Water Quality - Atmospheric Deposition Integrated Monitoring for Nutrients

Workshop Summary

Presented to NWQMC
April 10, 2017

National Atmospheric Deposition Program

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

USGS
science for a changing world

FOREST SERVICE U S DEPARTMENT OF AGRICULTURE

Challenging Nutrients Coalition

Workshop objective:

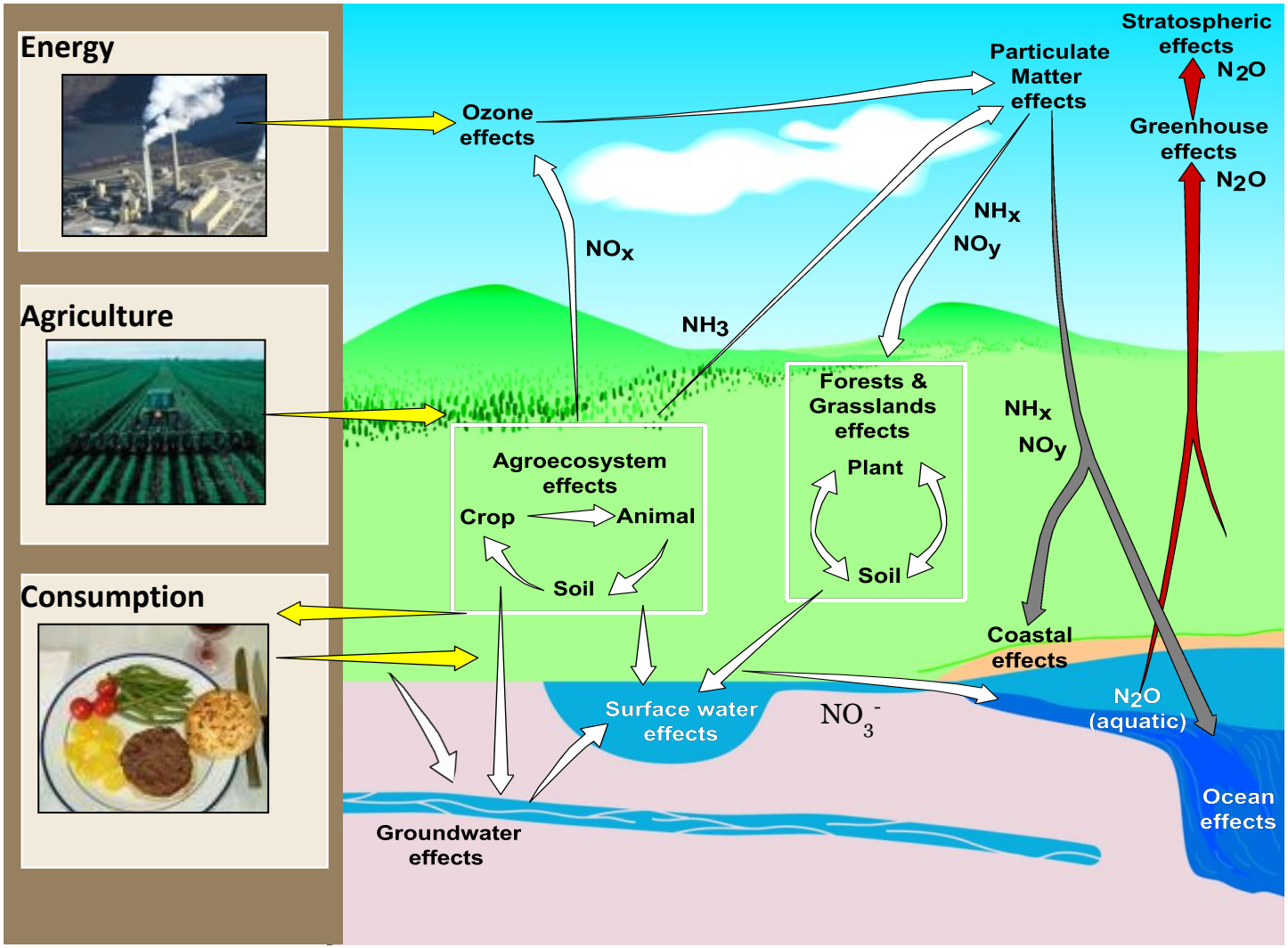
Framing a vision for better integration of atmospheric deposition and water quality monitoring for nitrogen and phosphorus.

