Nutrients and the Clean Water Act Section 303(d) Listing and TMDL Program

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Overview

- Clean Water Act Section 303(d) program basics

- National statistics on nutrient-related listings and TMDLs

- Summary of approaches used to identify waters impaired by nutrients

- Summary$_{of\ a}$ pproaches used to develop$_{water}$ quality targets for nutrient TMDLs

- Ongoing program activities and direction

CWA Framework

Defines the water quality goal →

Adopt Water Quality Standards

Compile data/information and assess waterbody condition →

Monitor and Assess Waters

303(d) Program 40 CFR 130.7 →

List Impaired & Threatened Waters
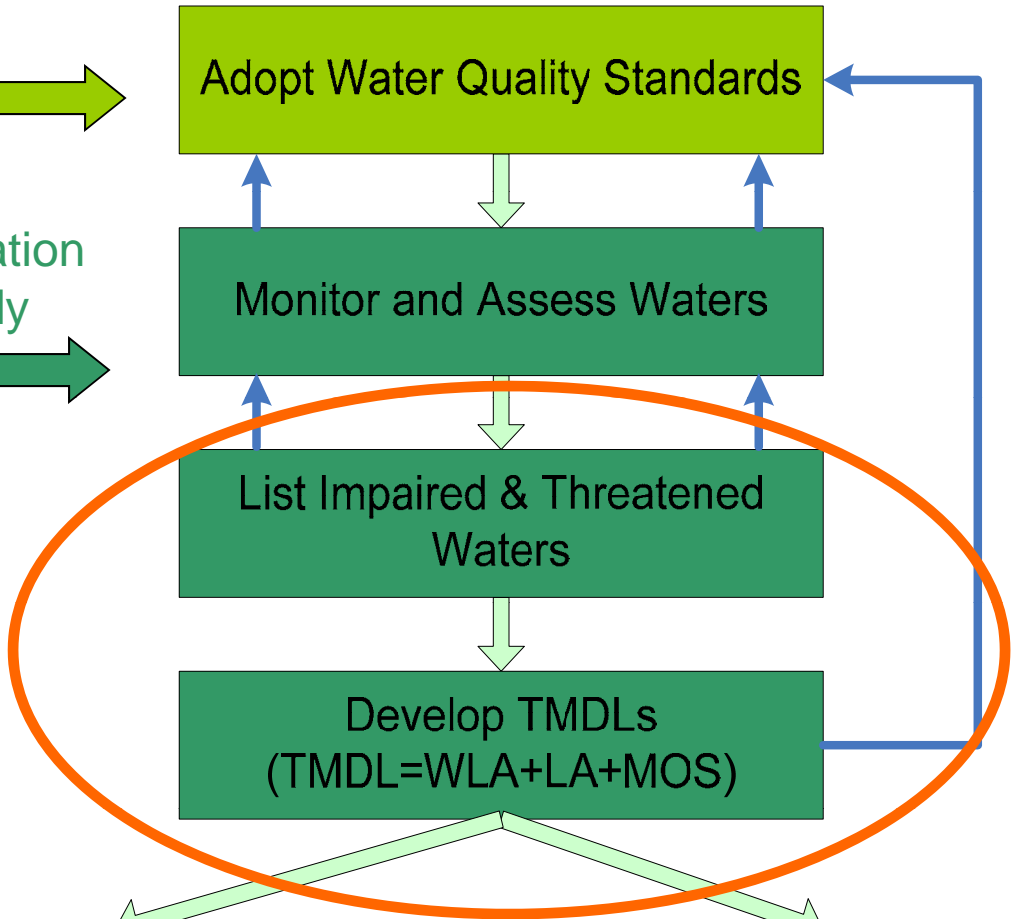
Develop TMDLs (TMDL=WLA+LA+MOS)

