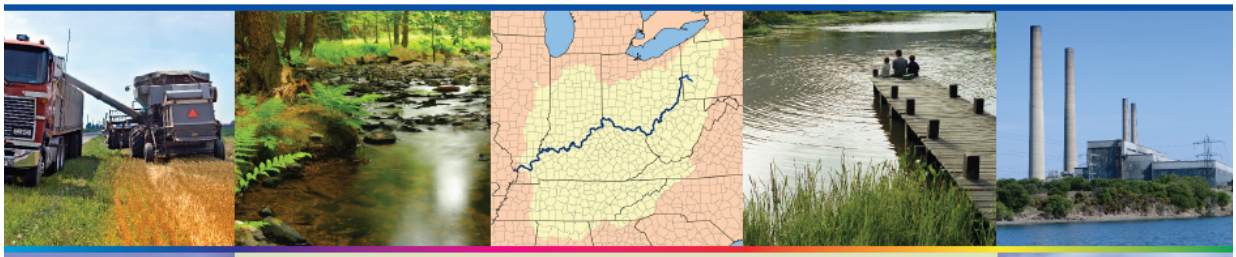
Meeting Summary

Briefing on EPRI's Ohio River Basin Water Quality Trading Project

April 29th, 2009 • Washington DC, EPRI Offices

Ohio River Basin Trading Project



An innovative approach to managing nitrogen and phosphorus pollution

You are cordially invited to attend a discussion on EPRI's Ohio River Basin Trading Project which will establish a regional program for trading water quality credits. This collaborative effort will include a large set of diverse stakeholders in the eight state project area, allowing power companies, farmers, and other industrial dischargers to work together to cost-effectively improve water quality. The program has the potential to benefit receiving water bodies that are now threatened by nitrogen and phosphorus pollution, such as the Gulf of Mexico.

At the meeting, EPRI's Jessica Fox will present a project overview and summary followed by comments from project collaborators. The discussion will be followed by a networking social for attendees. Due to the intimate nature of this event, please RSVP. To learn more about this trading project, visit our web page at www.epri.com/ohiorivertrading.

Date: Wednesday, April 29, 2009
Time: 3:00-5:30 PM EDT
Location: EPRI Washington Office
2000 L Street NW
Washington, DC 20036

Contact Jessica Fox at 1-650-855-2138 (jfox@epri.com) or Katie Vroom at 1-650-855-2838 (kavroom@epri.com) for more information.

ORSANCO · AEP American Electric Power · Miami Conservancy District · Hunton & Williams · Kieser & Associates Environmental Science & Engineering · American Farmland Trust Saving the Land that Sustains Us

Meeting Notes

Summary of comments from Project Collaborators:

- Alan Vicory, Executive Director ORSANCO

  ORSANCO is enthusiastically supporting EPRI's Ohio River Basin project and happy to be project collaborators. Being the interstate commission representing 8 states in the Ohio River Basin, ORSANCO brings an inherent culture of cooperation to the project. They have representatives from every regional EPA office relevant to the project and have been working collaboratively with point sources in the area for over 30 years. Earlier this year, ORSANCO commissioners identified water quality trading as one of several top priorities for exploration in the context of an expanded scope of services to its states. Compiling this with the fact that ORSANCO has regulatory power and are the conveners of the Gulf of Mexico Hypoxia task force, the organization is well positioned to support the EPRI efforts.
- Mark Kieser, Senior Scientist, Kieser & Associates

  This is an incredibly complex project that will need significant management in order to be implemented successfully. One of the top issues that needs to be resolved is defining the baselines from which credits can be generated.
- Ann Sorensen, America Farmland Trust

  AFT is very excited to be part of this project and sees many benefits to the farming community for participating in WQT. AFT will be critical for bringing farmers to the table from the beginning and is already engaging in listening sessions with farmers in the Ohio River Basin. Given AFT's success in engaging with farmers on the ground, they are very well positioned to support the EPRI effort to establish a large-scale water quality trading program.
- Brooks Smith, Hunton & Williams

  H&W is very happy to be part of this impressive effort. Especially noted at this meeting is the diverse group of attendees that have taken the time to learn about the project and offer comments. One of the key areas that needs focus will be to ensure that regulators are educated and supportive of the effort.
- Ali Saleh, developer of Nutrient Trading Tool

  We have collaborated with EPRI on a joint proposal to USDA to fund a demonstration of how NTT can be used in this project. We look forward to working with EPRI, and others around the country to broaden the use of NTT.

Main Points Discussed with Group:

- This project needs to coordinate with Chesapeake Bay Program (Glynn Rountree, (NAHB)
- Need to investigate the involvement of MS4's in the project (Glynn Rountree, NAHB)
- Need to determine baselines for trading (George Kelly, EBX)
- Establish plans for verification and monitoring to ensure credits are "real" (Jeremy Peters, NACD)
- The project is trying to do 3 big things: regional program, include NPS, and multi-state trading. If you only do PS-PS trading, the effort will be a success. Don't let the project parish in the effort to do everything. (Bob Rose, EPA)
- Need to coordinate with permit writers and educate EPA staff about project (Chris Lewicki, EPA).

Meeting Attendees

Alan Vicory	ORSANCO
Alex Beehler	Plexus Scientific
Ali Saleh, Ph.D.	Texas Institute for Applied Environmental Research (TIAER) Tarleton State University
Amelia Letnes	USEPA
Ann Sorensen	American Farmland Trust (AFT)
Bob Rose	US EPA
Brooks Smith	Hunton & Williams LLP
Chris Lewicki	US EPA, Office of Wetlands, Oceans and Watersheds
Dan	
Dan Nees	Forest Trends
Daniel Spethmann, Ph.D.	Working Lands Investment Partners, LLC.
Dave Bailey	Electric Power Research Institute (EPRI)
Eladio Knipping	Electric Power Research Institute (EPRI)
George Kelly	Environmental Banc & Exchange, LLC
Glynn Rountree	National Association of Home Builders
James Daukas	AFT
Jennifer Morrill	American Farmland Trust (AFT)
Jeremy Peters	National Association of Conservation Districts
Jessica Fox	Electric Power Research Institute (EPRI)
Jim	Environmental Law Institute
Mark Kieser	Kieser & Associates, LLC
Mary Ray	American Farmland Trust (AFT)
Moira	WFF
Steve Dye	ORSANCO Council
Timm Kroeger	Defenders of Wildlife
Tom Simpson, Ph.D.	Water Stewardship, Inc
Tracy Mehan	The Cadmus Group, Inc.
Tracy Stanton	Forest Trends/Ecosystem Marketplace

Project Contact:

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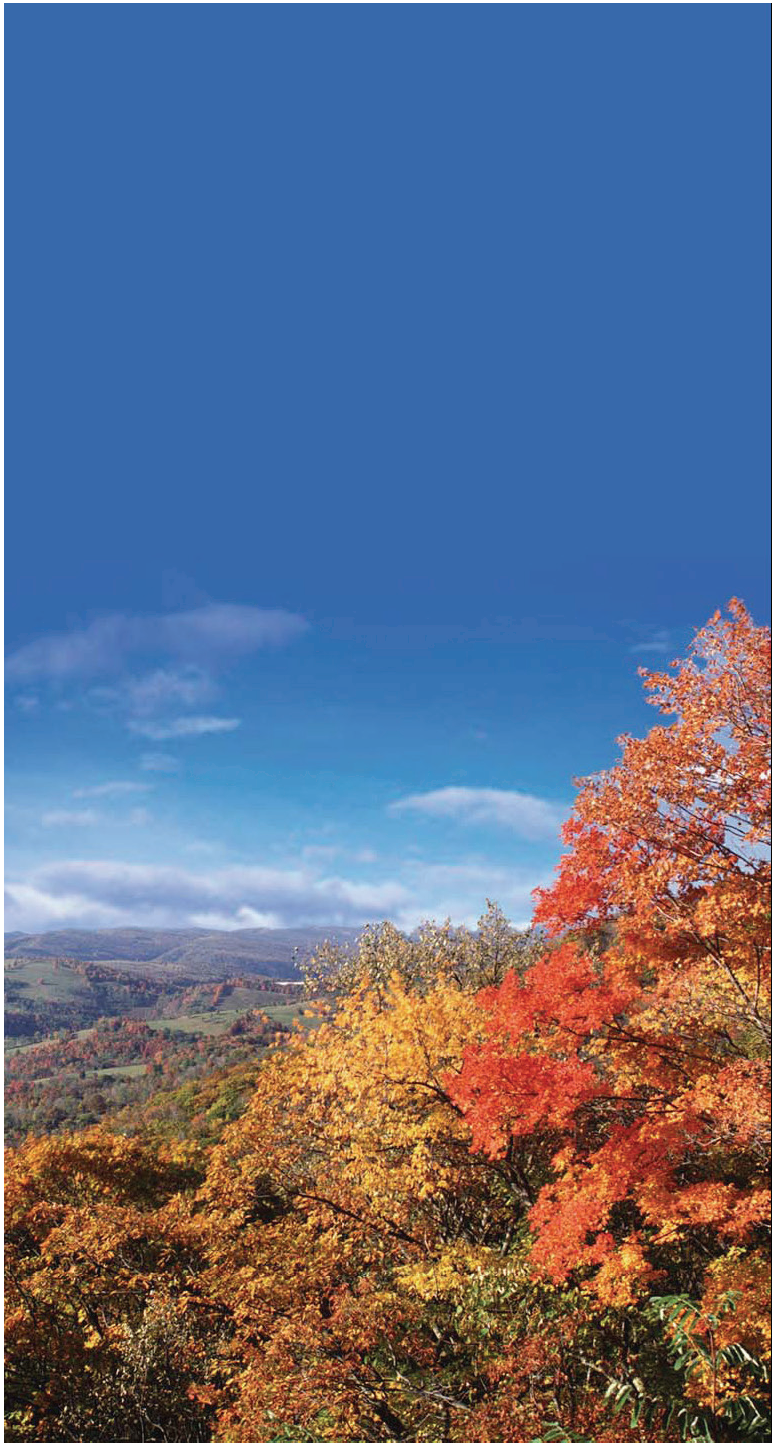
Email: JFox@epri.com
Project e-mail: ohiorivertrading@epri.com
www.epri.com/ohiorivertrading

