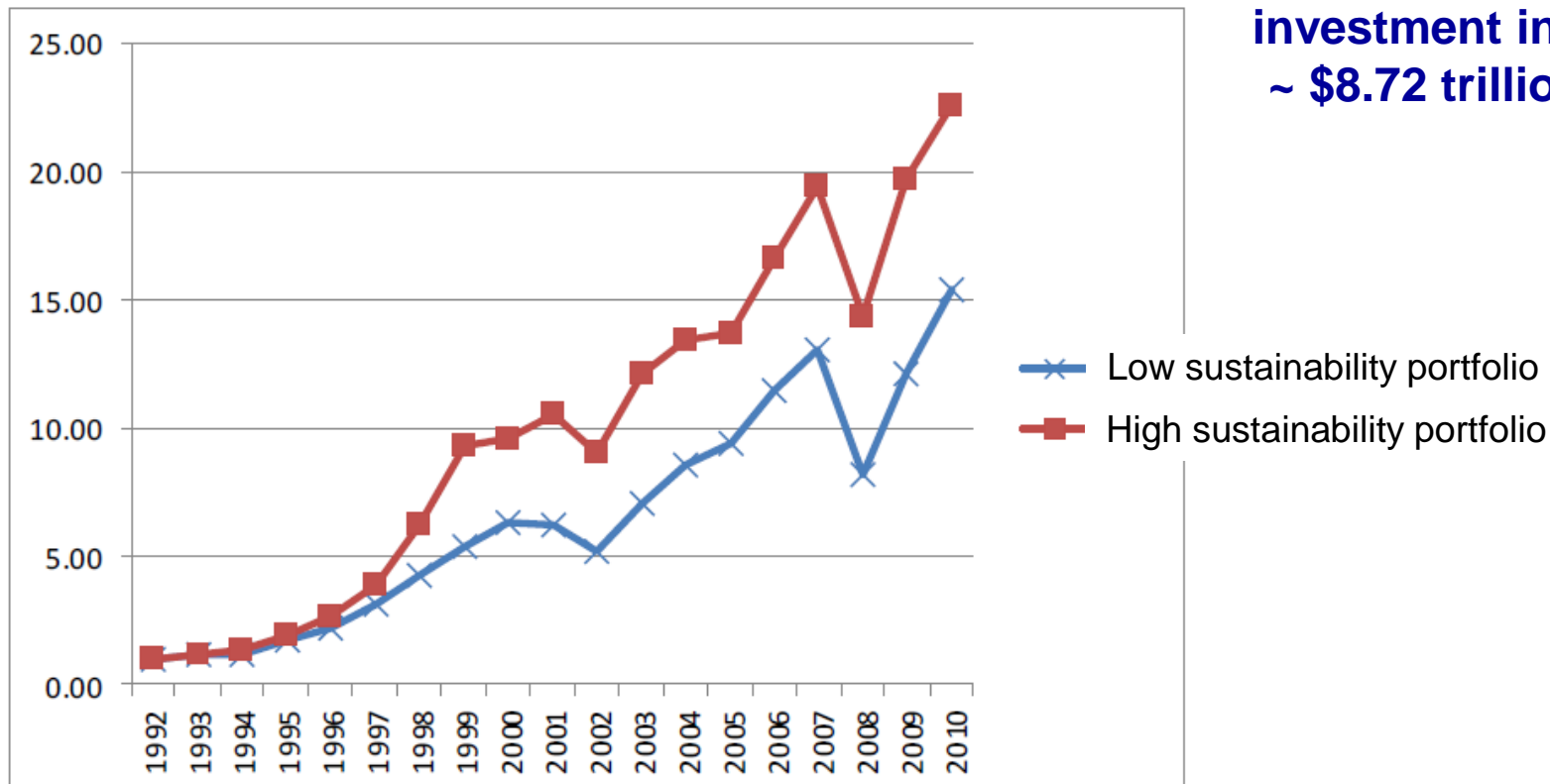


Influences Investors



Figure 1

Evolution of \$1 invested in the stock market in value-weighted portfolios

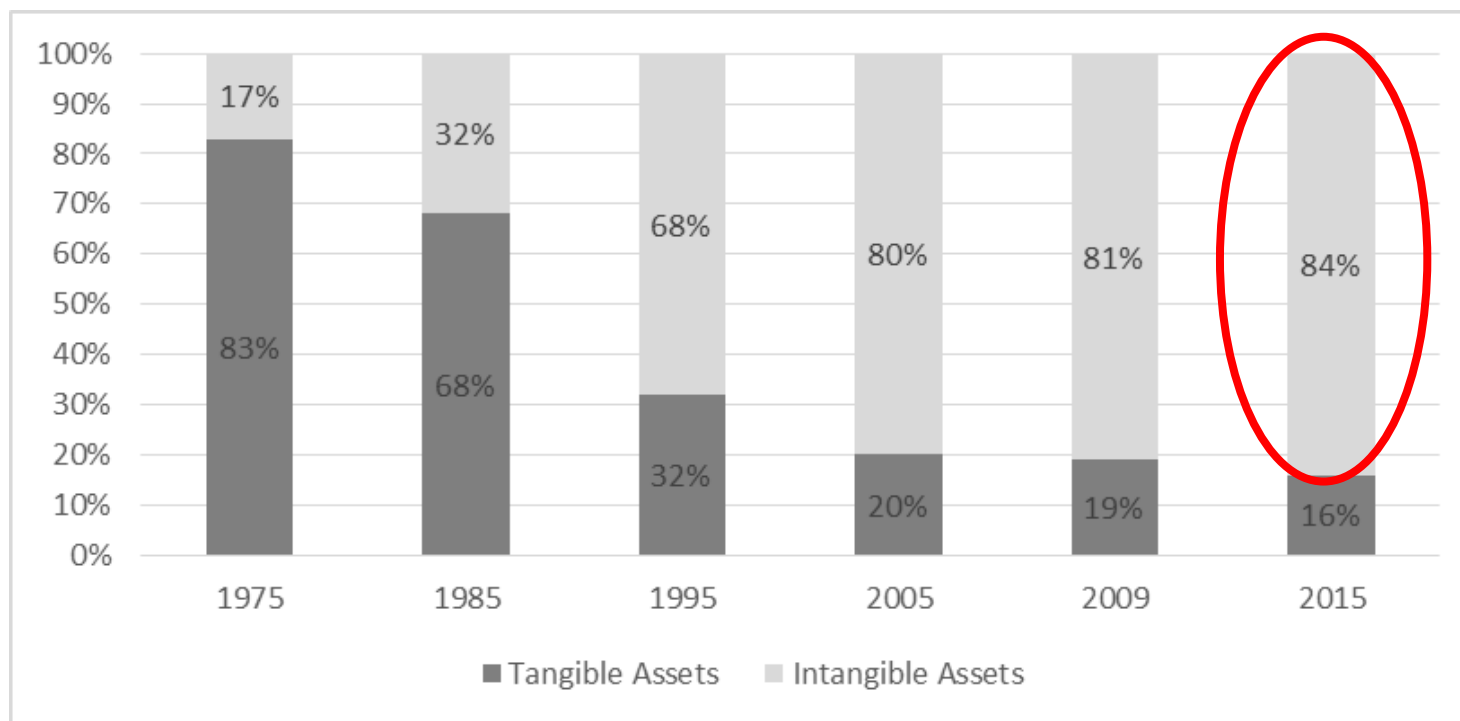


**Socially-responsible
investment in the US :
~ \$8.72 trillion (2015)**

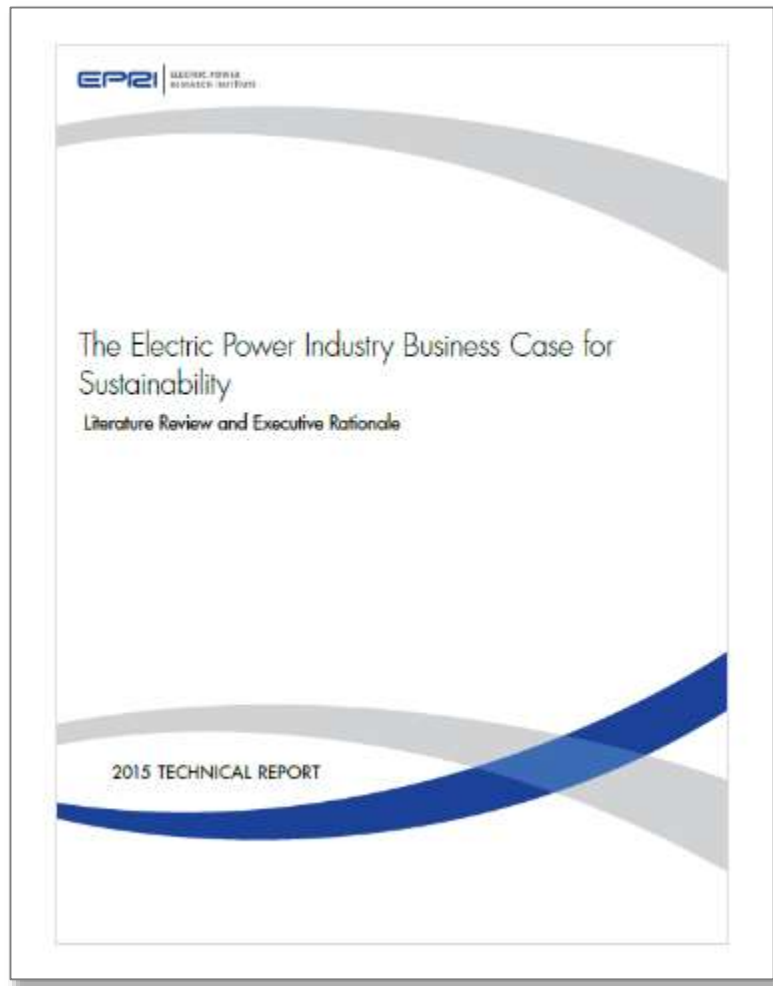
Eccles et al. (2013)

- 433 environmental, social, governance resolutions in 2015
- Company value is increasingly composed of intangible assets

Components of S&P 500 market value



Research on the Business Case for Sustainability



EPRI report #[3002005759](#)

Stewardship Credits and Sustainability

- Annual sustainability reports, websites, stakeholder communications, offset supply chain impacts, etc.

“There is potential from a broader societal basis to achieve ancillary benefits from a credit trading program that go beyond just our power plants. The fact that EPRI has created an opportunity for our company to contribute to on-the-ground improvements that have been confirmed through rigorous audit and oversight, gives us an entirely new option for meeting our broader sustainability targets.”

Mr. John McManus, *Vice President, American Electric Power*

Crosswalk of Stewardship Credits – Indiana’s Environmental Stewardship Program (ESP)

- “Committed to continuous environmental improvement”
 - For companies whose Environmental Management System (EMS) indicates water quality as an “environmental aspect” at the entity



Environmental Stewardship Program

Environmental Performance Table

Excerpt

Category	Indicator	Units
Stage: Non-product Outputs		
Discharges to Water	COD, BOD, toxics (Total or specific), total suspended solids, or sediment from runoff	Pounds, tons
	Nutrients (Total or specific)	Pounds, tons of Total N or P
	Pathogens (Total or specific)	MPN/ml, CFU/ml