Implementation →

Control Point Sources Via NPDES Permits

Manage Nonpoint Sources Through Grants, Partnerships, and Voluntary Programs
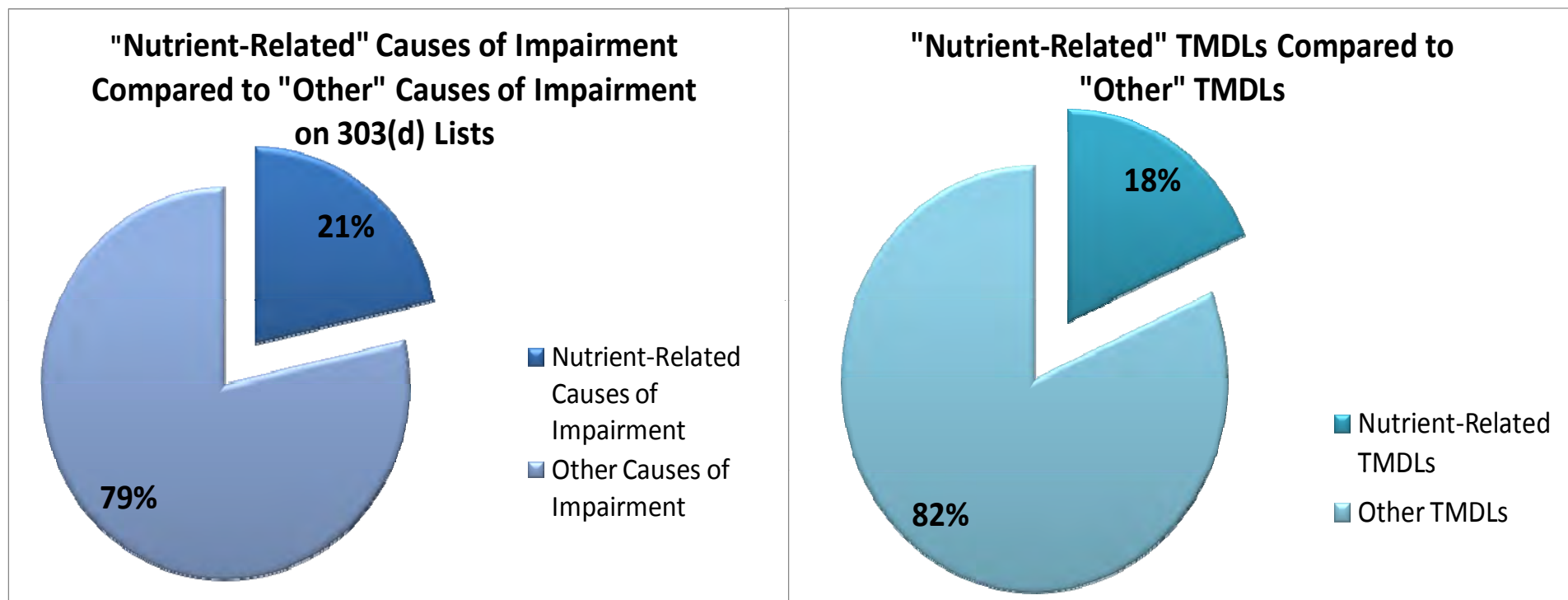
Trading

Regulations and Guidance on Nutrients TMDLs

- 130.7(c)(1) – States establish TMDLs at levels necessary to attain and maintain the applicable narrative and numerical WQS

- 130.7(c)(1)(i) - TMDLs may be established using a pollutant-by-pollutant or biomonitoring approach; in many cases both techniques may be needed. Site-specific information should be used wherever possible

- EPA's *Protocol for Developing Nutrient TMDLs (1999)* provides recommendations for selecting water quality indicators and target values:
  - If available, the numeric standard should be used as the TMDL indicator and target value
  - If numeric criteria are not available, or if supplemental indicators are needed, the TMDL developer should base selection on both scientific or technical considerations <u>and</u> practicality and cost considerations; the selection must necessarily consider site-specific factors
  - The target value for the chosen indicator can be based on: comparison to similar but unimpaired waters; user surveys; empirical data summarized in classification systems; literature values; or best professional judgment

National Nutrient-related listing and TMDLs

"Nutrient-Related" Causes of Impairment Compared to "Other" Causes of Impairment on 303(d) Lists

- 21%
- 79%

Nutrient-Related Causes of Impairment

Other Causes of Impairment

"Nutrient-Related" TMDLs Compared to "Other" TMDLs

- 18%
- 82%

Nutrient-Related TMDLs

Other TMDLs

- Of the 71,000 waterbody-pollutant combinations listed nationally, over 15,000 (21%) can be categorized as nutrient-related (defined as 'nutrients, organic enrichment/oxygen depletion, noxious plants, algal growth, and ammonia').