EPRI intends to support a collaborative process for the development of this project. To this end, we accept feedback, questions, and suggestions on a rolling basis. Please feel free to send us input via e-mail.



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Water Quality Trading in the Ohio River Basin:

Summary and Discussion

April 29th , 2009
Washington, D.C.

Jessica Fox
Project Manager

Agenda

- Project Summary
- Comments from Collaborators
- Discussion & Questions
- Refreshments & Social

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Project Collaboration

Electric Power Research Institute

Kieser & Associates

Ohio River Valley Water Sanitation Commission (ORSANCO)

American Electric Power

Duke Energy

American Farmland Trust

Miami Conservancy District

UC Santa Barbara

Hunton & Williams

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PBS Special Report - April 2009

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Highlights: Poisoned Waters

- More than three decades after the Clean Water Act, iconic American waterways like the Chesapeake Bay and Puget Sound are in perilous condition and facing new sources of contamination.
- The USGS research on the Potomac River poses some troubling questions for the 2 million people who rely on the Washington Aqueduct for their drinking water.
- "The irony is that everybody looks at that [picturesque] scene and thinks that it's great. But in point of fact, not 100 feet away from where they are drinking a nice glass of wine off their white linen, there is this unbelievable gunk coming out of the end of this pipe."

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Drainage into Gulf of Mexico

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Groups Urge Action in Gulf of Mexico

"Environmental groups and scientists have issued a call for President Barack Obama and Congress to take immediate steps to reduce the dead zone in the Gulf of Mexico."

"Supporters say a systematic approach is critical to better understanding and managing the water pollution across the 31-state Mississippi and Ohio River basins."

- April 22, 2009 Houma Today, Louisiana

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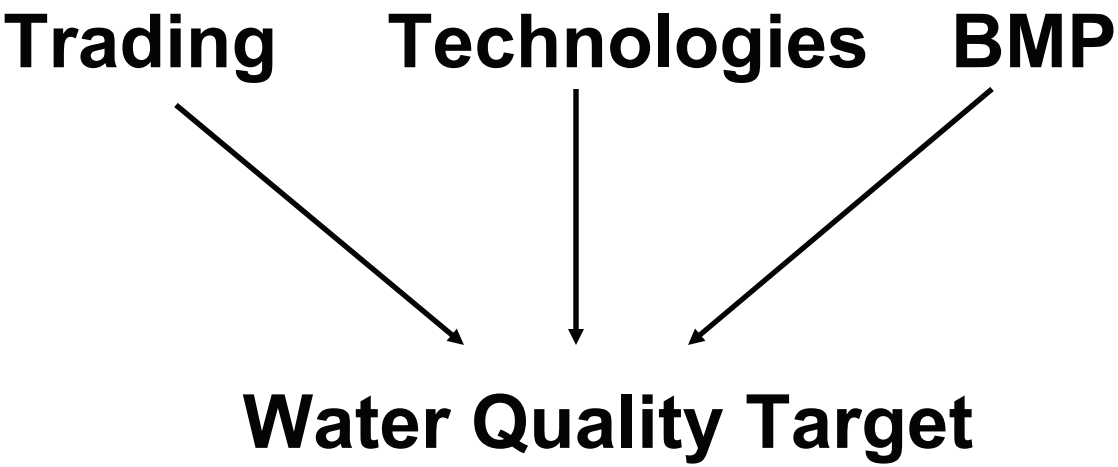
Meeting Water Quality Targets



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EPRI's Interest in WQT

- EPRI wants to establish a project where power companies will participate as buyers and/or sellers of nitrogen credits.
- Such a project will allow power companies manage their nitrogen discharge with WQT.
- Project will serve as a model for other trading programs in the U.S.

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Project Origin: EPRI WQT Focus Group

Began November 2005

- Tennessee Valley Authority
- Southern Company
- Minnesota Power
- Hoosier
- Duke Energy
- American Electric Power

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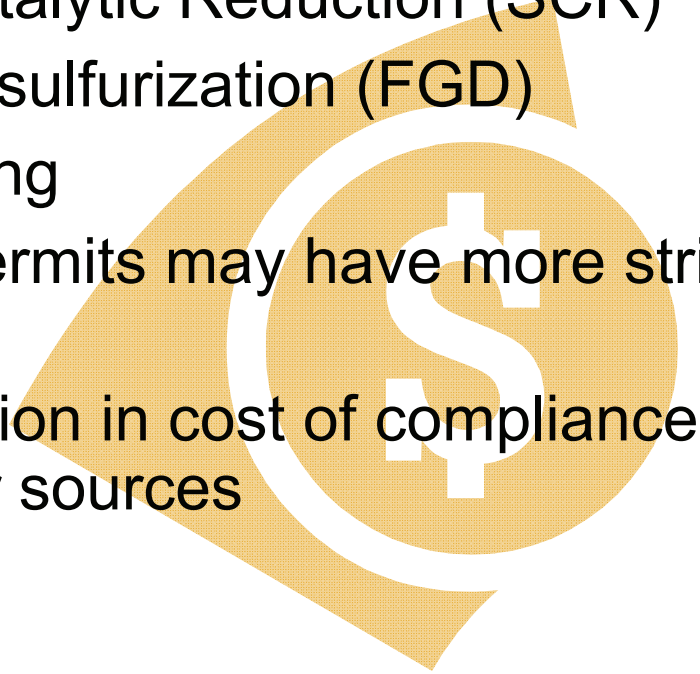
Rationale

- N load from power plants may increase in near future
  - Selective Catalytic Reduction (SCR)
  - Flue Gas Desulfurization (FGD)
  - NOx scrubbing
- New NPDES permits may have more stringent limits on N discharges
- Potential reduction in cost of compliance by trading N & P loads with other sources



