CWA 303(d), Program Vision and Nutrients

EPA Watershed Branch
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Cross-Program Meeting
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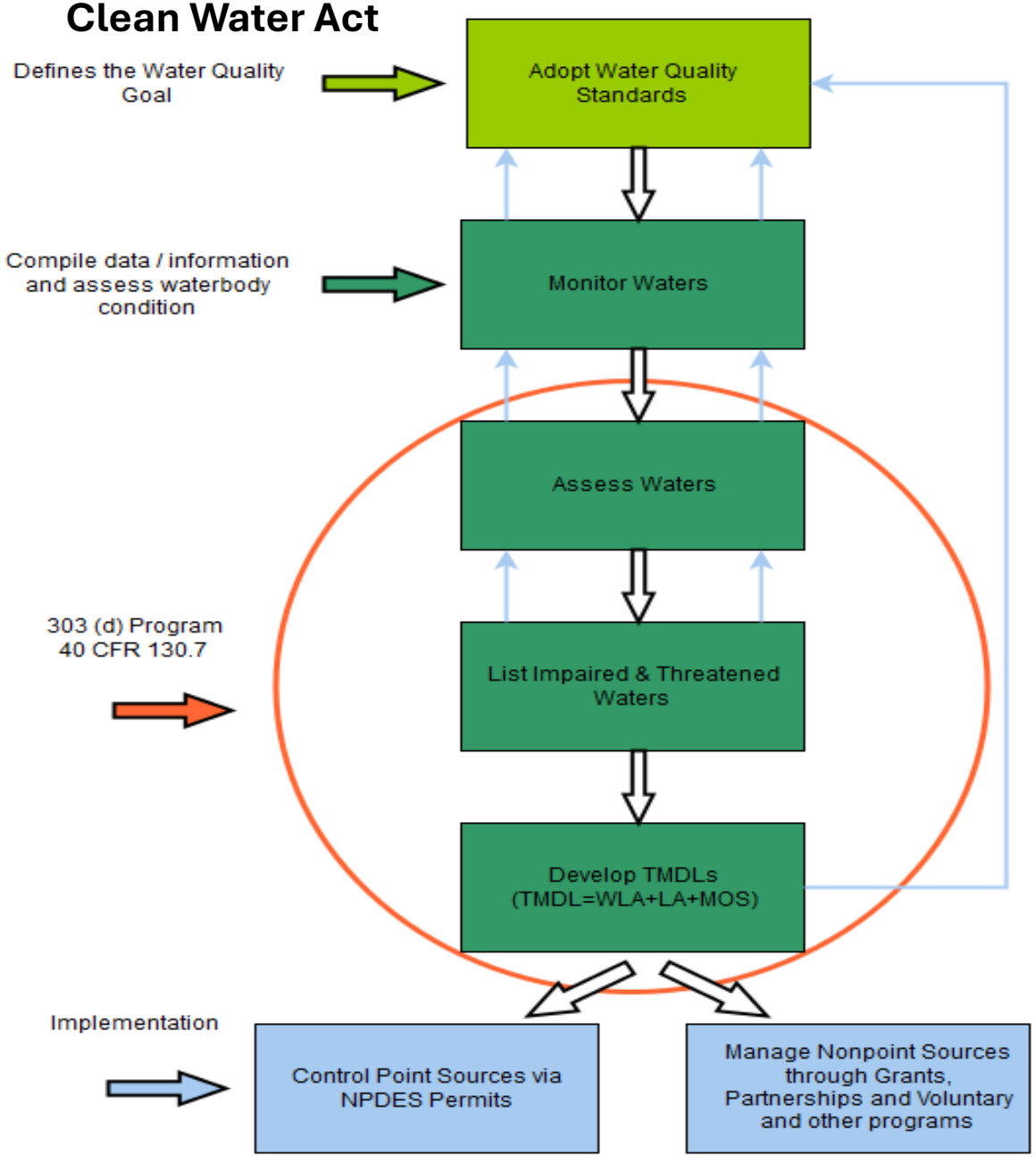
Water Quality-Based Approach of the Clean Water Act



Key government partners for 303(d): WQS, monitoring, permitting, NPS, Geographic Programs.

Many others, e.g.,: Ag, land management, fisheries, transportation, local, state, emergency response, drinking water, EPA regional and HQ, tribes.

Important TMDL basics:

Science document addressing ALL loadings of pollutant(s) specifying amount that can be allowed and still meet WQS with a margin of safety.

Not self implementing.

Describes reasonable assurance for meeting loads where mix of point sources and NPS (set “at levels” to attain WQS).

Equation where all pollutant loadings quantified.

