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April 27, 2015

SARA WALKER



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WRI WORKS AT THE INTERSECTION OF PEOPLE AND THE ENVIRONMENT

PHOTO: N. SIGTIA FLIKR/GGIAR CLIMATE

WRI'S STRENGTHS

- Finding innovative, cost-effective solutions
- Visualizing data
- Convening stakeholders & engaging the private sector

OVERCOMING BARRIERS TO TARGETING RESOURCES



Working Paper

IMPROVING WATER QUALITY: A REVIEW OF THE MISSISSIPPI RIVER BASIN HEALTHY WATERSHEDS INITIATIVE (MRBI) TO TARGET U.S. FARM CONSERVATION FUNDS

MICHELLE PEREZ AND SARA WALKER

SUMMARY

Historically, federal conservation programs have focused on solving environmental and natural resource problems on individual farms. While improvements have been made in water quality and wildlife habitat at the farm scale, landscape-scale environmental benefits in streams, lakes, and bays, for example, are less commonly documented. Excess nutrients (nitrogen, N, and phosphorus, P) continue to impair thousands of waterways, and eutrophication leads to hypoxia (low oxygen levels that harm aquatic life) or dead zones in water bodies around the country.

Currently, approximately 10 percent of the U.S. Department of Agriculture's (USDA) Natural Resource Conservation Service's (NRCS) conservation budget is spent on targeting conservation efforts in high priority areas to achieve environmental outcomes at the landscape scale (i.e., across a geographic region facing similar water quality issues such as a watershed). However, focusing more conservation efforts in this manner, as opposed to the predominant approach, which disperses rather than concentrates funds across farms in each state, has the potential to achieve greater environmental improvements per dollar spent. In 2009, NRCS launched the Landscape Conservation Initiatives to more effectively address priority environmental and natural resource concerns by focusing on the most important geographic areas. These initiatives hold great promise for cost-effectively achieving significant outcomes at the landscape scale.

The World Resources Institute (WRI) reviewed the Mississippi River Basin Healthy Watersheds Initiative (MRBI), one of NRCS's largest water quality-focused Landscape

CONTENTS

Summary	1
Introduction	3
Background	5
Methods	6
Findings and Discussion	8
Conclusion and Recommendations	24
Endnotes	30
References	32
Appendix: Assessment Factors, Criteria, and Ratings	34

Disclaimers: Working Papers contain preliminary research, analysis, findings, and recommendations. They are circulated to stimulate timely discussion and critical feedback and to influence ongoing debate on emerging issues. Most working papers are eventually published in another form and their content may be revised.

Suggested Citation: Perez, Michelle, and Sara Walker. 2014. "Improving Water Quality: A Review of the Mississippi River Basin Healthy Watersheds Initiative (MRBI) To Target U.S. Farm Conservation Funds." Working Paper. Washington, DC: World Resources Institute. Available online at: wri.org/publications/040201



ISSUE BRIEF

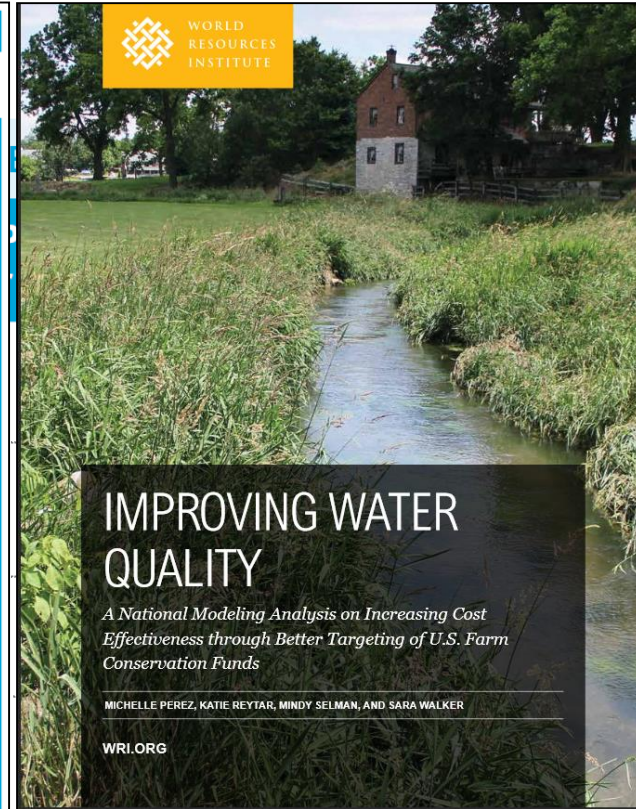
IMPROVING WATER QUALITY: OVERCOMING BARRIERS TO BETTER TARGETING OF U.S. FARM CONSERVATION FUNDS