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Nitrogen in Power Plants

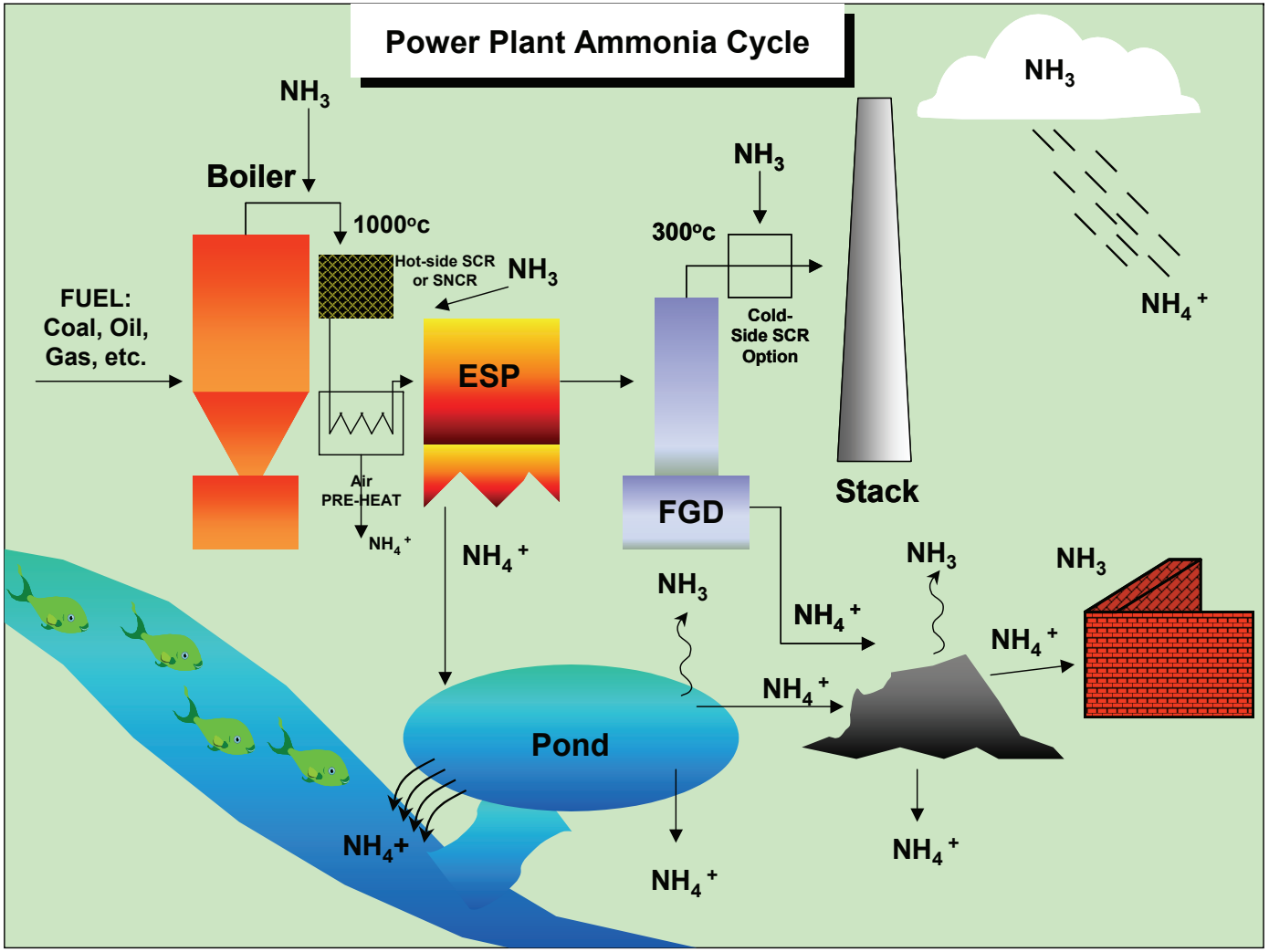

Figure 1—Power Plant Ammonia Slip Pathways

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Characteristics of Successful Water Quality Trading Programs

- Approximately 80 WQT pilot projects, feasibility assessments, and trading programs have been conducted throughout the U.S. in the last 15 years.
- Few have resulted in actual trades.
- These projects, assessments, and programs provide lessons regarding characteristics that may promote or hinder success of WQT.

Appendix A: EPRI Report 1014646, August 06

Shaw™ Shaw Environmental, Inc.

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Considered WQT Pilot Programs

- Ohio River Basin
- Chesapeake Bay
- Catawba River Basin

Options presented to EPRI Advisors,

June 2007

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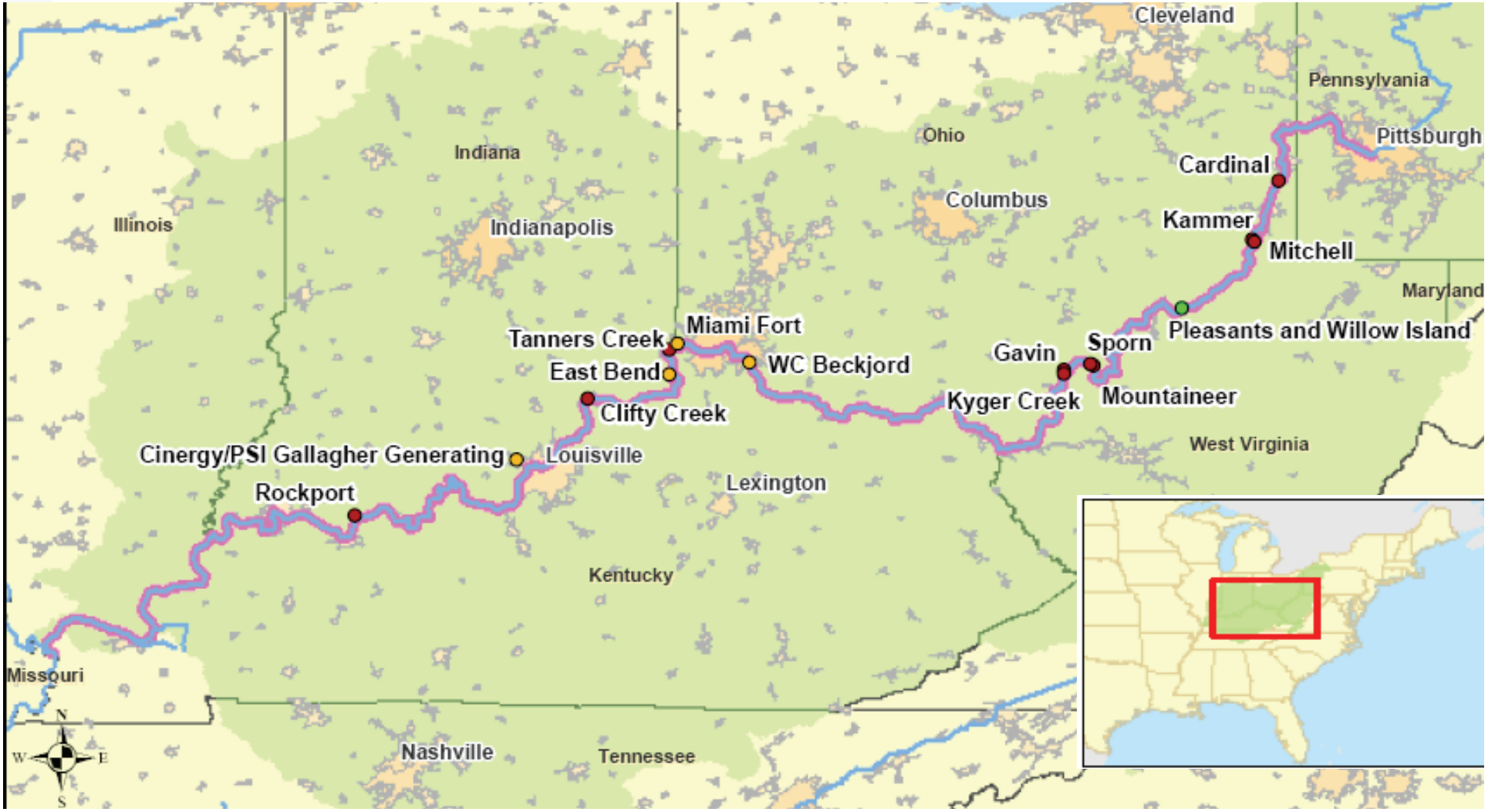
Screening Criteria	Ohio River	Chesapeake Bay	Catawba River Basin
Pollution cap - measurable and restrictive	●	●	◖
Type	●	●	◖
Timing	●	●	●
Nutrient discharge regulations	●	●	◖
Nitrogen	●	●	◖
Phosphorus	●	●	●
Permitting cycle	●	◖	●
High Compliance Costs	●	●	●
High variability in pollution control costs	●	◖	●
PS - Facilities with high impending treatment costs	●	●	●
NPS – Reduction costs	●	◖	◖
Basis for strong credit supply and demand	●	◖	◖
Baseline for PS and NPS (% reduction for all sources)	●	●	○
Industry mix	●	◖	●
Seed funding (multiple potential funding sources)	●	◖	●
Program champion	●	○	●
Lead identified	●	○	●
Supporting organizations identified	●	◖	◖
Conducive regulatory environment	●	◖	◖
Interstate Coordination	●	◖	◖
Organizations	●	◖	●
Regulatory authority	●	○	◖
Stakeholder Willingness	●	◖	◖
Buyers	◖	◖	◖
Sellers	●	◖	◖
Public	◖	●	◖
Methods for calculating pollutant equivalency	◖	●	◖
Modeling for load allocations	◖	●	◖
Modeling	●	●	◖
WQ Data	●	●	●

EPRI Report: Water Quality Trading Programs Pilot Project Review. Prepared By Shaw Environmental

Project Area



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Ohio River Basin Chosen

- High nutrient loading
- Pending regulatory program will create potential
- WQT credit demand
- Presence of multiple sources of N & P
- Regulatory climate favorable to WQT
- Presence of numerous coal-fired power plants with potential or actual N loads
- Many stakeholders: Farmers, WWTP, Power Industry
- Links to Gulf of Mexico Hypoxia issues

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Ohio River Trading Program Goals

- Participants will achieve cost-effective outcomes
- Add WQT trading to the toolbox of large set of stakeholders
- Ecosystem Service Benefits
- Regional Effort
- Collaborative process
- 3-5 years to established program (trading in 1-2 yrs)

