N-STEPS Overview

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N-STEPS Contact

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N-STEPS Key Points

- What is N-STEPS?
- How do we get about it?
- What do we work on or What are we working on?

N-STEPS Key Points

- What is N-STEPS?
  - a technical and scientific resource for numeric nutrient criteria development efforts to support states, territories, and authorized tribes
- https://www.epa.gov/nutrient-policy-data/n-steps

N-STEPS Key Points

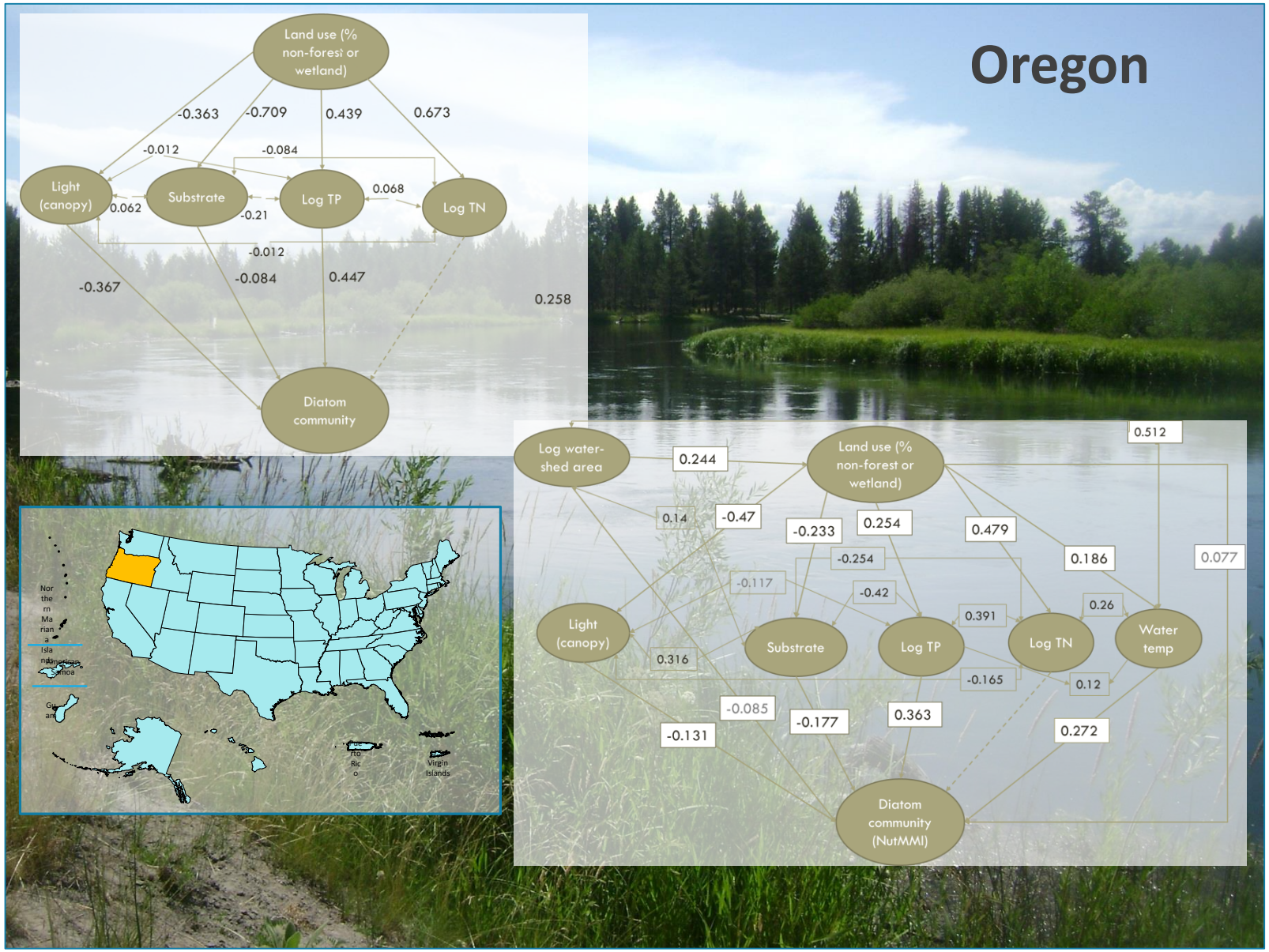
- How do we get about it?
  - Through technical exchange and collaboration between EPA, independent scientists, state, territories, and tribal agencies.

Limnology, Marine sciences, Statistical/mechanistic modeling, Biogeochemistry, Hydrology, Aquatic ecology, Biology, Environmental statistics.