SARA WALKER AND MICHELLE PEREZ

SUMMARY

The U.S. Department of Agriculture (USDA) spends more than \$5 billion annually on agricultural conservation programs. However, these payments have traditionally only focused on farm-scale environmental problems instead of also solving landscape-scale problems such as waterbodies impaired by excessive nutrients from agriculture. In addition, the funds have not been allocated as cost effectively as possible. Targeting—identifying high priority land, such as regions or watersheds, for implementing conservation and within those areas, selecting specific acres and practices that are cost effective—can be used to achieve landscape-scale conservation goals and to ensure that environmental benefits are maximized per federal conservation dollar spent. Because targeting is not prevalent within USDA's programs, this paper identifies the scientific and technical, social and political, and institutional and implementation barriers to targeting as well as options for USDA and other agencies and organizations to consider for overcoming these barriers.

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IMPROVING WATER QUALITY

A National Modeling Analysis on Increasing Cost Effectiveness through Better Targeting of U.S. Farm Conservation Funds

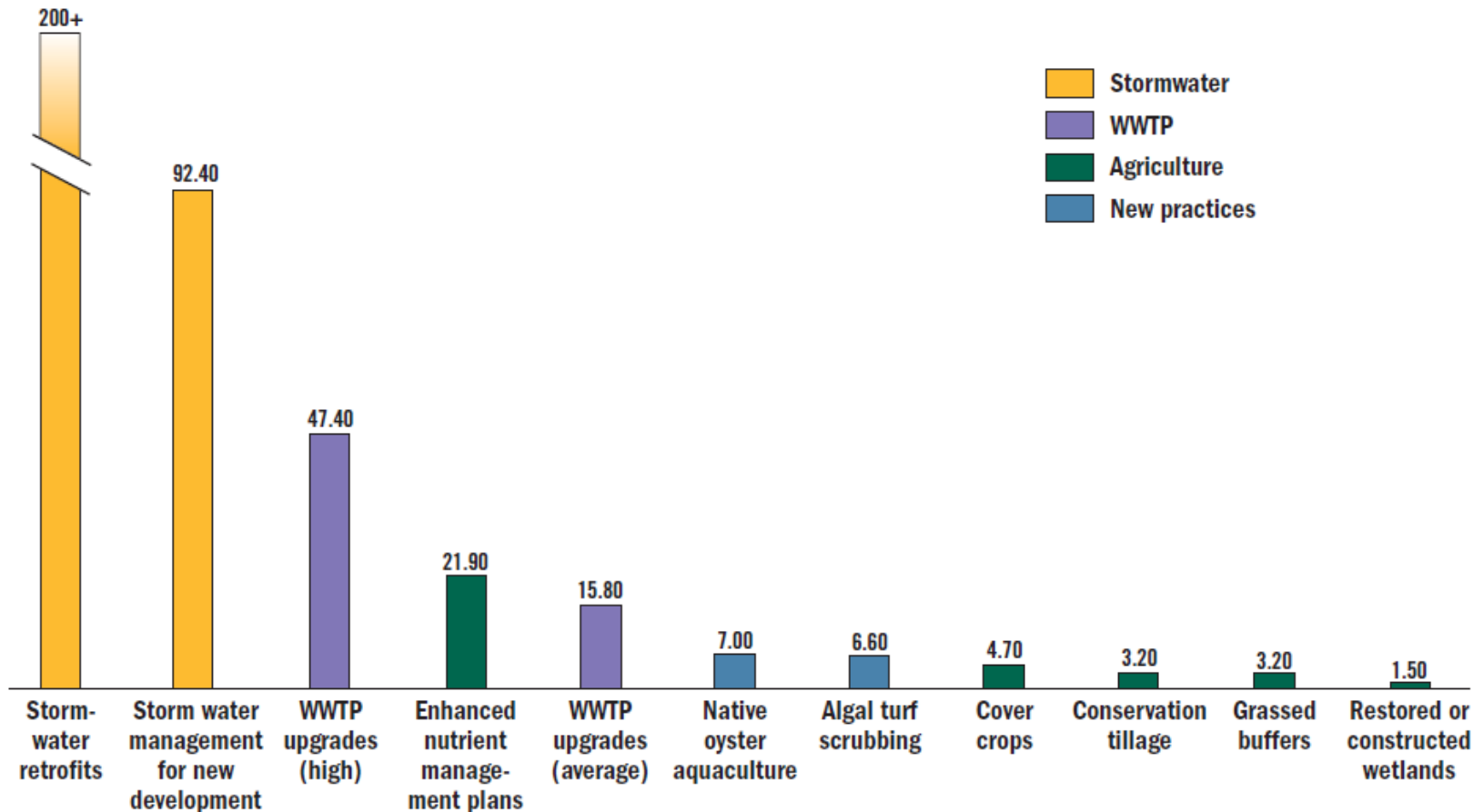
MICHELLE PEREZ, KATIE REYTAG, MINDY SELMAN, AND SARA WALKER

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COMPARING COSTS OF NITROGEN REDUCTION MEASURES

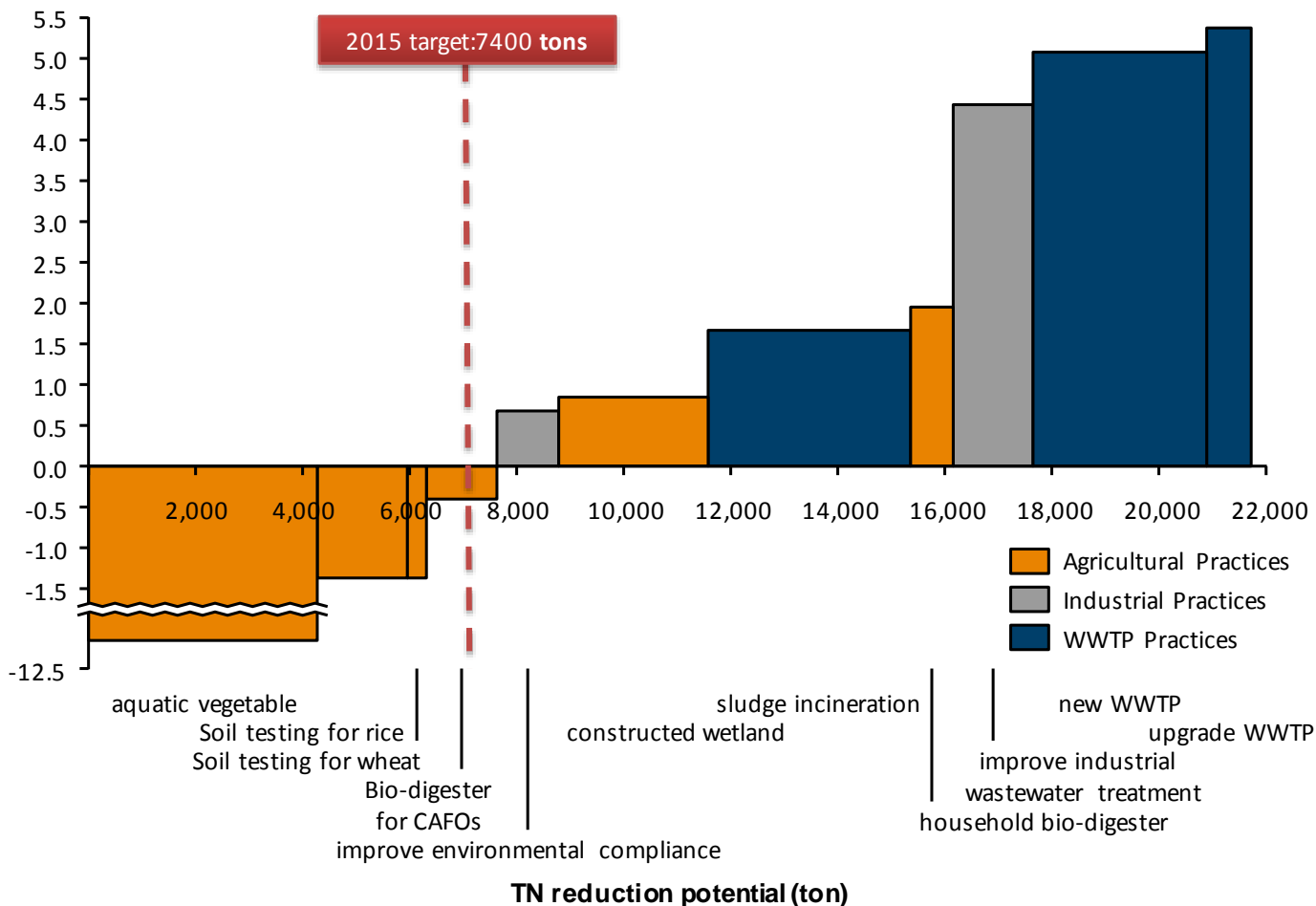
Nitrogen reduction costs differ among sectors, creating economic opportunities for trading

Dollars per pound of annual nitrogen reduction



ANALYZING POLLUTION REDUCTION OPPORTUNITIES

Unit cost for TN removal
(10,000 CNY/ton)



MODELING FIELD-SCALE NUTRIENT LOSSES

AGRICULTURAL PROJECT WORKSHEETS

Home » Farms » Demo Farm » Edit Location

Summary Edit Details Edit Location Fields Review Submit



Map Navigation

Use the map navigation controls or county and ZIP code lists below to find your area.

Zoom to a County:

Zoom to a ZIP Code:

Farm Field Tools

To add a new parcel or field, click the **New** button to enter field name and then click on the map to draw the parcel or field boundary.

To edit a parcel or field, first select it using the **Editing Options**. Then drag the vertices to edit the boundary.

Click the **Submit** button to start your nutrient credit calculation.

Editing Options:

NITROGEN

Baseline Load (EOS): 272.84 lb (13.64 lb/ac)

Current Load (EOS): 335.46 lb (16.77 lb/ac)

PHOSPHORUS

Baseline Load (EOS): 38.58 lb (1.93 lb/ac)

Current Load (EOS): 38.29 lb (1.91 lb/ac)

SEDIMENT

Baseline Load (EOS): 5.11 tons (0.26 tons/ac)

Current Load (EOS): 2.36 tons (0.12 tons/ac)

CROP CATEGORY

Enter the following information for the entire growing cycle of this crop, as applicable. Note that some BMPs such as enhanced nutrient management, dairy feed management, and conservation tillage will be credited automatically if the information entered on this page reflects any of these practices. If you plant commodity cover crops, they should be added as a crop to be included in your rotation. If you plant conservation cover crops, enter this information at the bottom of the page for the crop preceding the cover crop. Enter crop management information for as many years as your crop rotation is long.