Perspective – 303(d) Program Development Trajectory

2022-2032 CWA 303(d) Program Vision

The CWA Section 303(d) Program strives to strategically plan and prioritize activities, engage partners, and analyze and utilize data to develop water quality assessments, plans, and implementation approaches to restore and protect the Nation's aquatic resources

Goals

Planning and Prioritization

Data and Analysis

Protection

Restoration

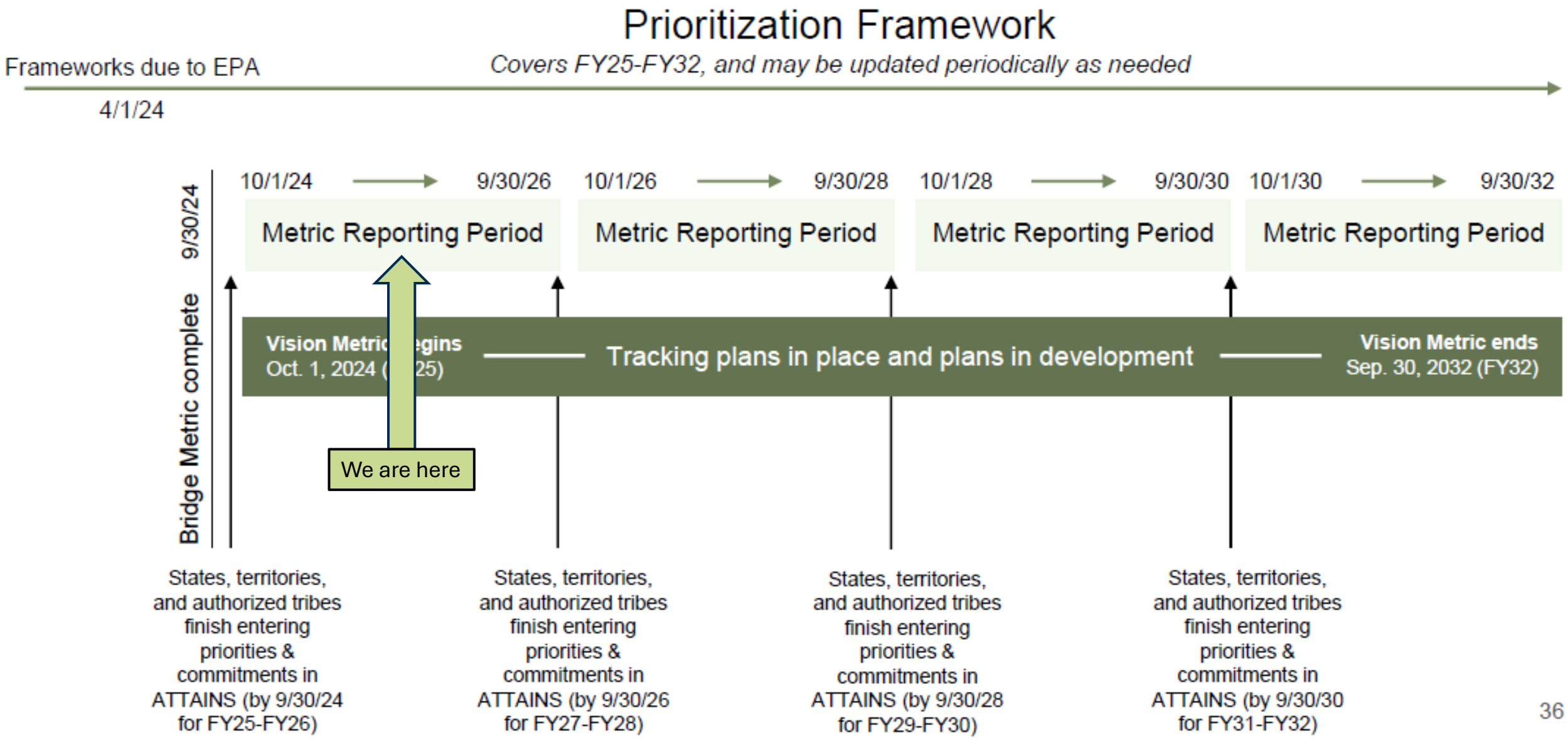
Partnerships: Integration and Engagement

Active Focus Areas

Program Capacity Building

Tribal Water Quality and Program Development

Prioritization Framework and Vision Metric Timeline



Nutrient-related plans and listings - statistics

Prioritization Frameworks and Metric

- number of states that specifically discuss nutrients in prioritization frameworks: 34 of 40
- 50 states and DC, Puerto Rico and US Virgin Islands submitted priorities for first two-year metric

FY25-26 Vision Metric Priorities (waterbody-parameter combinations)

- number of nutrient related priorities: 930, by 40 states
- number of total priorities: 7,383, by 53 states

Total Actions to date:

- number of nutrient related TMDLs: 19,513 by 50 states, DC, PR, and USVI
- number of nutrient related ARPs: 269 by 15 states
- number of nutrient related protection plans/approaches: 8,603 by 5 states

Total Assessments (latest cycle):

- number of waters with nutrient-related listed impairments (Cat 5): 75,227
- number of nutrient related impaired waters (Cat 4 and 5): 115,236
- number of waters on the 303d list (Cat 5): 702,303
- number of impaired waters (Cat 4 and 5): 989,503

303(d) Prioritization Frameworks

Highlights on Framework Themes: Work across programs to set priorities; Targeted engagement techniques; Science-based targets; Right plan for situation (TMDLs, ARPs, Protection Plans); Plans set for implementation success; Effectiveness Monitoring/Tracking Implementation

Overviews of Frameworks: First Vision (ELI 2016); Vision 2.0 (ELI overview in progress)

Vision Goals and Opportunities for Nutrients

	Planning and Prioritization	Data and Analysis	Protection	Restoration	Partnerships: Integration and Engagement
Vision Goals					
Nutrient-related Opportunities	*Coordinate across programs / Nutrient-related priorities / RPS / Consider range of time horizons / Use right tool*	*Sound science translating narratives / Effectiveness monitoring / Modeling Efficiencies / Collaborative data sources / EPA technical assistance*	*Save energy and resources by maintaining water quality / Easier to prevent than restore*	*Design plans for success / engage key partners / consider methods for achieving loading mix throughout TMDL process / engage NPS programs and 402 on implementation*	*Seek buy-in at multiple steps in the process / Clear communication / bring in partners to design for success*

Opportunity – Restoration and Protection Screening Tool

- EPA recently added National Nutrient Inventory indicators into the RPS Tool.
- This free, publicly available RPS Tool and associated data library were developed by OWOW to support strategic planning of priority waters and watersheds for restoration and protection. Ecological, stressor and social indicators.
- EPA also recently released the Web RPS Tool, which is a web-based application for watershed comparison and priority-setting that includes advanced mapping and data visualization features. There have been projects in dozens of states and territories.
- Recently (since 2023), at least 5 projects used nutrient-related indicators (MA, and NPS projects - Kentucky, Washington, and West Virginia, California)

Possible Opportunity – Lake Model Comparison to Support Nutrient TMDL Development

(2024 EPA ROAR project, currently impacted by funding and staff uncertainties)

- This ongoing project aims to improve the model selection process and support water quality management goals by aligning the relative complexity of candidate nutrient lake models with the dynamics in different types of lakes, applicable water quality standards, and data availability and gaps.
- Objective: Compare lake models and develop a decision tree to help environmental managers identify the appropriate model(s) for a nutrient-impaired lake, providing a scientific basis for decision making.
- Analysis of lake characteristics, data requirements, and WQS with several lake models will include:
  - Identifying lakes with a range of characteristics (well mixed vs. stratified, different meteorologic conditions, etc.)
  - Selecting zero-, one-, and two-dimensional models for the study (candidates include BATHTUB, LAKE2K, CE-QUAL-W2, WASP)
  - Applying, evaluating, and comparing 3 selected models on 3-5 lakes with different characteristics
- Evaluate modeling results to develop a scientifically rigorous comparative analysis and stepwise decision matrix for lake nutrient model selection, providing a consistent rationale for nutrient lake model selection.
- Flexible framework so states wishing to use a different model can determine where their model of choice fits within the model characteristics.

Opportunity -- Feasibility when considering loading mix – describing edge of field targets (Used with Permission).

Agricultural Nonpoint Sources: Edge-of-Field Targets

SNAPPLUS YIELD TARGETS

Table 1. Agricultural total phosphorus (TP) and total suspended solids (TSS) yield target for TMDL Subbasins. Targets are comparable to outputs from SnapPlus and correspond to attainment of TMDL agricultural load allocations. The targets are calculated from baseline yields for each TMDL Subbasin and percent reductions for the TMDL Subbasin. Cells with '-' indicate model subbasins that lack sufficient agricultural area to establish a baseline load.

TMDL Subbasin	TP			TSS		
	Baseline (lbs./ac/yr)	% Reduction	Target (lbs./ac/yr)	Baseline (tons/ac/yr)	% Reduction	Target (tons/ac/yr)
1	1.68	88%	0.20	1.71	47%	0.91
2	2.74	79%	0.57	2.72	47%	1.45
3	3.41	79%	0.71	3.29	79%	0.69
4	2.10	88%	0.25	1.80	47%	0.96
5	3.14	74%	0.83	2.64	64%	0.96
6	2.31	88%	0.27	2.33	47%	1.24
7	2.14	88%	0.25	2.16	47%	1.15
8	2.14	83%	0.37	2.30	47%	1.22
9	1.90	88%	0.22	1.94	47%	1.03

Agricultural NPS: Defined Baseline and Feasibility Analysis

- Helps evaluate, prioritize, and identify needed management practices.
- Strengthens reasonable assurance section of the TMDL.