Crosswalk of Stewardship Credits – Ohio and Kentucky

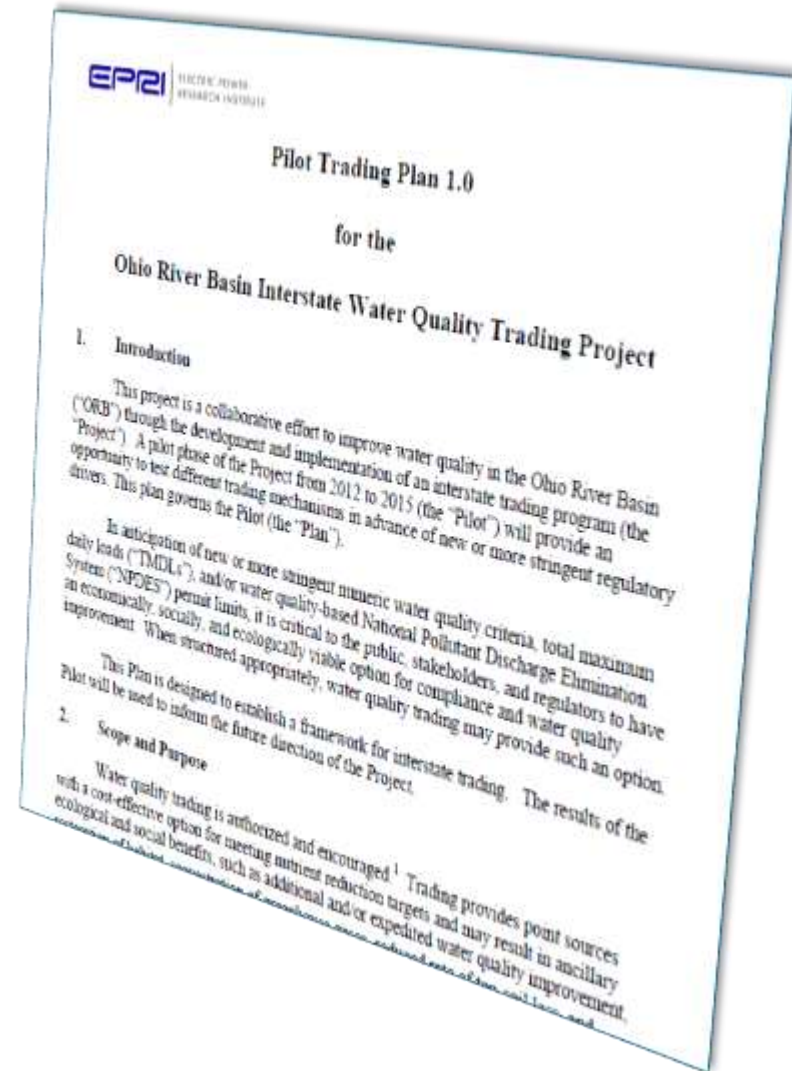
- Ohio
 - Encouraging Environmental Excellence
- Kentucky
 - KY EXCEL
 - KY EXCEL Farm



Other Business Value from Stewardship Credits

- October 2013 Trading Plan Amendment
 - Permit flexibility
 - Credits can be used toward supplemental environmental project obligation

“In recognition of the value of early and voluntary participation by the buyer, the Signatories agree that if the buyer needs permit flexibility (e.g., an extended compliance schedule) to achieve a future nutrient compliance obligation, the Signatories will provide such flexibility, to the extent allowed by law.”