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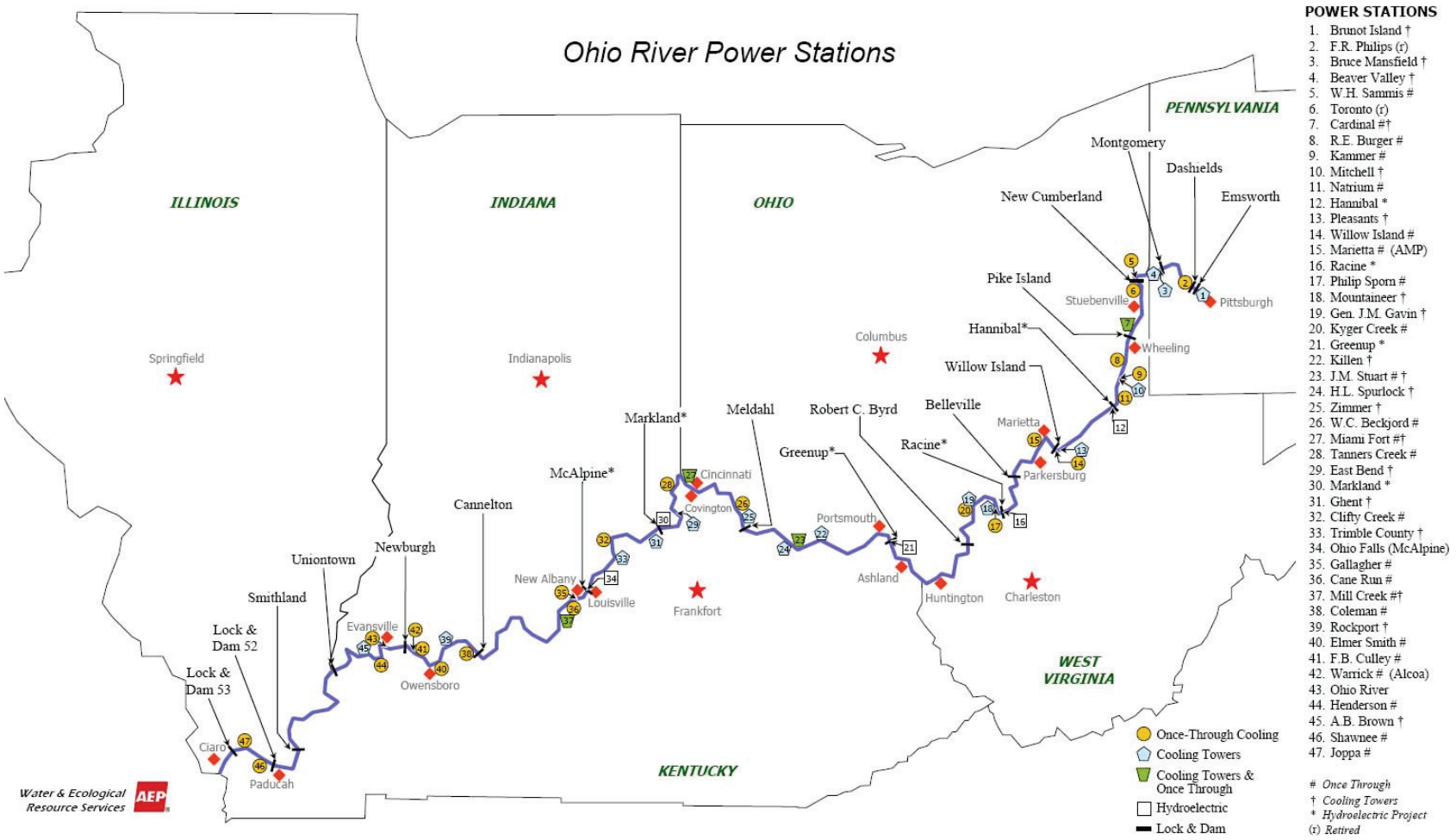
Ohio Basin Power Plants



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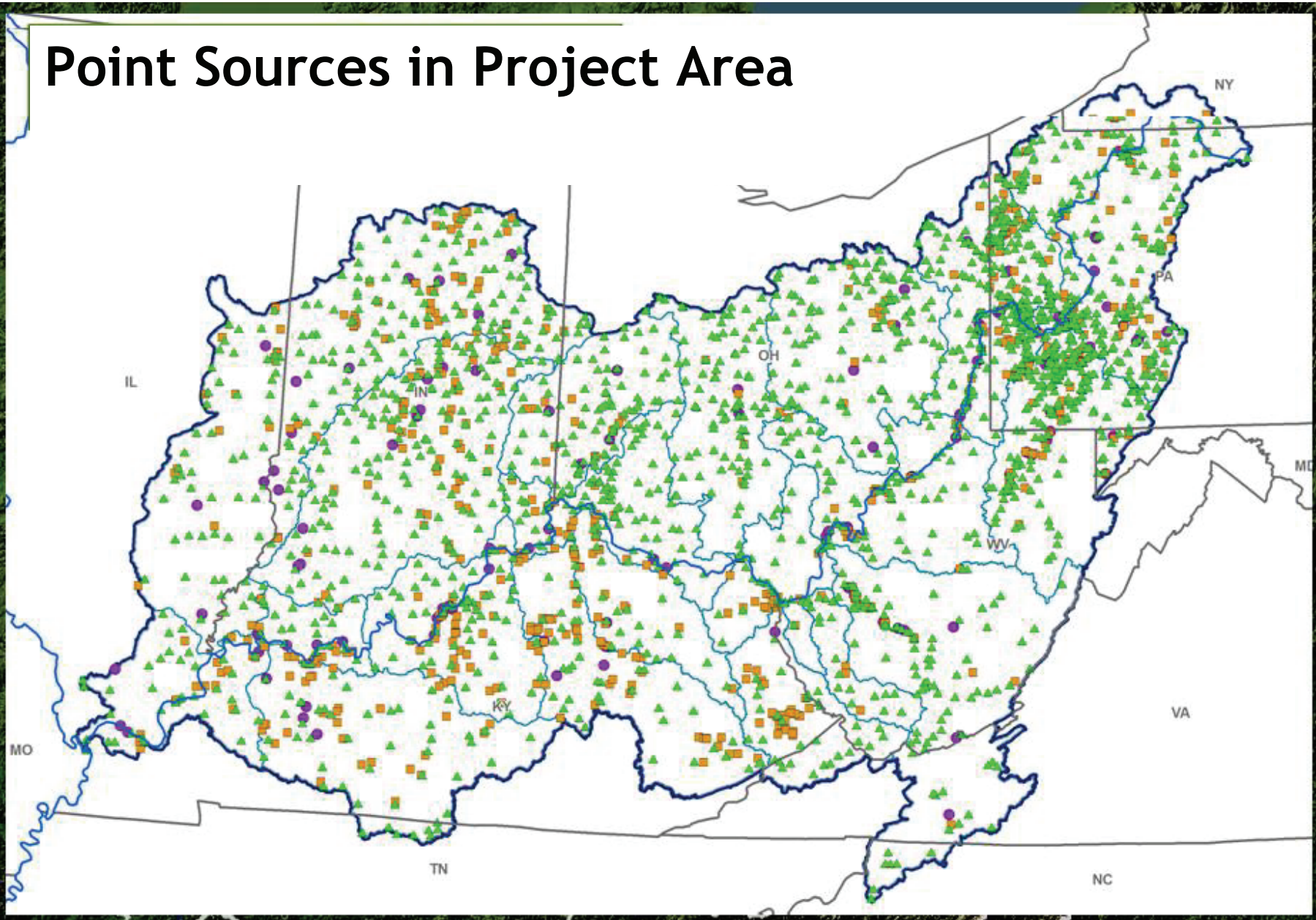
Point Sources in Project Area



14 states >200,000 mi² 116 Power Plants 539 Industrial facilities 1911 POTWs

Source: EPA BASINS

Provided by Kieser & Associates

Trading Types

- **Point/Point** - Point source pays another point source for reduction credits
- **Point/Nonpoint** - Permitted and non-permitted sources with voluntary (market driven) credit generation
- **Non-point/nonpoint** - Regulated nonpoint source such as municipal storm water permittees and unregulated nonpoint sources such as agriculture