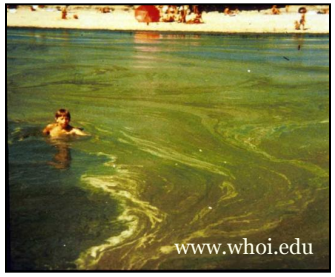
- Current state of monitoring?
- What are the gaps and needs?
- Case studies of integrated monitoring
- Follow-up activities

Participants:

Federal agencies (USGS, EPA, USFS, NOAA, USDA, NPS), academics, stakeholder groups

National, multi-media monitoring program that monitors N sources, transport and transition is needed[1]





[1] Science Advisory Board, 2011 Report

Modified from Galloway et al. (2003) and Compton et al. 2011

Atmospheric deposition can be significant contributor to watershed N budget

Image credit: savebuzzardbay.org

N loading from atmospheric deposition:

25%
Chesapeake Bay[1]

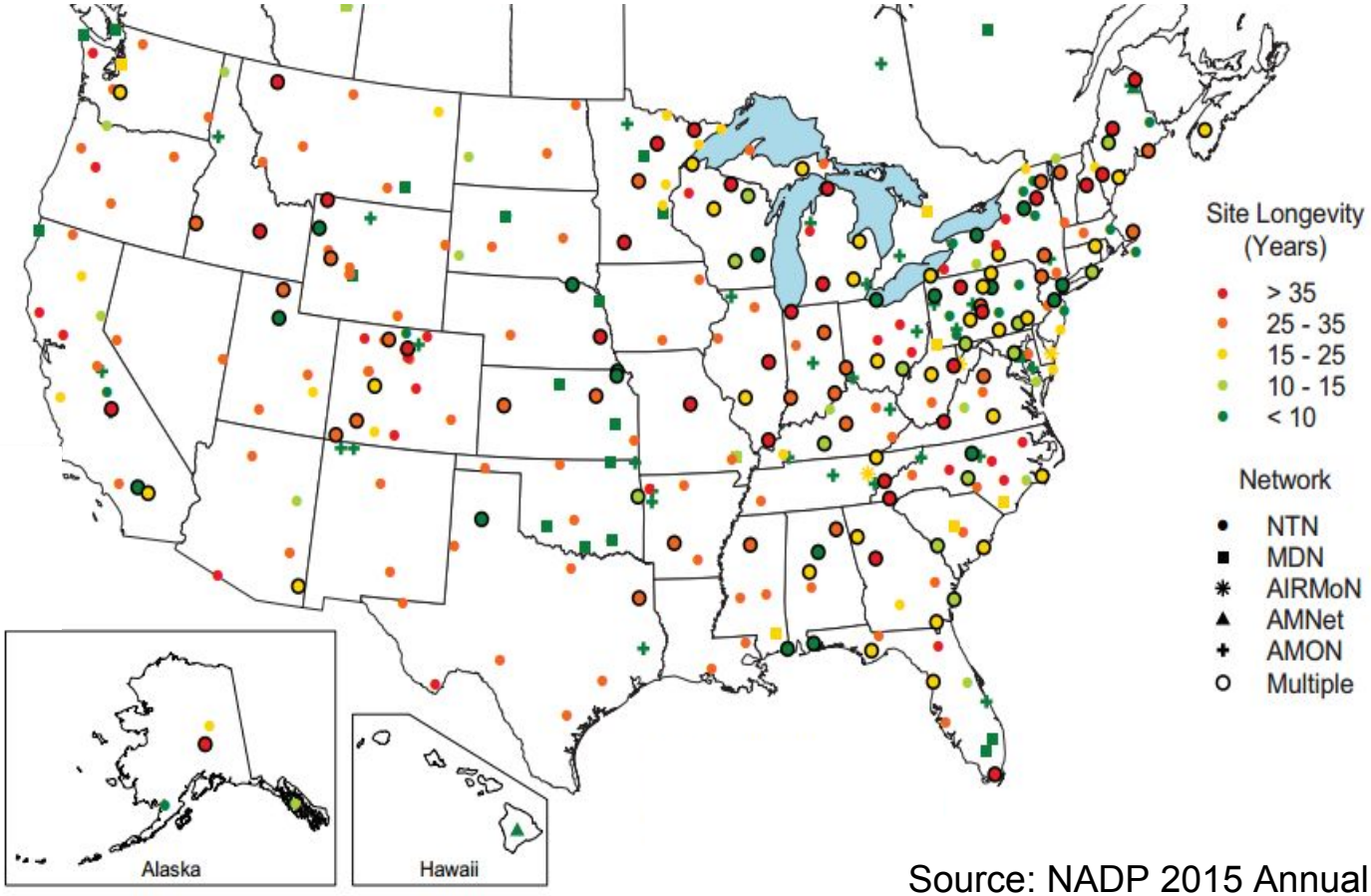
60%
Penobscot[2]