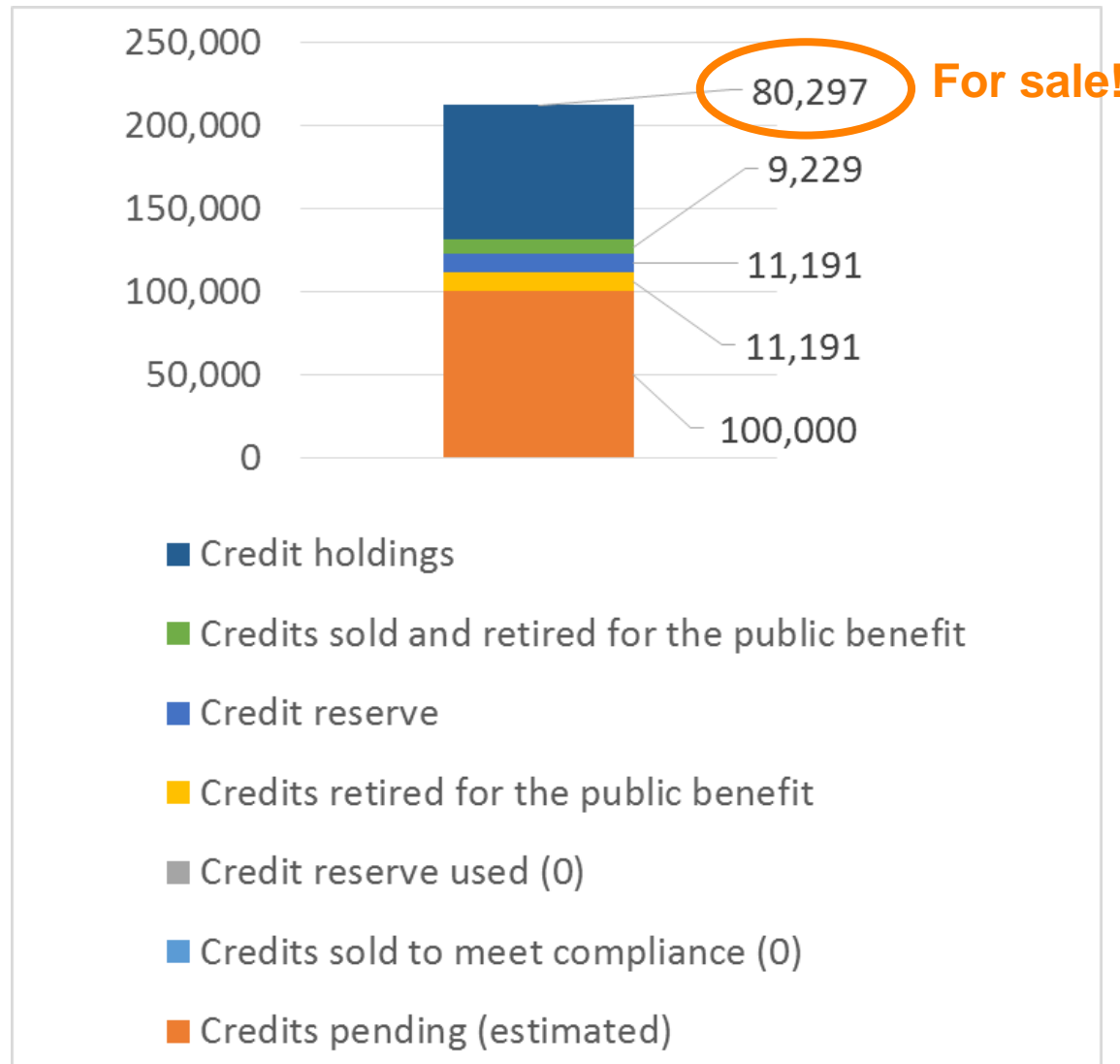


Overall Nutrient Reductions from First Phase of Pilot Trades



Overall Nutrient Reductions from First Phase of Pilot Trades

Pilot Trades (2013-2016)
33 projects



Overall Nutrient Reductions from First Phase of Pilot Trades

*What does 211,000 pounds
of nutrients look like?*

34
pallets
in this
photo



x 3!

The Next Phase of the Project For Forestry Planting and Quantifying Carbon Credits



Team:

American Farmland Trust; Coalition on Agricultural Greenhouse Gases (C-AGG); Delta Institute; Markit; EPRI; Troutman Sanders; University of California Santa Barbara; Michigan State University, Verified Carbon Standard, American Carbon Registry



FUNDING OPPORTUNITY NOTICE \$600,000

PRIVATE LANDOWNERS & PRODUCERS IN OHIO, INDIANA, AND KENTUCKY UNDER THE OHIO RIVER BASIN WATER QUALITY TRADING PROJECT

The Electric Power Research Institute (EPRI), American Farmland Trust and a team of collaborators have been working since 2012 with the support of the States of Ohio, Indiana, and Kentucky to install best management practices that generate “water quality credits” to achieve broader water quality improvements. 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 from landowners who have previously received funding.





Together...Shaping the Future of Electricity



<http://wqt.epri.com>

Jessica Fox / Becca Madsen
Sr. Program Manager / Technical Leader
650-855-2138 / 940-231-4359

jfox@epri.com / bmadsen@epri.com