Technical Analysis

Oregon DEQ

- Completed Phase I study
- Stream periphyton
- Applicability and utility in nutrient threshold development
- Massive data compilation effort
- Taxonomic reconciliation
- Responsive nutrient models
- Phase II study
- Validating models with independent data
- Structural equation modeling to test covariate effects

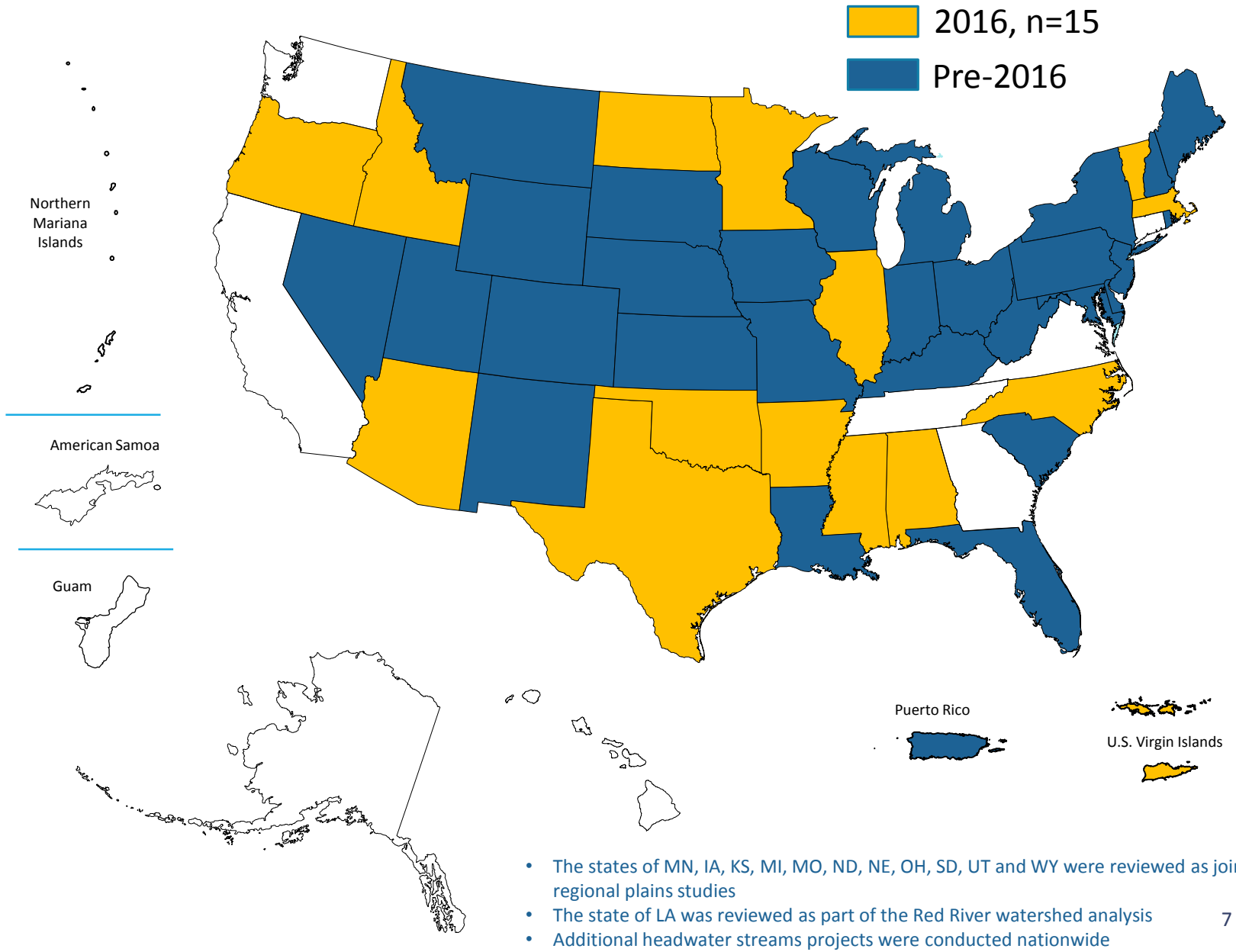


FY16 State N-STEPS Support

Technical support for nutrient criteria development:

- Technical literature reviews
- Data compilation and preparation
- Conceptual modeling
- Classification analysis
- Reference distribution analysis
- Mechanistic modeling
- Stressor-response modeling
- Technical reports