70%
Tampa Bay[3]

[1] Chesapeake Bay Program; [2] Boyer et al. (2002); [3] Poor et al. (2012)

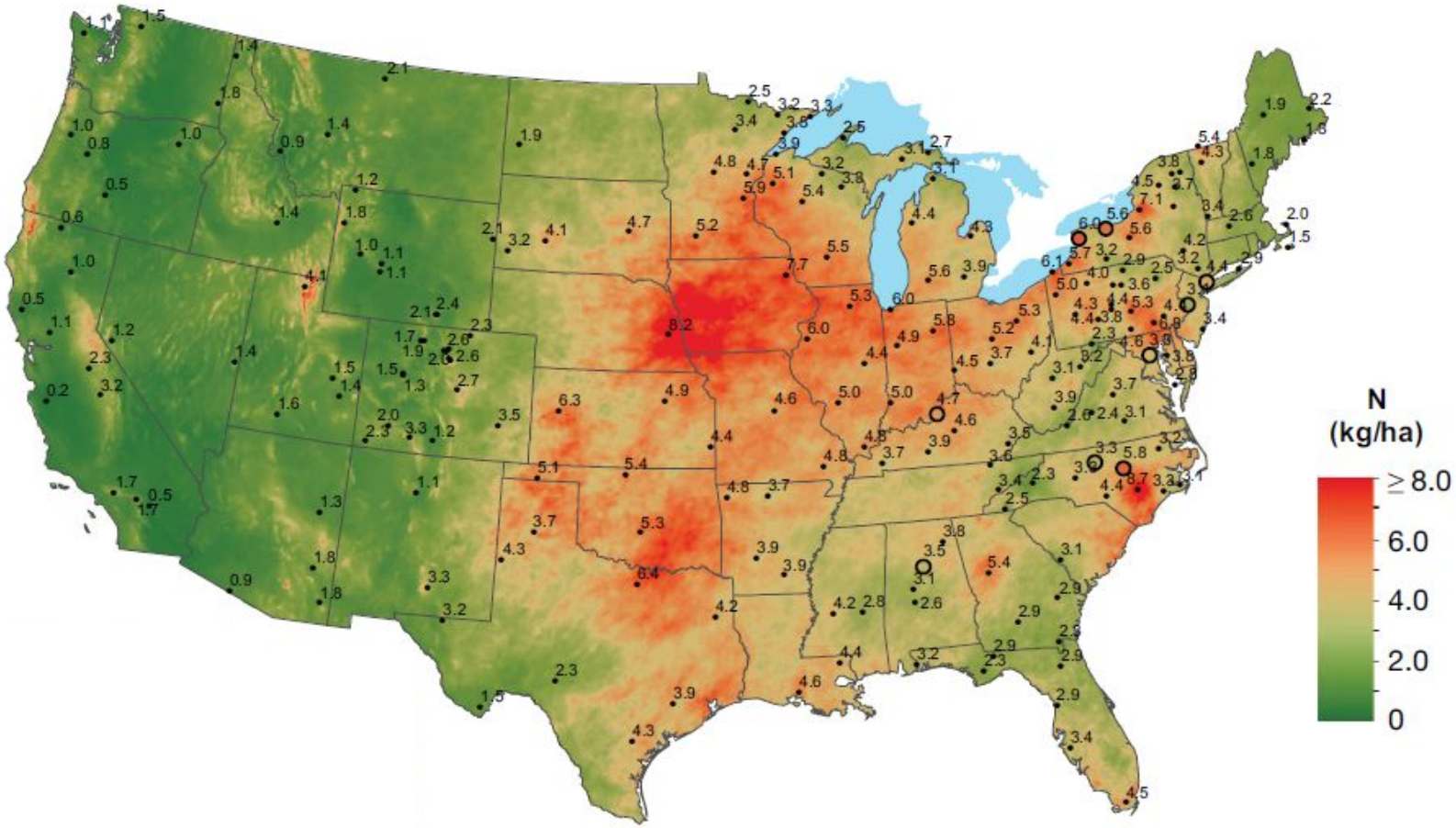
Nationally consistent sampling protocols, analysis, QA/QC, and data management