- Of the 43,000 TMDLs that have been developed nationally, over 7,500 (18%) address nutrient-related causes of impairment.
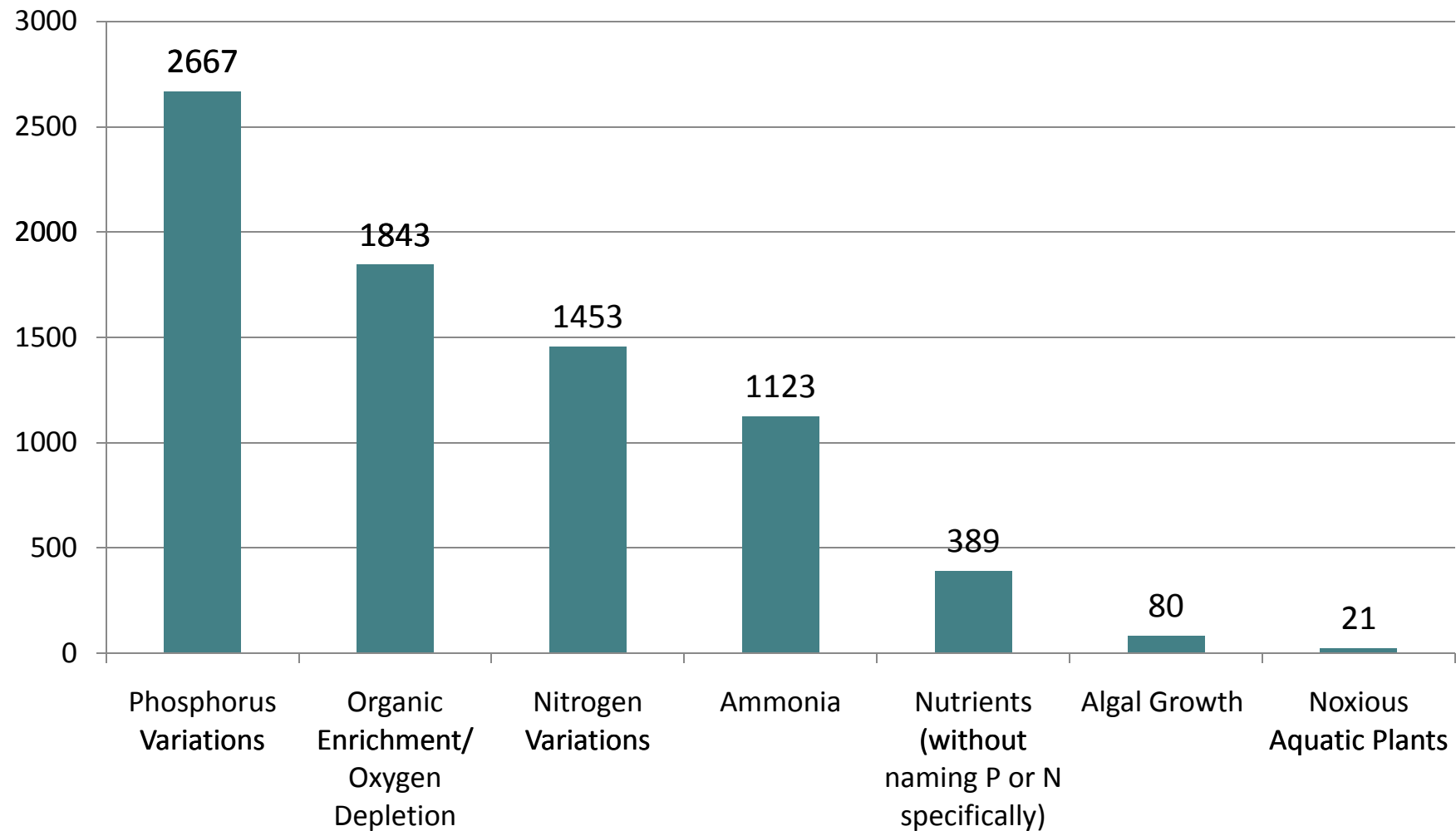
Based on 303(d) list data available in ATTAINS as of July, 2010. http://www.epa.gov/waters/tmdl/expert_query.html