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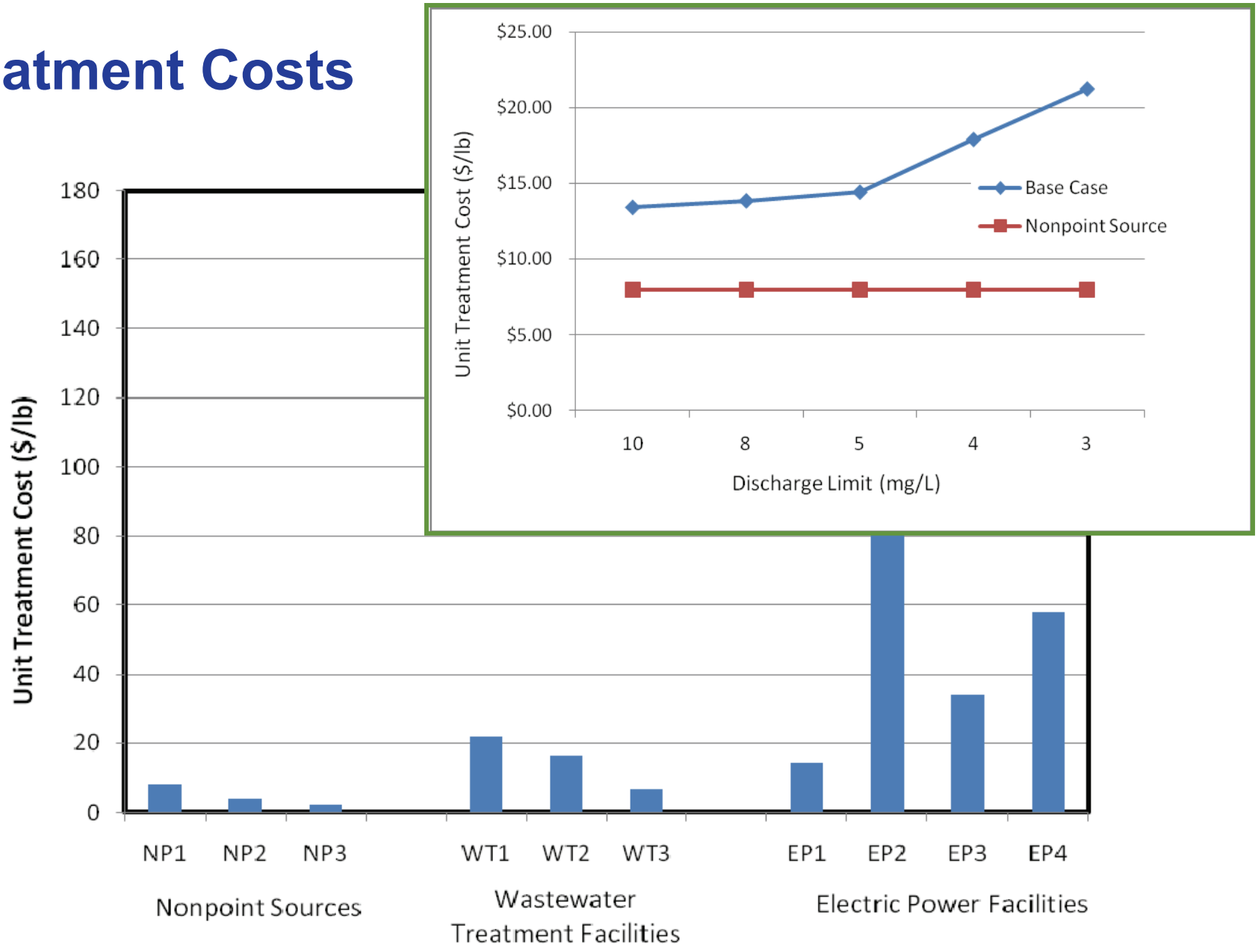
Treatment Costs



Source: EPRI Business Case, Prepared by Shaw Environmental and Kieser & Associates

Ecological Foundations

Project is committed to using available science to inform the structure of the trading program to improve ecological outcomes.

There will be compromises across social, economic, and ecological elements.

Goal is to understand how these compromises will affect in-stream concentrations of nutrients and, when possible, assess impacts to broader ecological elements.

Scenario: having a credit trading ratio of 2:1 instead of 3:1 will result in an additional xx pounds of nitrogen into a particular segment of water.

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Watershed Modeling

Watershed Analysis Risk Management Framework (WARMF)

Dr. Arturo A. Keller, Ph.D.

Bren School of Environmental Science & Management

University of California, Santa Barbara

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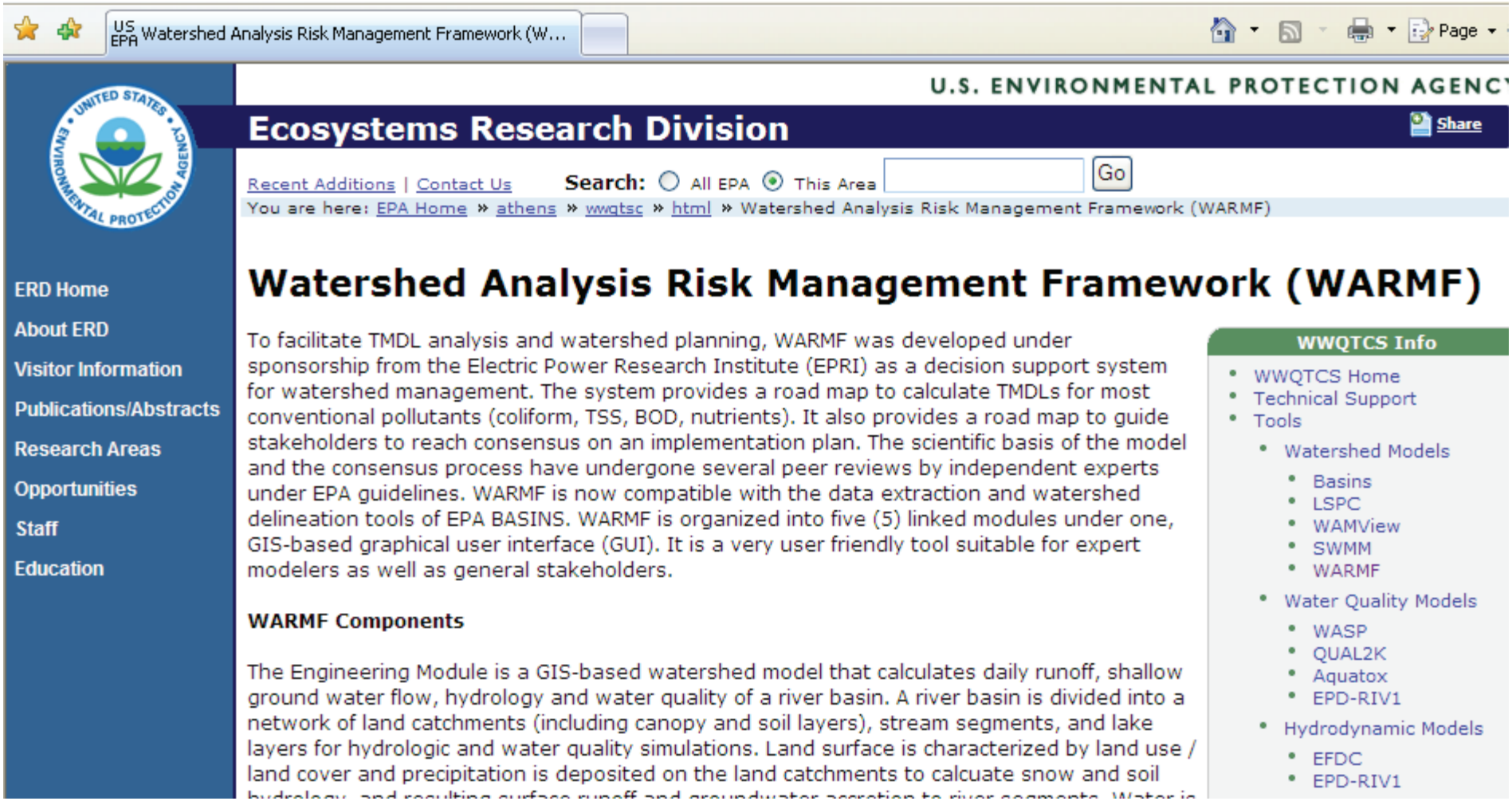
Download WARMF from EPA