Active deposition monitoring sites



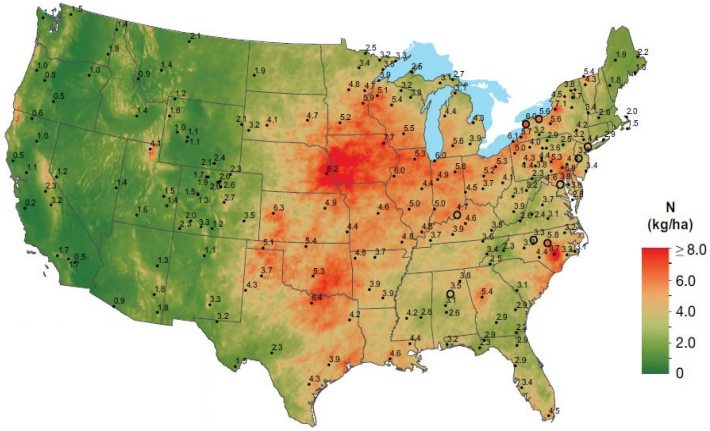
Source: NADP 2015 Annual Summary

Atmospheric Deposition - Total N



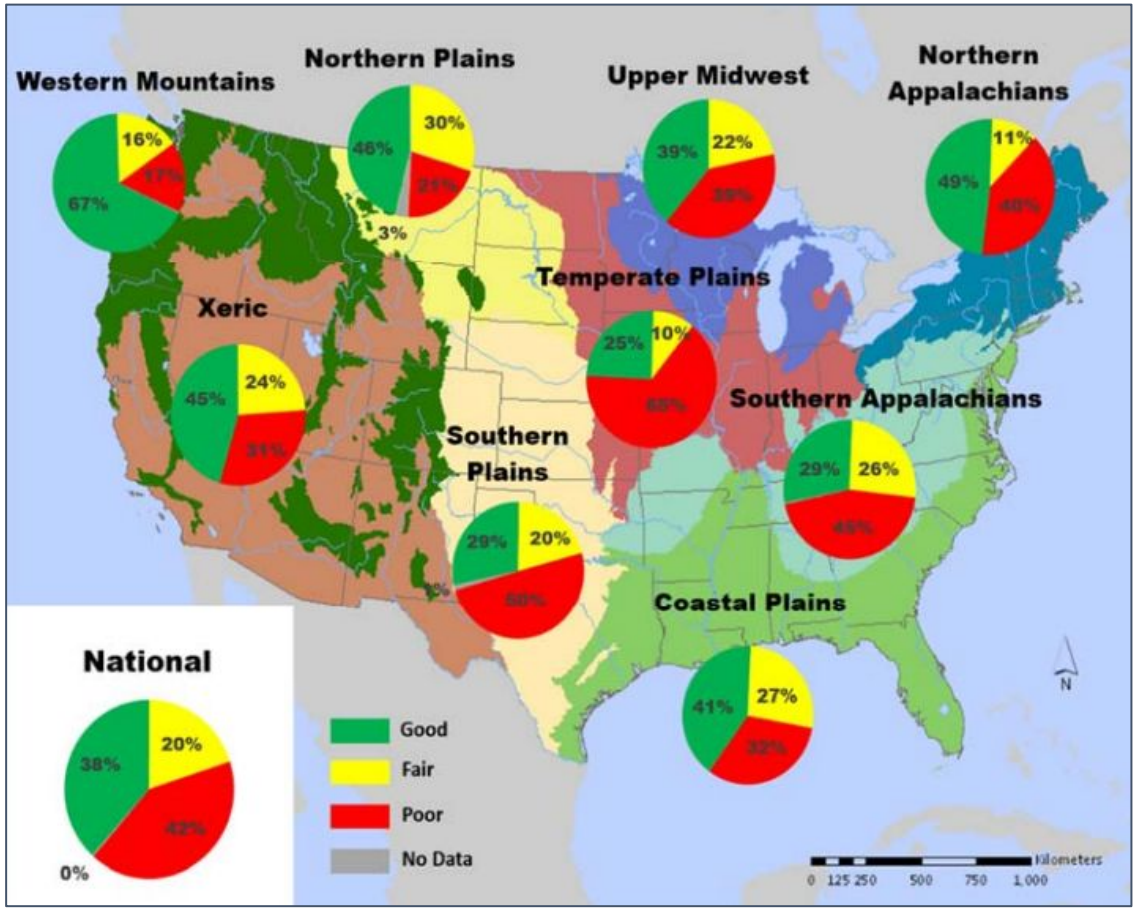
Source: NADP 2015 Annual Report

Improving linkages between deposition and water quality



Deposition - Total N