Crop category:*

Crop:*

Plant date:* Year 1 1

Planting method:*

Seeding rate: seeds/ac

COMMERCIAL FERTILIZER APPLICATIONS

Enter all commercial fertilizer applications used on this field. Please enter the total nitrogen and total phosphorus values (not ammonium or phosphate).

Application 1

Year 1 1

lbs/ac

lbs/ac

Total P

Application

FERTILIZER APPLICATIONS

Applications for the given year. If pasture, manure generated by livestock is for based on the information entered in the grazing livestock section. manure values.

IDENTIFYING BEST MANAGEMENT PRACTICES AND POLICIES



Toolbox

Global Partnership
on Nutrient Management

BMPs Search Template

Sector Type

BMP Category

Climatic Zone

Agriculture Types

Only show practices scalable to small farms?

Search

Reset

Barnyard Runoff Control

Category: Erosion Control, Manure Management

Practice Type: Structural

Landuse/Agriculture Type: Animal Confinement

Climatic Zones: Temperate, Tropical, Semiarid

Regions: North America, Europe

Pollutants Treated: Nitrogen, Phosphorus, Sediment

N Efficiency¹: 20%

P Efficiency¹: 20%

S Efficiency¹: 40%

Description: Barnyard or feedlot runoff controls

collect, treat, and reduce runoff from barnyards. The controls make up a system of components like erosion-resistant channels, subsurface drains with rock filled trenches along building foundations below eaves, underground outlets, roof gutters, surface water diversions, and downspouts. Managing runoff from barnyard areas can help to avoid excessive runoff of manure and sediment from loafing lots and manure piles in and around the animal confinement area. ²

Implementation Considerations: Dairy farms may need specialized treatment of milking parlor wastewater in addition to standard feedlot runoff controls.

Scalable to small farms? Yes

¹ "Documentation: Source Data, BMP Effectiveness Values." Chesapeake Assessment Scenario Tool. Web. 2013. <http://castool.org/Documentation.aspx>.

² Estimates of County-level Nitrogen and Phosphorus Data for Use in Modeling Pollutant Reduction Documentation for Scenario Builder Version 2.2." Chesapeake Bay. Dec. 2010. Web. May 2013. http://archive.chesapeakebay.net/pubs/SB_V22_Final_12_31_2010.pdf.



Gutters used to control roof runoff in Benton County, MN. Photo courtesy Benton SWCD.

IDENTIFYING BEST MANAGEMENT PRACTICES AND POLICIES



Toolbox

Global Partnership
on Nutrient Management

Policies Search Template

Category

Policy Type

Region

Sector

Text Search

Search

Reset

Danube River Protection Convention (DRPC)

Category: Institutions & Capacity; Regulatory Approaches

Policy Type: Bridging Institutions; Environmental Caps & Limits

Sector: Mixed

Region: Europe

Country: Austria; Bulgaria; Croatia; Czech Republic; Germany; Hungary; Moldova; Romania; Slovakia; Slovenia; Ukraine

Description: The Danube River Protection Convention (DRPC) forms the overall legal instrument for cooperation on transboundary water management in the Danube River Basin. This involves measures to reduce the pollution loads entering the Black Sea from sources in the Danube River Basin, which are based on the polluter pays principle and the precautionary principle.