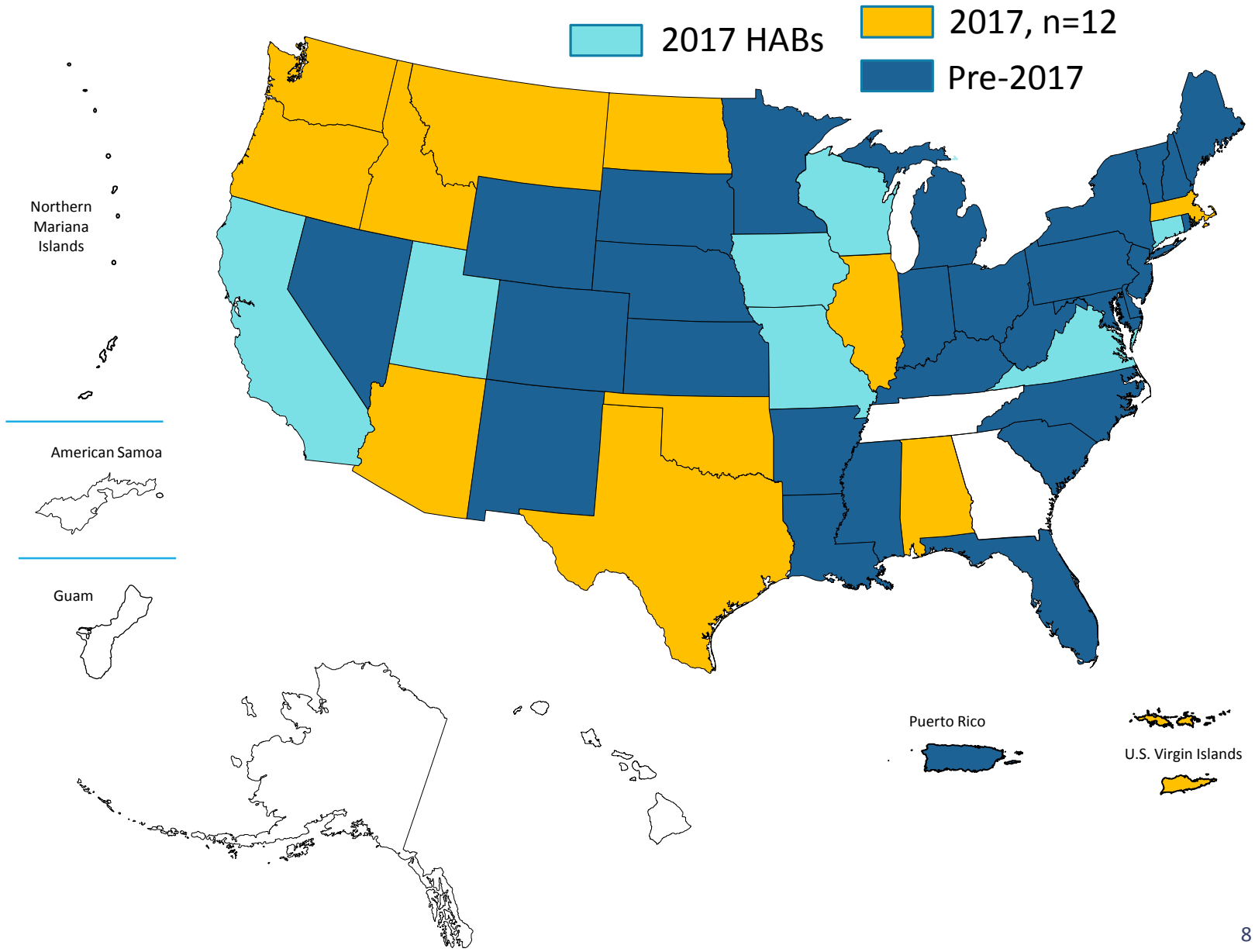
Map of State/Regional Technical Support for State Nutrient Criteria Derivation Projects Completed



- The states of MN, IA, KS, MI, MO, ND, NE, OH, SD, UT and WY were reviewed as joint regional plains studies
- The state of LA was reviewed as part of the Red River watershed analysis
- Additional headwater streams projects were conducted nationwide

State N-STEPS projects in FY17

Map of State/Regional Technical Support for State Nutrient Criteria Derivation Projects Completed



3rd Key Points

- What do we work on or What are we working on?
  - N-STEPS conducts an overview of nutrient and response variables
  - uses available statistical tools, compiled and described models commonly used in nutrient water quality modeling
  - and in addition, uses relevant nutrient literature to make recommendations

Technical Analysis

Massachusetts DEP

- Support for estuarine criteria TSD
- Sample Frame Development
- Literature Review
- Data compilation
- Classification
- Assessment Endpoints
- Conceptual Model
- Helping move estuarine nutrient criteria effort forward