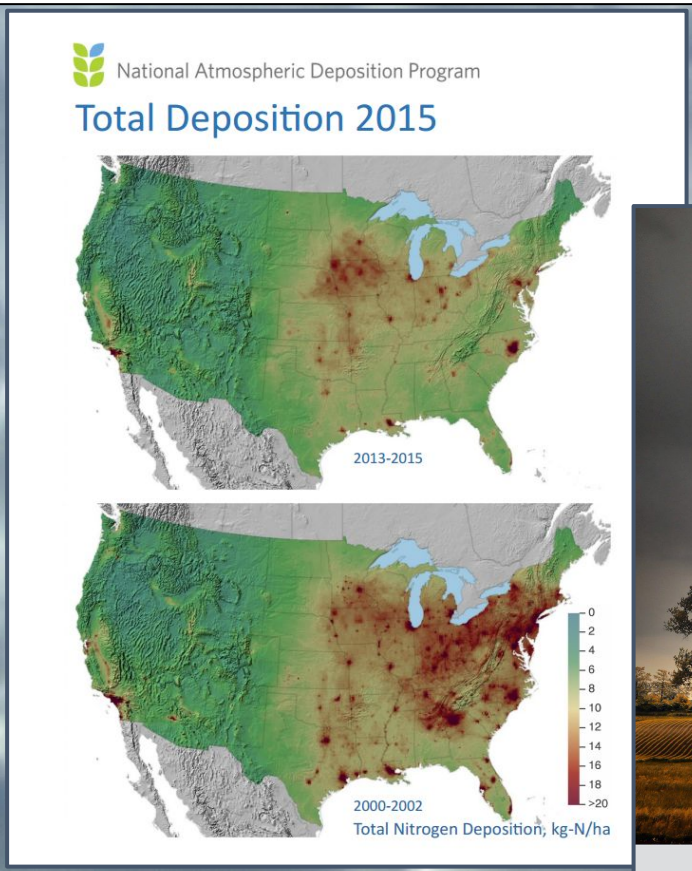
Total N in Rivers & Streams



Source: EPA National River & Stream Assessment, 2008-09

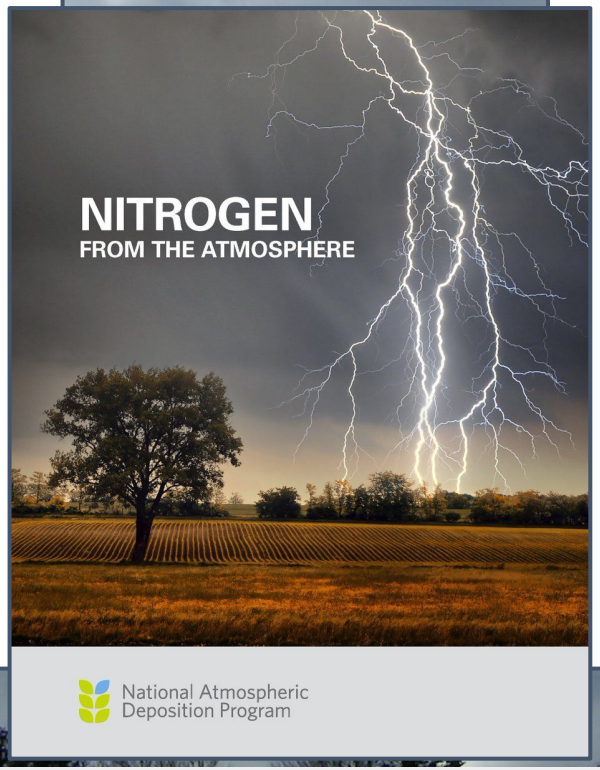
Forms of N deposition

Ex: wet/dry, ammonium/nitrate



http://nadp.sws.uiuc.edu/lib/tdep/TDEPreport15.pdf

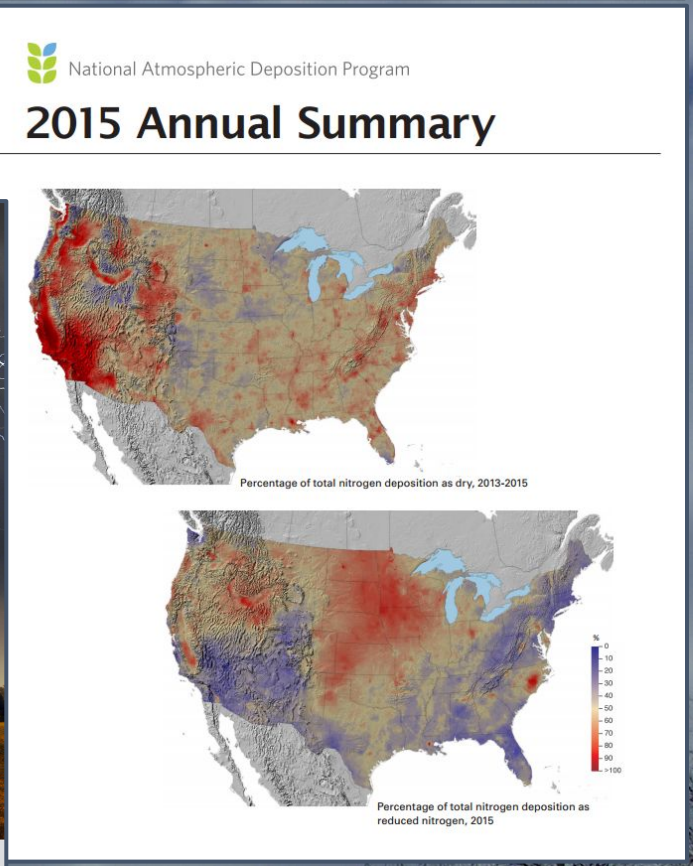