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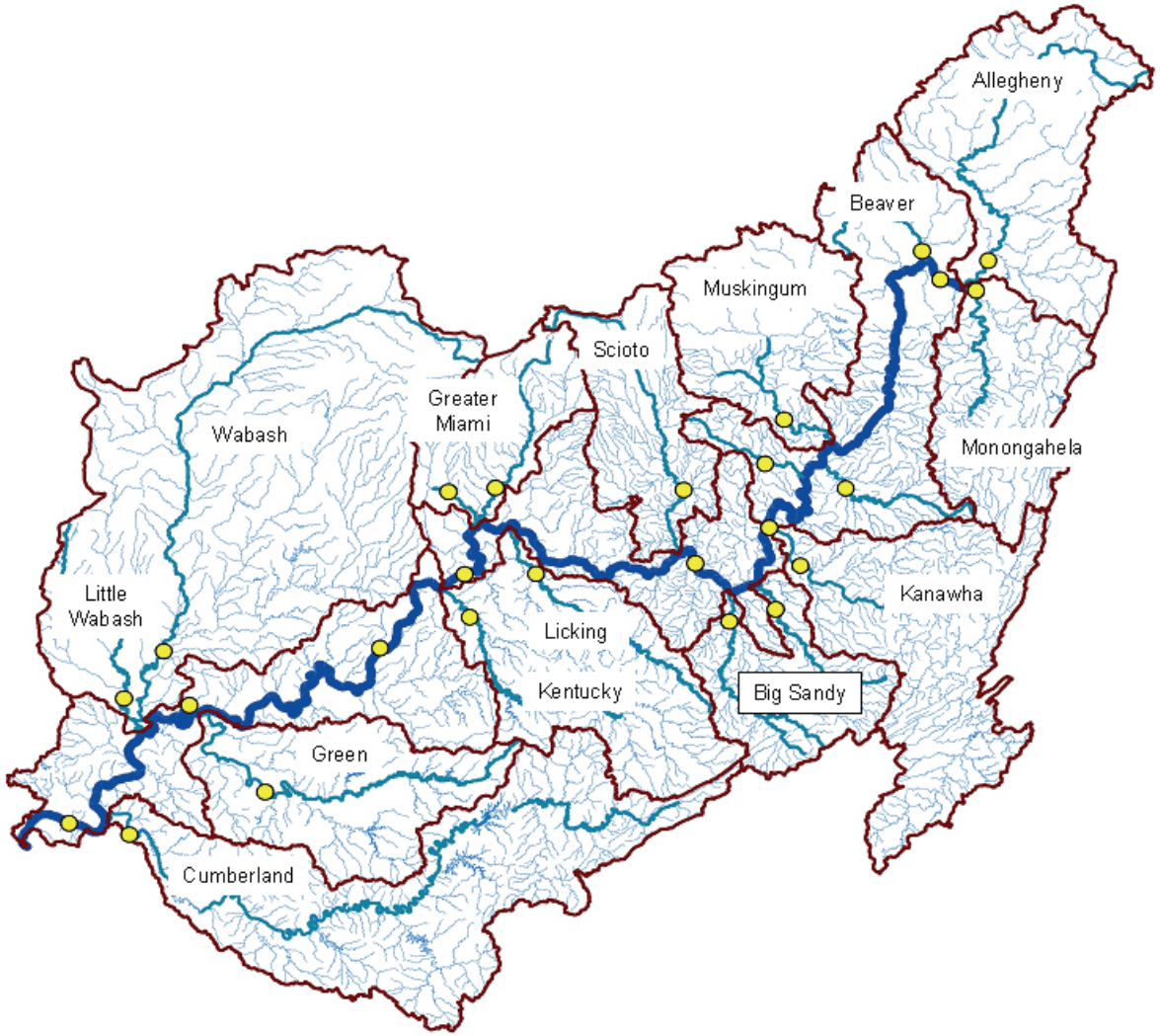
Applying WARMF to Ohio River Basin



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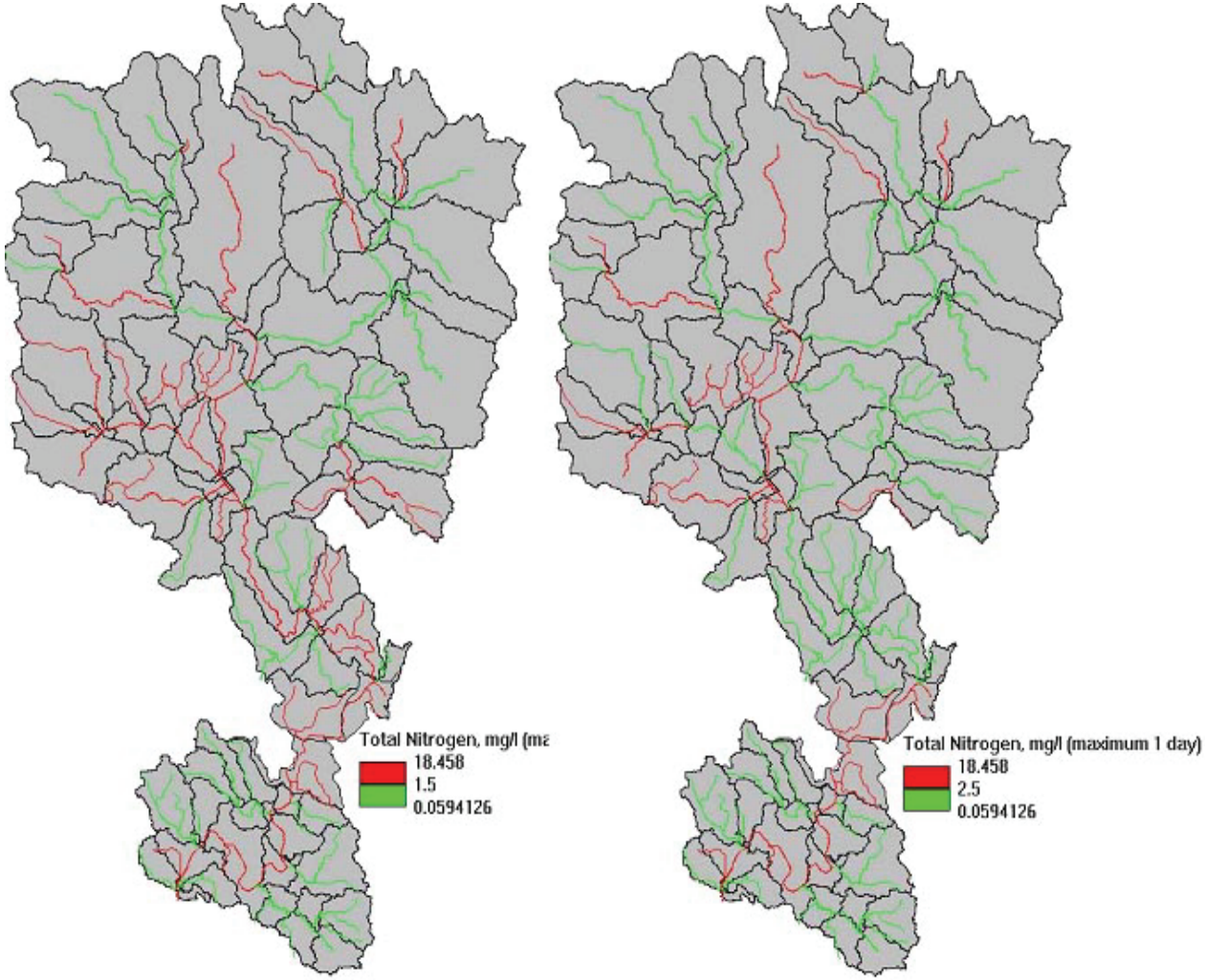
Total Nitrogen Areas with Potential