Nutrient-Related 303(d) Listings by Parent Category
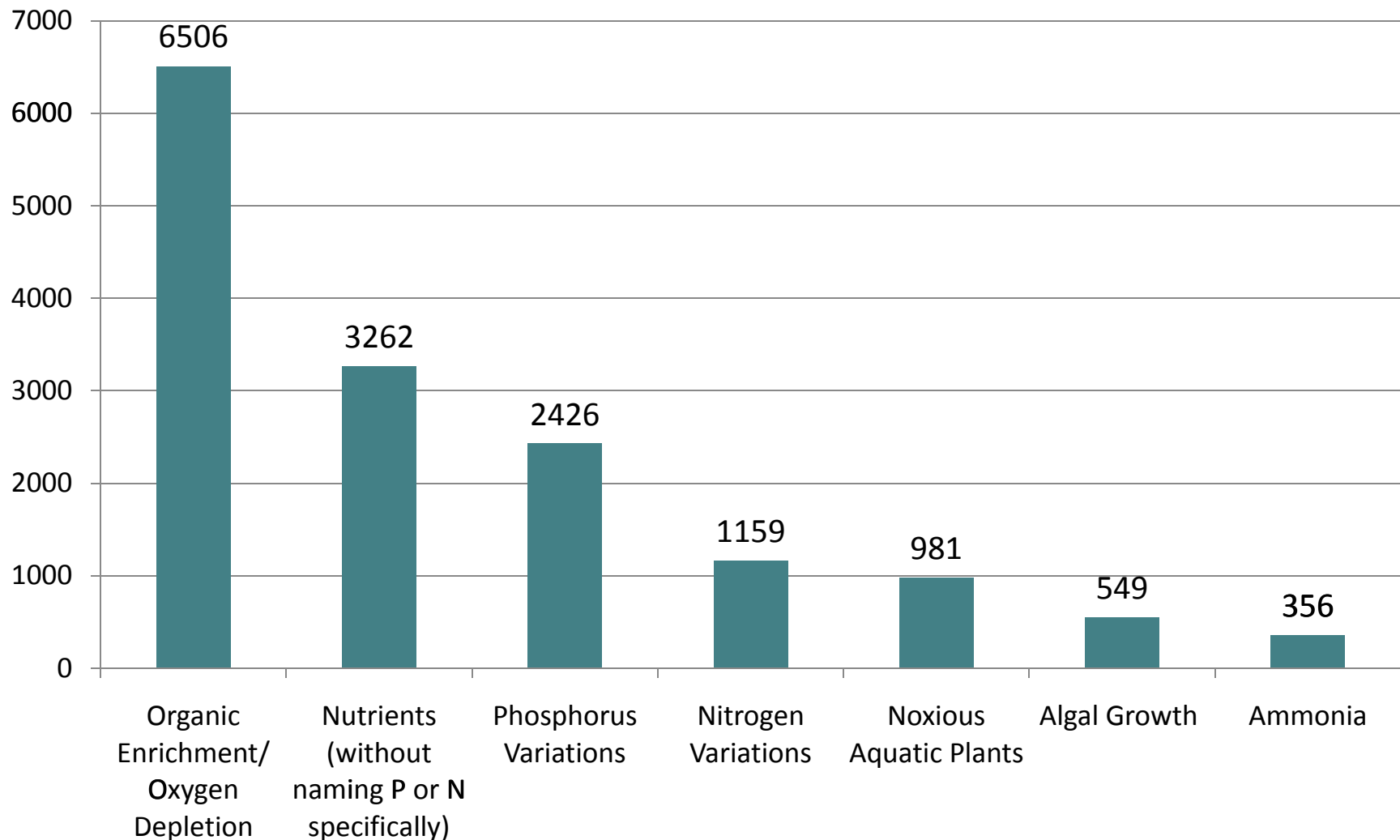
* Based on 303(d) list data available in ATTAINS as of July, 2010. http://www.epa.gov/waters/tmdl/expert_query.html