Sources of N deposition



http://nadp.sws.uiuc.edu/lib/brochures/nitrogenAtmos.pdf

Maps of deposition

Ex: nitrogen, sulfur, mercury, calcium



http://nadp.sws.uiuc.edu/lib/data/2015as.pdf

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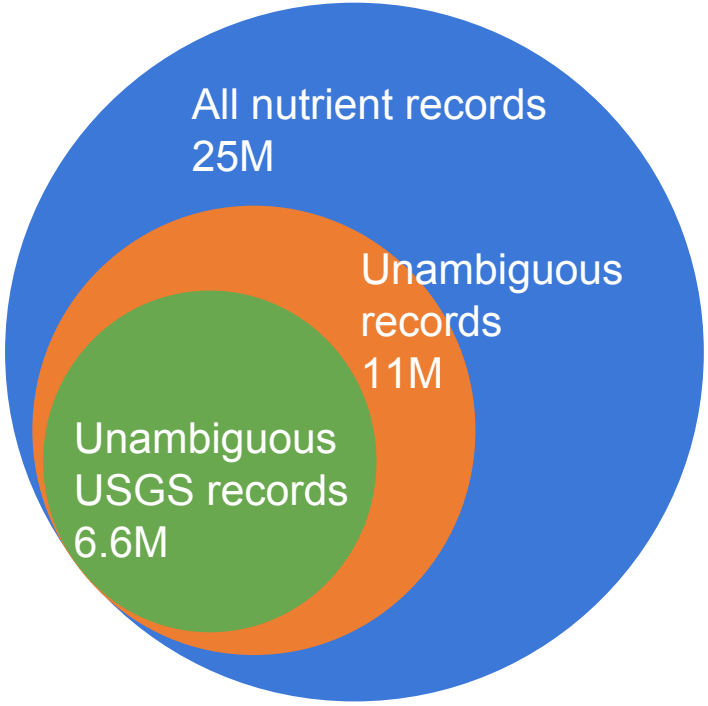
Workshop: gaps and needs