Technical Analysis

Alabama DEM

- Streams
- Nutrient sensitive indicators needed
- Stream invertebrate and fish data
- Nutrient chemistry data
- Sensitive/Tolerant taxa
- Nutrient optima model

Technical Analysis

Oklahoma WRB

- Support for chlorophyll *a* endpoint
- Conceptual models
- Classification
- Major data compilation effort
- Stressor-response analyses
- Results finding chl-a linkages to DO, cyanobacteria, and to zooplankton

State Standard Package Reviews

Minnesota PCA

- River criteria TSD
- Charge Questions
- Three national expert peer reviewers
- Second review – state incorporated first round
- Invertebrate based
- Mixed impressions, general support
- Statistical interpretation

State Standard Package Review

Montana DEQ

- Riverine Criteria TSD
- State and Region Charge Questions
- Three national expert peer reviewers
- Nuisance algal/Chlorophyll a based
- Raised modeling concerns
- State using this to help defend their approach

Outreach and Communication

Technical Webinars

- 4 webinars highlighting a range of technical issues
  - National Lake Criteria
  - Drinking Water Based Criteria
  - Remote Sensing of Water Quality
  - Estuarine Bioindicators
- 400+ invitees/attendees

N-STEPS in FY17

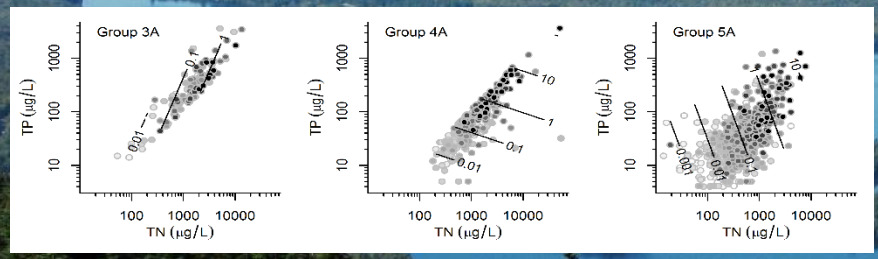
- Technical Support
  - 12 active state projects (8 carry-over from FY16)
    - 4 new FY17 starts – WA (streams), ND (Lake Sakakawea), MT (Yellowstone River), AZ (stream bioassessment program review and nutrient criteria)
  - 1 state in the pipeline (UT)
  - 9 state lake HABs prevention projects (CT, VA, WI, MO, IA, UT, CA, ID, and WA)
- Communication and Outreach
  - N-STEPS Online
  - N-STEPS Circular
  - Webinars on technical topics

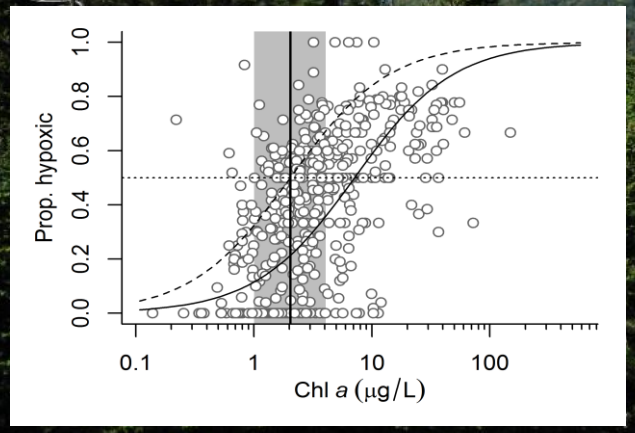
304(a) Lake Criteria Peer Review

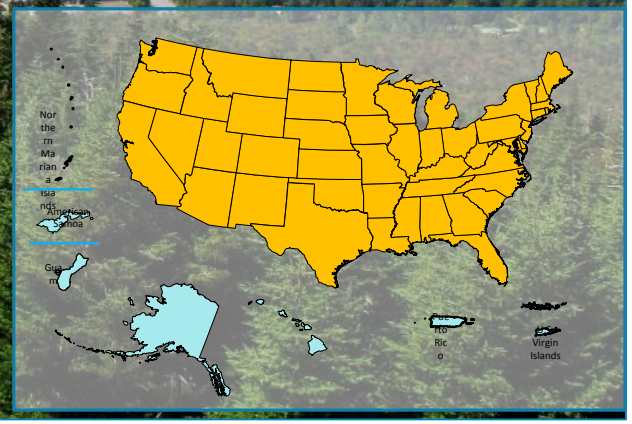
- Lakes national 304(a) criteria document
- Charge questions
- Three national expert peer reviewers
- Review focused on all sections of document
- EPA using to guide revision

National Lakes Document

Numeric nutrient criteria for lakes and reservoirs of the continental United States







Thank You!

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