Reference level = **1.5 mg/L** **2.5 mg/L**

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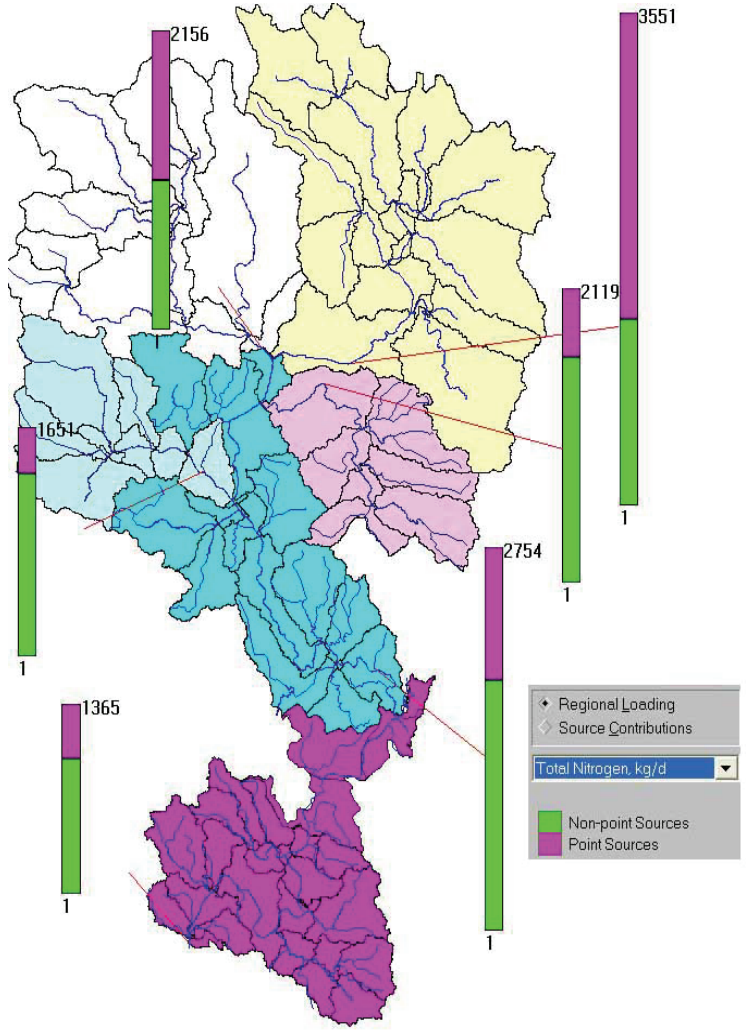
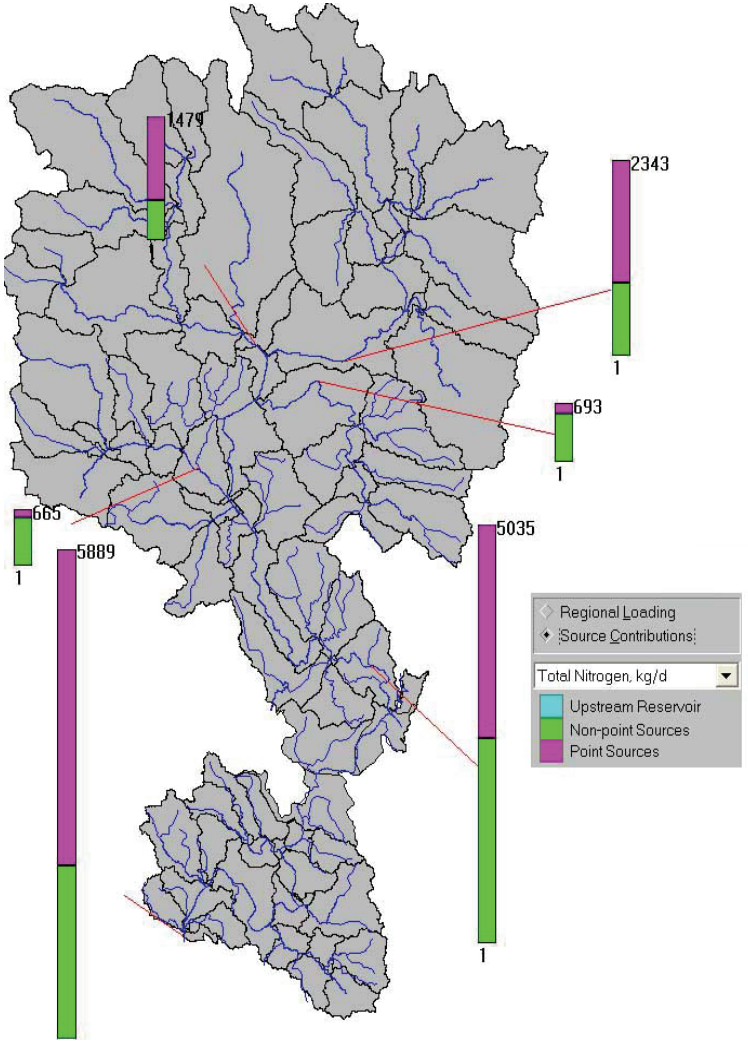
TN Load





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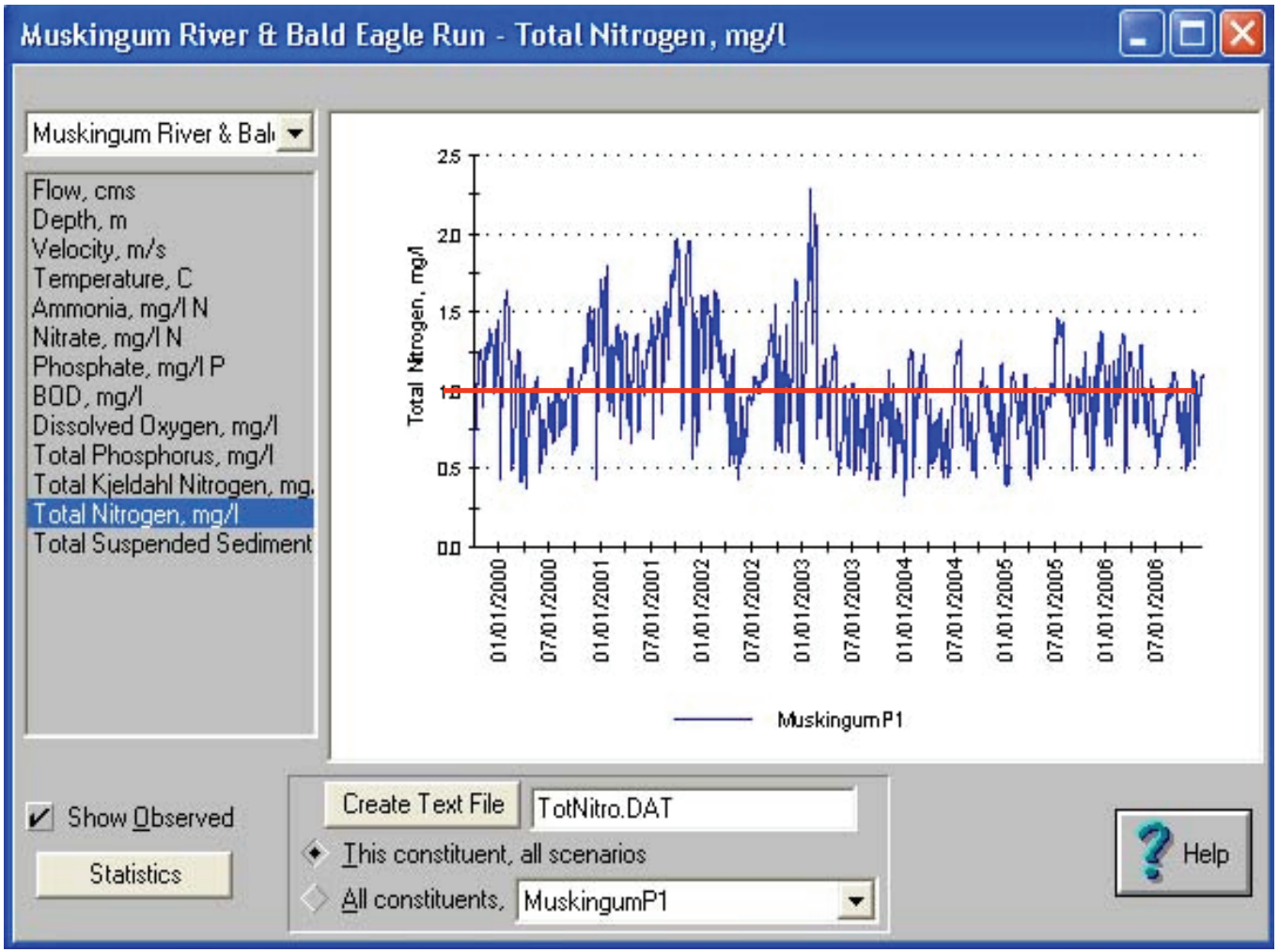
Temporal Pattern of WQ Exceedance



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Types of Analyses

- Modeling nutrient fate and transport within the basin
- Evaluating effectiveness of BMPs at different scales
- Studying the effects of specific nutrient trades
- Evaluating different “what if” scenarios that the stakeholders would like to try
- Informs key technical questions (trading ratios, discounting)
- Helps to evaluate potential ecological benefits of trading programs
- Helps to develop and inform a water quality monitoring program

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Investigating Credit Stacking with GHGs

Adam Diamant, EPRI Global Climate Program

Demonstrating the potential to achieve large scale, cost-effective GHG emissions offsets by reducing N2O emissions from agricultural crop production.

EPRI developed this project in collaboration with one of the world's foremost experts on non-CO2 GHG emissions from agriculture – Dr. Phil Robertson, Professor of Crop and Soil Sciences at Michigan State University (MSU).

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Benefits of Regional WQT Program

- Save millions $s in future start-up and program costs (compared to many small, localized trading programs)
- Allow PSs with multiple discharges to manage compliance needs under one primary trading framework
- Incentivize non-point source load reductions
- Provide uniformity in credit calculations across basin
- Legal framework for interstate trading
- Support nutrient standards development with modeling applications and flexible compliance tools
- Centralize trading debate/program design efforts to facilitate multi-state communication
- *Flexible, cost-effective compliance options with greater net environmental benefits*

KIESER & ASSOCIATES
ENVIRONMENTAL SCIENCE & ENGINEERING

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Project Summary

- Due to the large set of stakeholders in the project area, this effort will allow **power companies, farmers, and other industrial dischargers** to work together to improve water quality, minimizing costs to the public.

- This project will be a regional multi-credit trading program and represents a comprehensive approach to designing and developing markets for **nitrogen, phosphorus and potentially GHG credits**.

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Funding to Date

EPRI Technology Innovation Program

Investment of $700,000 since 2005 to identify, investigate and develop opportunities in WQT.

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Future Funding

- EPA Targeted Watersheds Grant, Contracting, $1M
- Conservation Innovation Grant USDA Grant - $300K
- EPRI Supplemental Project, seeking $500K
- Foundation funding

Seeking approximately $5M for full project implementation.