Category	Baseline TMDL practice	Conservation Scenario 1	Conservation Scenario 2
Tillage	Moldboard, chisel + disc, disc, strip or no-till	Dairy and Cash Grain: No till used on all years of crop rotation. Potato and Vegetable include spring cultivation.	Same as #1
Cover Crops	None	Dairy rotation: Winter Rye after corn silage - 2 out of 3 yrs. Cash Grain: small grain cover crop after harvest - 3 out of 6 yrs. Potato/Vegetable: small grain after potato harvest - 1 out of 2 yrs.	Same as #1 Same as #1 Same as #1
Contour Farming	None	Field farmed on contour	Same as #1
Fertilizer Application	Spring or In-Season application	Same as baseline	Same as baseline
Solid Manure Application: method, rate, and timing	Spring or Fall+ Winter application; surface applied or incorporated	No winter application; same baseline timing and rate. No manure incorporation, only surface applied	Same as #1
Liquid Manure Application: method, rate, and timing	Spring or Fall + Winter application; surface applied or incorporated	No winter application; same baseline timing and rate; all liquid manure injected, no surface or incorporation	Same as #1
Dairy Rotation - Forage	Alfalfa: Spring seeding + 3 more alfalfa yrs.	Alfalfa-Grass - Fall or Spring seeding + 3 more alfalfa-grass yrs.	Same as #1
Edge of Field Filter Strip	None	None	Edge of Field Filter Strip established and maintained over crop rotation

Further Sources for Examples

- National 303(d) Training Presentations (scores can be found here). Example topics include:
  - Designing plans for implementation Success (See WI 2024 presentation)
  - Use of narrative criteria for listing and TMDLs (See CT 2023 presentation)
  - ELI recently categorized presentations by topic (including about 50 on nutrients)
- Story Map Listing and TMDL examples
- 2024 IR Memo – Considerations for listing with both numeric and narrative criteria. Examples include NM and Ohio using narrative criteria.
- Clean Water Pod – Through a cooperative agreement with NEIWPCC
  - 11 nutrient-related episodes
  - Featuring state and local officials and scientists.
  - Highlight great partnerships, community engagement and buy-in, innovative financing, market-based approaches, protection and much more.

Not Intended As Endorsement of All Aspects of Examples

Clean Water Pod – nutrient related episodes

- Nutrient Regulations Preempt Restoration Costs in Colorado Reservoirs -- June 23, 2025
- Wisconsin Utilities and Farmers Work Together to Improve Water Quality -- March 19, 2025
- Interstate Collaboration to Reduce Phosphorus Pollution in Lake Champlain -- January 7, 2025
- City of Boise Reaps Savings Offsetting Phosphorus Pollution at Idaho's Dixie Drain Facility -- December 4, 2024
- Protecting Clean Water in New Mexico's Rio Hondo -- May 31, 2024
- Using Nature-Based Solutions to Address Nitrogen Pollution on Cape Cod -- April 29, 2024

Clean Water Pod – Nutrient-related episodes (continued)

- The Power of Partnership in Maryland’s Choptank River Watershed -- March 26, 2024
- Oysters: Redefining New Hampshire's Restoration and Restaurant Scenes -- February 27, 2024
- Maryland’s Solution to Nutrient Pollution in the Chesapeake Bay – February 5, 2024
- Reducing Nutrient Pollution from Septic Systems in Montana’s Flathead Basin – December 27, 2023
- Too Much of a Good Thing: The Role of Nutrients in Water – November 6, 2023

Other Resources

- Watershed Academy, including module on nutrients
- TMDL Foundations Training
- Compendia of Practices through cooperative agreement with ELI, e.g.,:
  - **The Compendium of Approaches to Evaluating the Water Quality Effects of TMDL Implementation**: Download this document that highlights the diversity of approaches used by states, conveys lessons learned, details terminology challenges, and identifies relevant resource materials.
  - **The Compendium of Approaches to Clean Water Communication**: Access websites, interactive maps, videos, presentations, flyers, and other approaches that states, territories, and tribes have used to communicate with the public about water quality.
  - **The Compendium of State Approaches to Protection**: Access this Story Map providing examples of various ways that state CWA 303(d) programs have sought to protect healthy waters.
- EPA technical assistance (limited), e.g., modeling, public engagement
- Webinar Series through a cooperative agreement with NEIWPCC
- 303(d) success stories through a cooperative agreement with NEIWPCC
- Modeling workgroups, including with ACWA Modeling Workshops