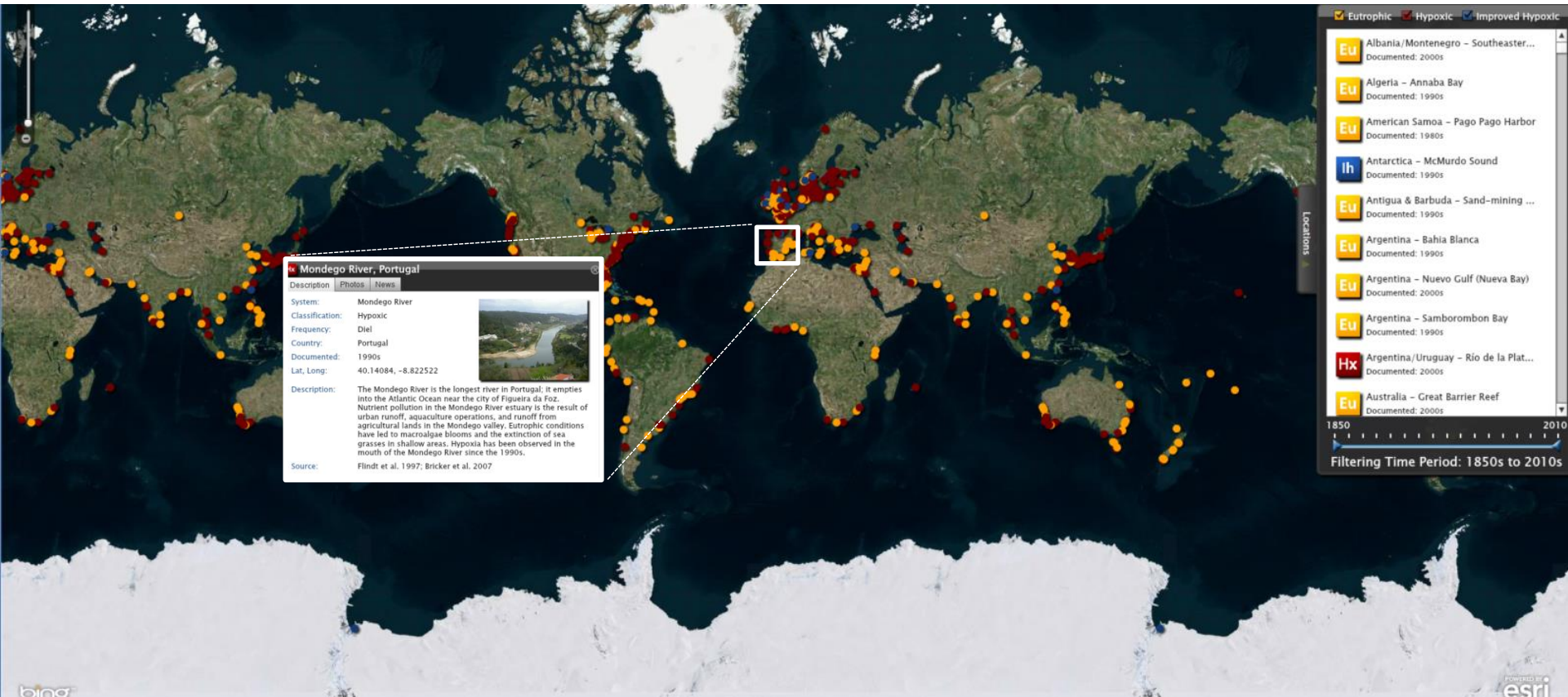
Outcome: The Danube River Protection Convention (DRPC) aims to ensure that surface waters and groundwater within the Danube River Basin are managed and used sustainably and equitably.

Reference: [Danube River Protection Convention \(DRPC\)](#)