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Supplemental Project (1018855)

- Organization and Facilitation of Stakeholder Group
- Support Trading Program Design
- Continue Watershed Modeling (WARMF)
- Evaluation of Credit Stacking with Carbon and Water quality credits

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Ohio River Basin Trading Program for Water Quality and Greenhouse Gases

Ohio River Basin Project Area. Water quality trading offers Ohio River power companies opportunities to meet discharge limits, reduce emissions and protect watersheds at lower costs.

- Cost-effective option for reducing nitrogen discharges and greenhouse gas emissions
- Innovative approach to "stack" carbon and nitrogen credits
- Rigorous, ecologically based trading program design that unravels local/regional regulatory and stakeholder complexities
- Framework for long-term water quality management in the Ohio River Basin
- Implications for improvements in the Gulf of Mexico hypoxic zone
- Early experience understanding the role of trading in future company compliance strategies and business planning

Water quality trading is an innovative market-based approach to achieving water quality standards through programs that allow emitters to purchase pollution reductions from another source. Control costs for any one pollutant can differ from one emitter to another, and water quality trading provides an option for meeting pollution permit targets in a cost-effective manner. Similarly, carbon credit markets enable the most cost-effective solution for meeting anticipated carbon caps. Properly designed and deployed, the proposed trading program in the Ohio River Basin will produce both greenhouse gas (GHG) and water quality credits, protecting watersheds at lower overall costs.

demonstration of a wide-scale, multi-pollutant approach enhances the value above a single pollutant credit market.

This work is timely as existing challenges to meet nutrient discharge limits may be amplified by increased effluent discharges of nitrogen (due to operation of air pollution controls), coupled with more stringent water quality based limits for surface waters.

Drivers and Trends

EPRI recently completed a feasibility analysis for multistate

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Project Website
www.epri.com/ohiorivertrading

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Overview | Ohio River Basin Trading Pilot Project

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Water and Ecosystems Research

>> Water and Ecosystems

2009 Research Offerings

>> View the 2009 Water and Ecosystems Research Portfolio

2008 Research Summaries

>> Water Quality Criteria Development and Assessment - Program 53 (110KB PDF)

Ohio River Basin Trading Pilot Project

Control costs for any one pollutant can differ from one emitter to another. Water quality trading (WQT) is an innovative market-based approach to achieving water quality standards that allows emitters to purchase pollution reductions from another source. A trading program enables facilities facing high pollution control costs to buy reductions from another facility with lower pollution control costs. The net effect is the same water quality improvements at lower, more efficient costs. Today, a few states have trading frameworks in place or in development but none operate on an interstate or regional basis. EPRI recently completed a feasibility study for a regional water quality trading program in the Ohio River Basin and is currently working with stakeholders and trading partners to develop a working pilot project. EPRI leads this effort with support from Kieser & Associates, LLC, American Farmland Trust

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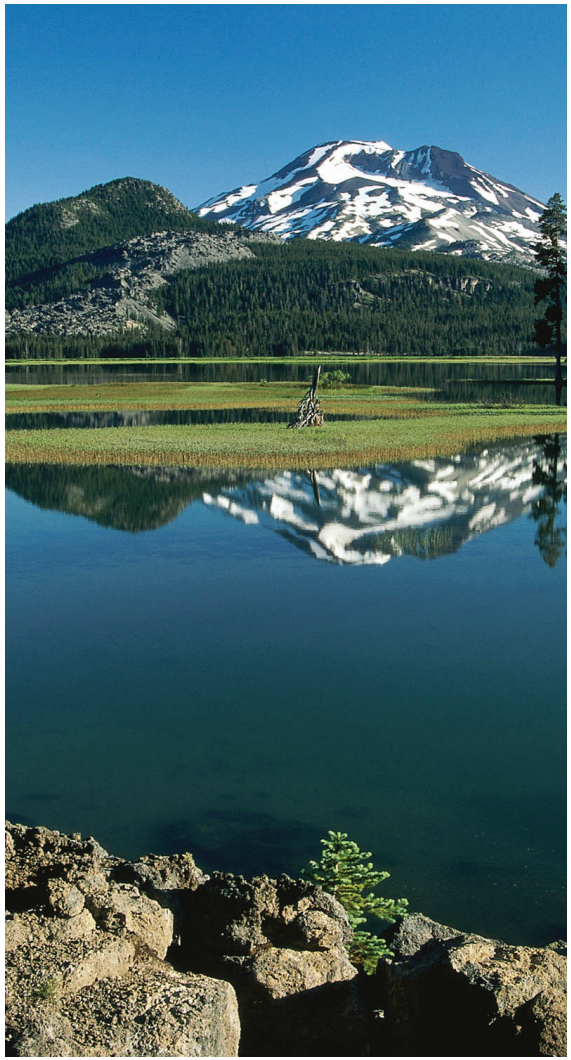
Comments from Collaborators



Mark Kieser, Kieser & Associates

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Ann Sorensen, American Farmland Trust

Brooks Smith, Hunton & Williams

Ali Saleh, Nutrient Trading Tool

Not Present Today:

American Electric Power

Duke Energy

Miami Conservancy District

Dr. Arturo Keller, UC Santa Barbara

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Questions & Answers

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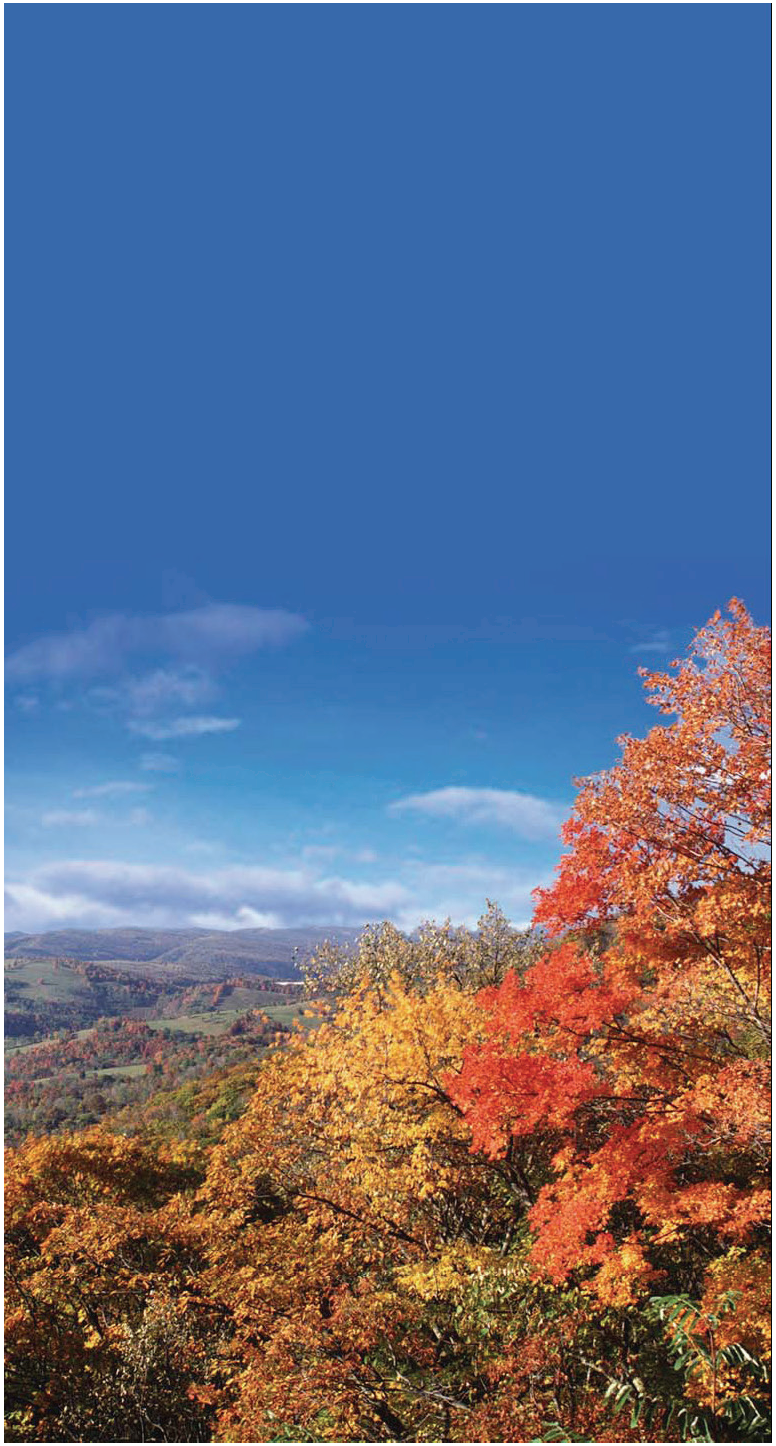

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