Nutrient-Related TMDLs by Parent Category

Bar chart data:
- Phosphorus Variations: 2667
- Organic Enrichment/Oxygen Depletion: 1843
- Nitrogen Variations: 1453
- Ammonia: 1123
- Nutrients (without naming P or N specifically): 389
- Algal Growth: 80
- Noxious Aquatic Plants: 21

* Based on 303(d) list data available in ATTAINS as of July, 2010. http://www.epa.gov/waters/tmdl/expert_query.html

Number of Clean Water Act Nutrient-related Impaired Waters by State

Legend:
- 0 to 100 nutrient-related listings (29)
- 101 to 300 nutrient-related listings (13)
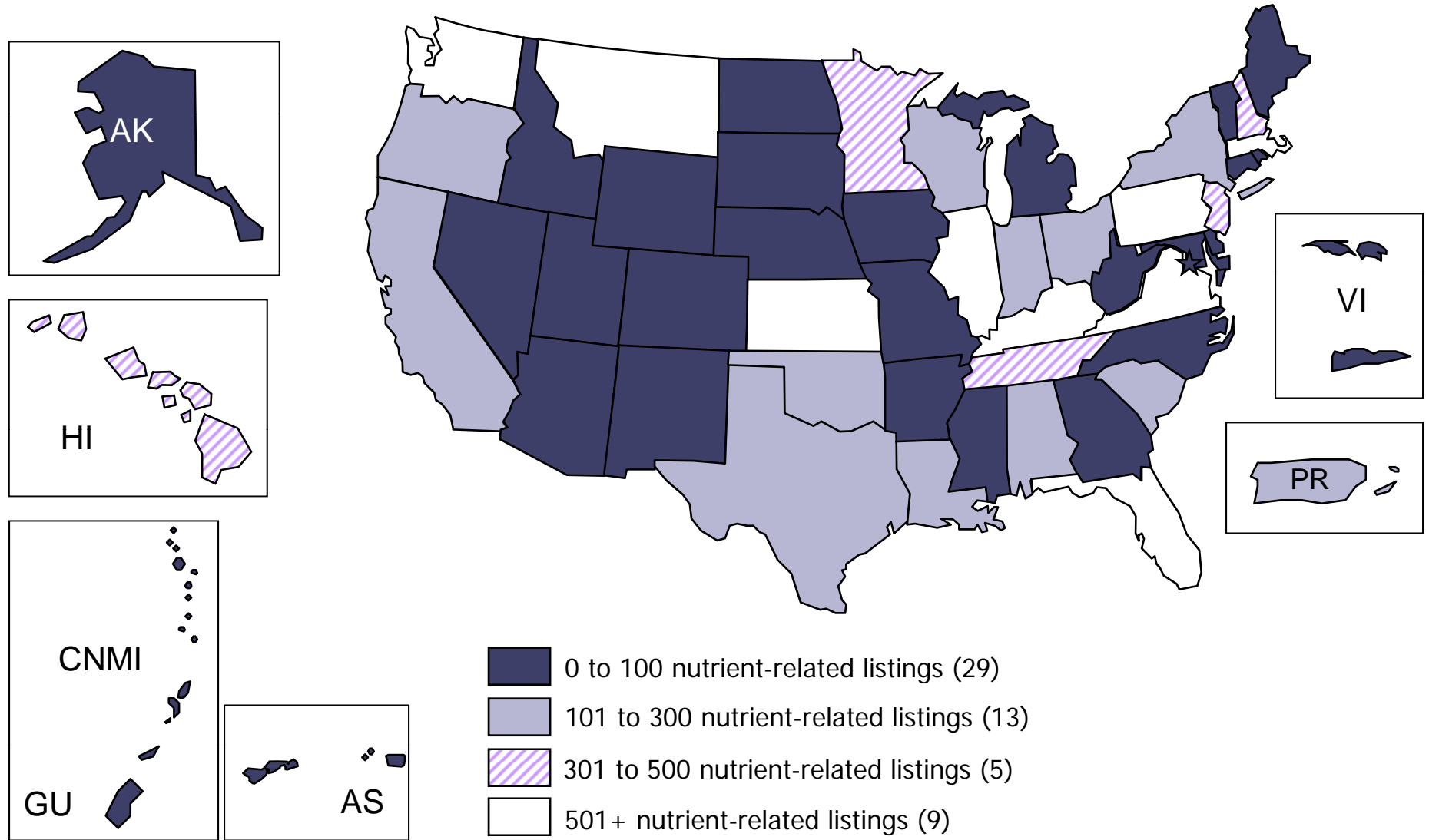- 301 to 500 nutrient-related listings (5)
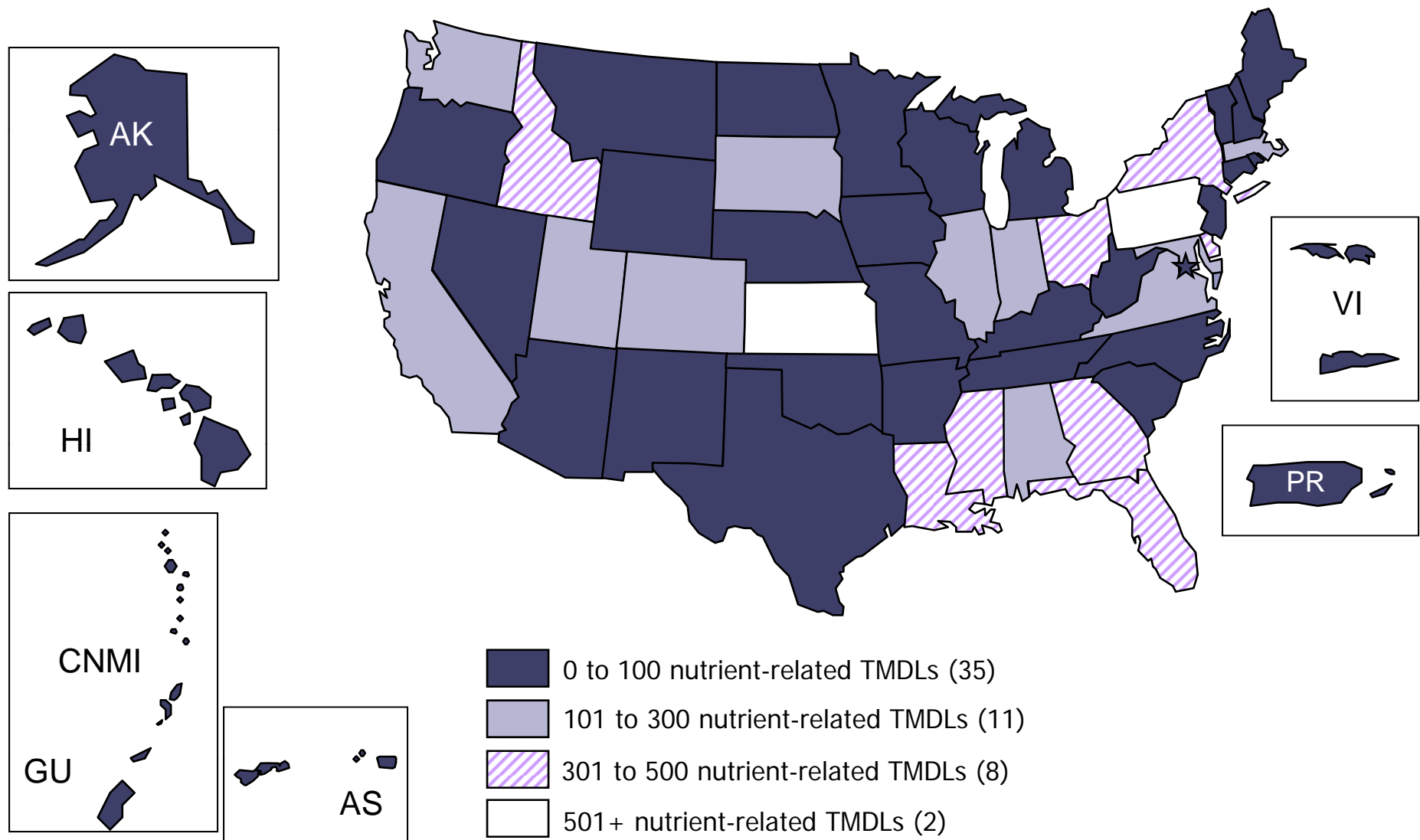- 501+ nutrient-related listings (9)