Data consistency

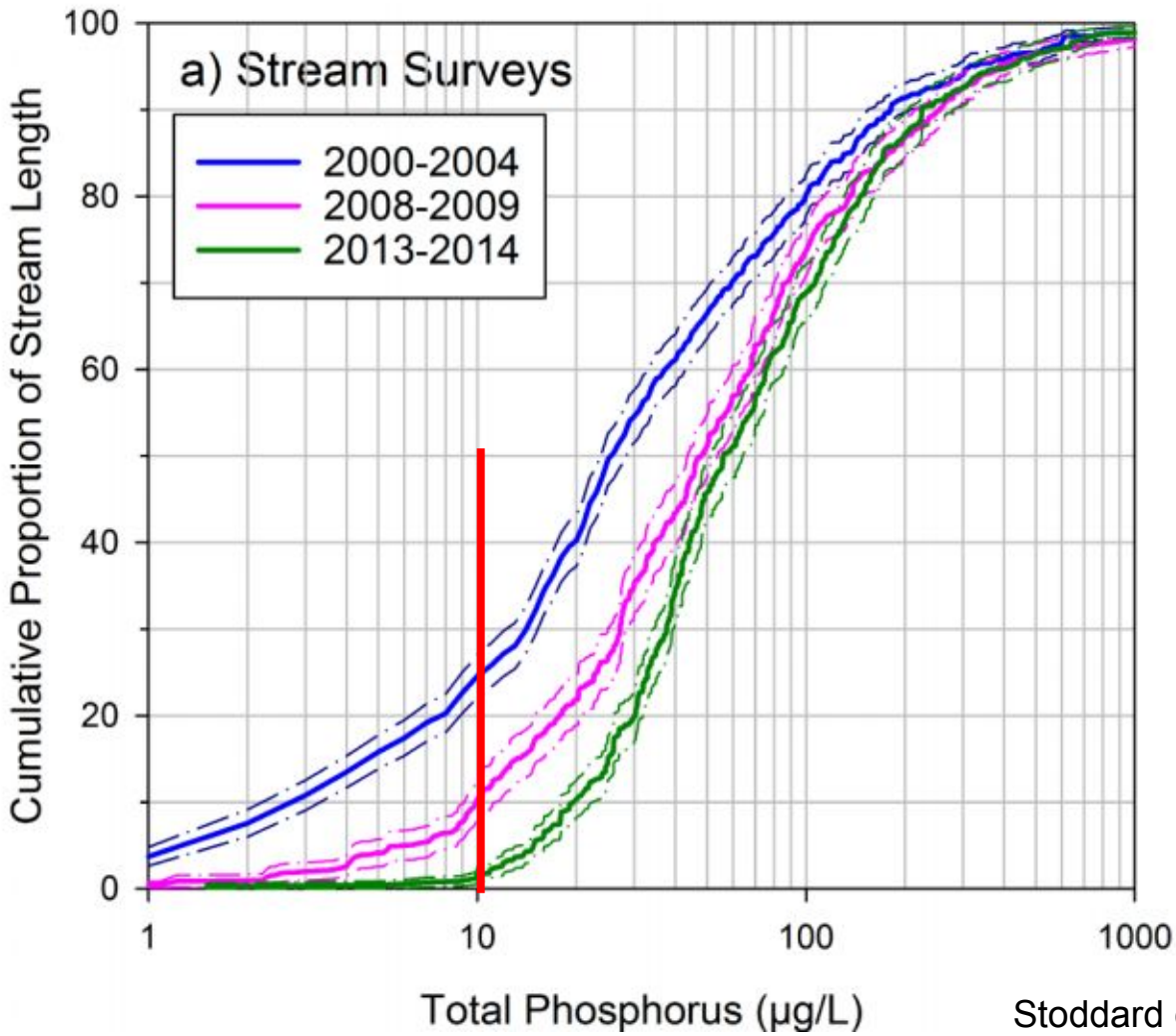
meta data; naming conventions



Sprague et al. (2017)

Sensors

Phosphorus - the known unkown

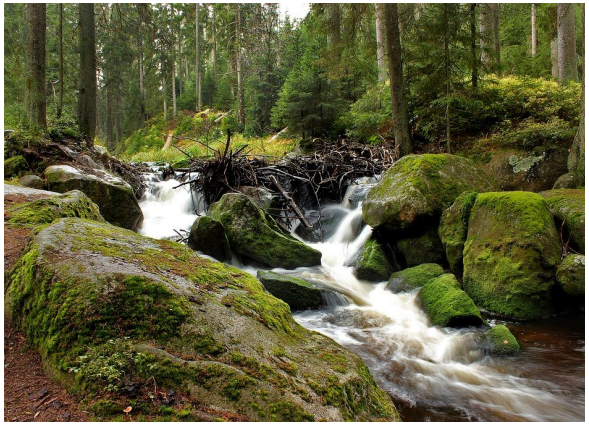


Stoddard et al. (2016)
EPA/NARS Assessments

Case studies highlighting value of integrated monitoring

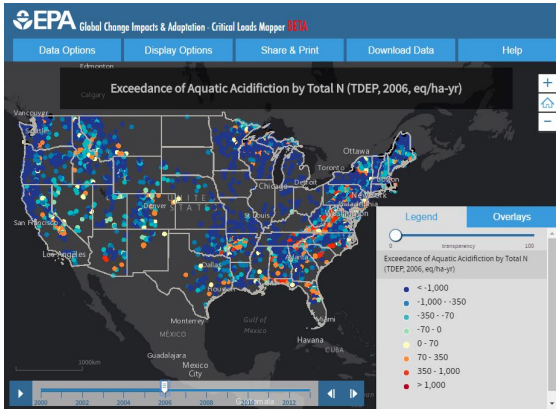
Deposition in urban environments
Pam Templer, Boston University