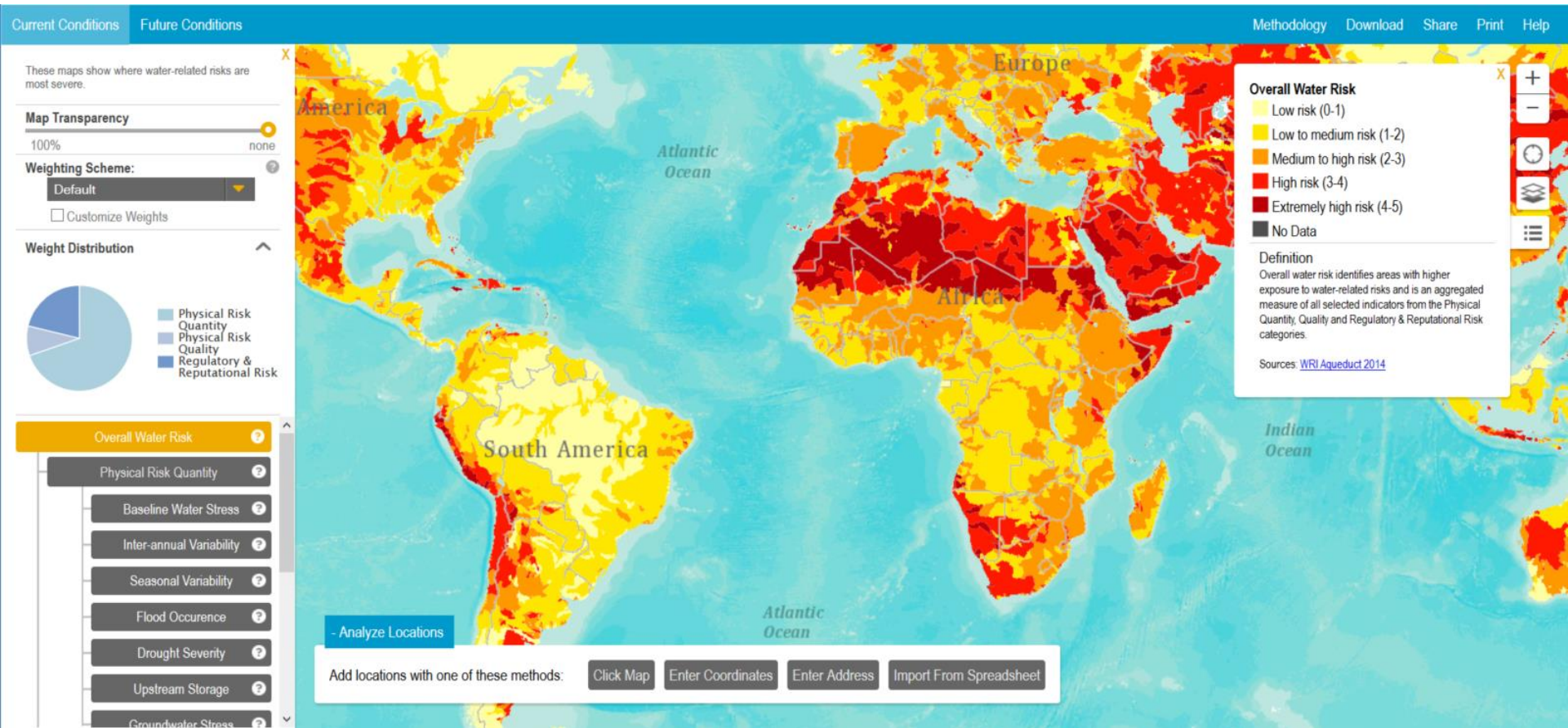
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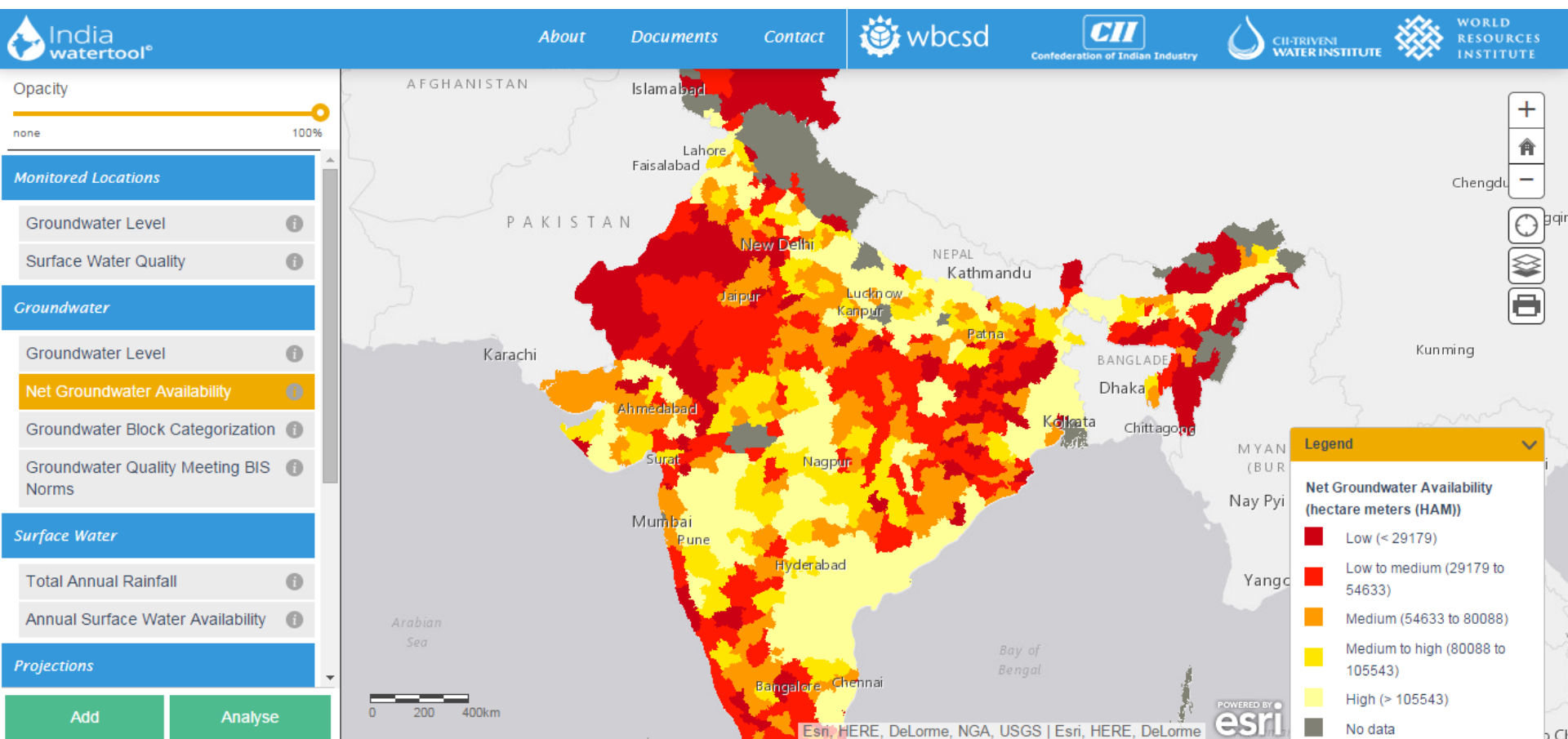
INTERACTIVE MAP OF EUTROPHICATION AND HYPOXIA



GLOBAL WATER RISK ATLAS



INDIA WATER TOOL



WRI'S STRENGTHS

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CORPORATE CONNECTIONS



ADDITIONAL PARTNERS



Kingdom of the Netherlands



The Government of Denmark



ADM CAPITAL



Bloomberg



WRI'S VISION OF ENGAGEMENT

Component 1

- Understand technical, financial, social-political barriers to change at all levels of society

WRI Offer

- Conduct research and analysis of barriers
 - Interview network of stakeholders in private sector, government, civil society
 - Conduct literature review on practices and policy effectiveness, economics

WRI'S VISION OF ENGAGEMENT

Component 2

- Consolidate methods and good practices to address issues of excessive N_r
- Define programs and policies for improved N_r management

WRI Offer

- Expand policy database:
 - to include policies good for the “Nutrient Nexus”
 - To strengthen evaluation methods
- Conduct economic analyses of policies
- Showcase policy success stories and lessons learned

WRI'S VISION OF ENGAGEMENT

Component 4

- Raise awareness and share knowledge

WRI Offer

- Develop web-based platforms and multimedia tools
- Convene and connect private sector and science-policy sector

THANK YOU!

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