* Based on 303(d) list data available in ATTAINS as of July, 2010. http://www.epa.gov/waters/tmdl/expert_query.html

Number of Clean Water Act Nutrient-Related TMDLs by State

Legend:
- 0 to 100 nutrient-related TMDLs (35)
- 101 to 300 nutrient-related TMDLs (11)
- 301 to 500 nutrient-related TMDLs (8)
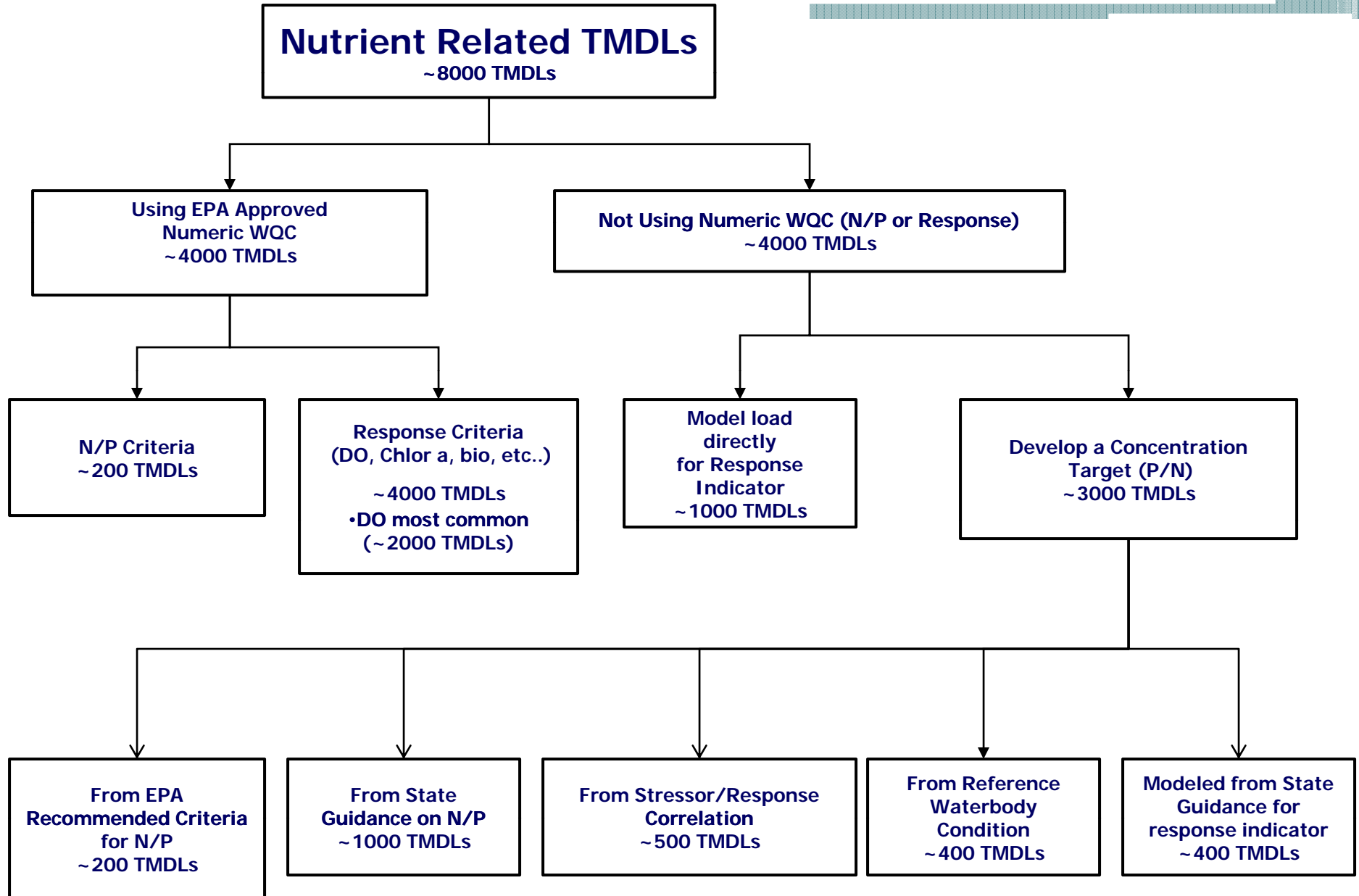- 501+ nutrient-related TMDLs (2)