Acid deposition to forested streams
Doug Burns, USGS



Coastal Blue Carbon
LaToya Myles, NOAA

Critical Loads
Jason Lynch, EPA



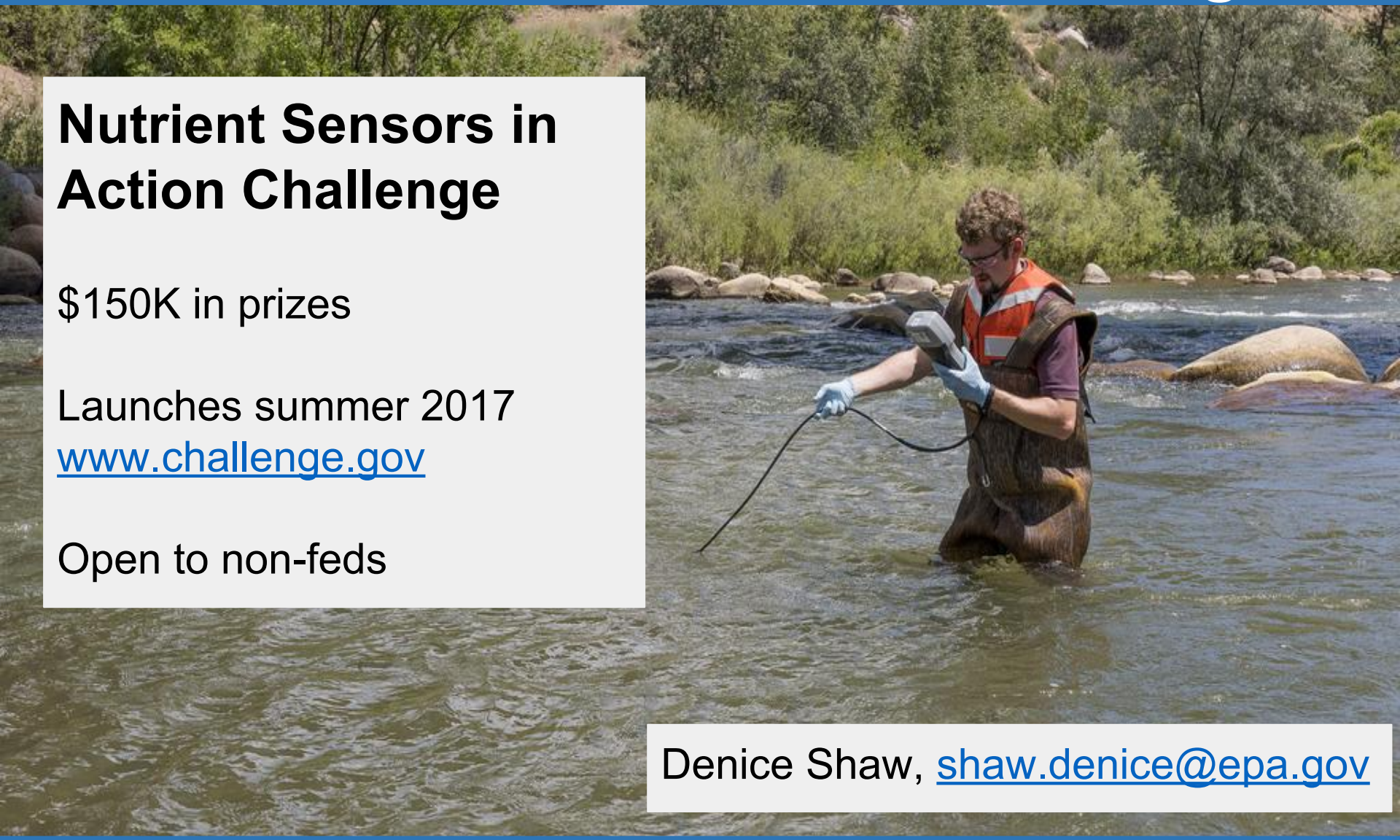
Determining priorities and next steps

Water Quality - Atmospheric Deposition Integrated Monitoring (WAIM)

National Atmospheric Deposition Spring Meeting,
Monday, April 24, 2017
Louisville, KY

Total Deposition (TDEP) and Critical Loads (CLAD) sessions too!

Deploying low-cost continuous N and P sensors to inform decision making



Nutrient Sensors in Action Challenge

$150K in prizes

Launches summer 2017
www.challenge.gov

Open to non-feds

Denice Shaw, shaw.denice@epa.gov

Want to join the conversation about gaps, priorities, and next steps towards integrated monitoring?

Are you already using deposition data to inform water quality decisions?

Interested in piloting continuous N and P sensors?

Reach out to us!

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