* Based on 303(d) list data available in ATTAINS as of July, 2010. http://www.epa.gov/waters/tmdl/expert_query.html

Summary of Observed Approaches
Nutrient-Related 303(d) Listings and TMDLs

- **Listing for nutrient and nutrient-related impairments based on:**
  - Numeric criteria for causal parameter (e.g., nitrogen or phosphorus)
  - Numeric criteria for response indicator (e.g., dissolved oxygen, chlorophyll a, turbidity)
  - Narrative criteria using translation (e.g., no imbalance of indigenous population, no nuisance algae)

- **TMDLs controlling nitrogen and/or phosphorus:**
  - Nitrogen or phosphorus water quality concentration as the basis (e.g., nitrogen or phosphorus numeric criteria concentrations)
  - Modeled nitrogen or phosphorus loads <u>without</u> nitrogen or phosphorus water quality concentration (e.g., model nitrogen loads from chlorophyll a water quality target)

Nutrient Related TMDLs
~8000 TMDLs

Using EPA Approved Numeric WQC
~4000 TMDLs

Not Using Numeric WQC (N/P or Response)
~4000 TMDLs

N/P Criteria
~200 TMDLs

Response Criteria (DO, Chlor a, bio, etc..)

~4000 TMDLs
•**DO most common (~2000 TMDLs)**

Model load directly for Response Indicator ~1000 TMDLs

Develop a Concentration Target (P/N) ~3000 TMDLs

From EPA Recommended Criteria for N/P ~200 TMDLs

From State Guidance on N/P ~1000 TMDLs

From Stressor/Response Correlation ~500 TMDLs

From Reference Waterbody Condition ~400 TMDLs

Modeled from State Guidance for response indicator ~400 TMDLs

Nutrient Activities

Chesapeake Bay

- TMDL finalized in December 2010.
- TMDL addresses N, P and Sediment impairments in 92 tidal segments of Bay and tributaries
- States have worked with EPA to develop Implementation Plans – Relies on Adaptive implementation
  - Schedule for full implementation by 2025 – 60% by 2017
  - Two tier milestones for assessing progress
  - Both State and Federal consequences for failure to meet schedule

Mississippi River Basin

- The Hypoxia Task Force, a partnership of state and federal agencies established in 1997, continues to make progress by relying on voluntary programs from states and landowners to achieve nutrient reductions throughout the Mississippi River Basin.
- Key emphasis in encouraging partnerships with USDA and USGS to:
  - Promote sustainable agricultural practices
  - Reduce nutrient loadings in the Mississippi River Basin
  - Implement monitoring programs to measure nutrient reductions
- National Academy of Sciences committee established to provide advice to EPA, and other relevant parties, on strategic priorities and alternatives for specific actions regarding Clean Water Act implementation across the Mississippi River basin.

CWA Section 303(d) Efforts Moving Forward

- **Advance nutrient 303(d) program activities**
  - Identify barriers and opportunities for states to maximize use of the 303(d) program to address nutrients

- **TMDL Development**
  - Develop approaches to ensure that expected NPS reductions in TMDLs are reasonably assured

- **TMDL Implementation**
  - Develop tools for states to identify waterbodies with the highest potential for recovery
    - http://hudson.tetratech-ffx.com/RECOVERY_POTENTIAL/home.html

  - Additional emphasis on tracking waterbody restoration

Where we hope conference will help

- Expand our understanding of process used to identify nutrient-related impairments and develop nutrient TMDLs.
  - Compendium of Nutrient Listing and TMDL Practices

- Develop opportunities for states and stakeholders to share technical experience working on nutrient listings and TMDLs.

- Continue to improve methods for identification of waters with nutrient-related impairments and development of nutrient TMDLs

- Assess technical tools (gap analysis) to address nutrients through listing and TMDLs