



Compilation of Presentation Slides and Materials from All National Training Workshops on Water Quality Data, Assessment, and Plans

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CWA 303(d) Program Goals and Policy Implementation

- Overviews
 - [Introduction to the Clean Water Act Section 303\(d\) Program and Vision](#) – Traci Iott (CT) and Rosaura Conde (EPA HQ) [2024]
 - [Introduction to the Clean Water Act Section 303\(d\) Program and Vision](#) – Traci Iott (CT) and Rosaura Conde (EPA HQ) [2023]
 - [CWA 303\(d\) 101](#) – Traci Iott (CT) and Rosaura Conde (EPA HQ) [2022]
 - [Freshman Orientation](#) – Eric Monschein (EPA HQ) [2019]
 - [CWA 303\(d\) Workshop: Key Takeaways](#) – Jim Havard (EPA HQ) [2018]
 - [2013 GAO Report on the TMDL Program](#)
 - [CWA Framework Diagram](#)
- Program Measures
 - [Measuring Progress](#) – Miranda Chien-Hale (EPA HQ) [2019]
 - [Oh the Awesome Work We Will Now Be Able to Show: CWA 303\(d\) Measures "WQ-27 and WQ-28"](#) – Shera Reems (EPA HQ) [2015]
 - [New CWA 303\(d\) Program Measures: Pilot Results](#) – Shera Reems (EPA HQ) [2014]
 - [Measures Sideboards](#) – Tatyana DiMascio (EPA HQ) [2013]
 - [Handout on Guiding Principles and Potential Approaches for Developing New Measure\(s\)](#) [2013]
 - [Template for Metadata Worksheet on Measures \(MN\)](#)
 - [Draft 2013 National Water Program Guidance Measure WQ 26](#)
 - [EPA Strategic Measures](#) [2012]
- CWA 303(d) Vision and Prioritization
 - [Planning and Prioritization: 2022 Vision Prioritization Frameworks](#) – Teagan Rostock (EPA HQ) [2024]
 - [Introduction to the Prioritization and Planning Session](#) – Teagan Rostock (EPA HQ) [2023]
 - [Think Statewide - Act Locally \(Implementing Michigan's Vision 1.0\)](#) – Molly Rippke (MI) [2024]
 - [Utah's Prioritization 2.0: Approach to Protection and Restoration Planning](#) – Jodi Gardberg (UT) [2024]
 - [CWA 303\(d\) Program Vision](#) – Traci Iott (CT) and Rosaura Conde (EPA HQ) [2022]
 - [The Draft CWA 303\(d\) Vision: Materials and Trainings for Implementation](#) – Richard Cochran (TN), Rosaura Conde (EPA HQ), Eric Monschein (EPA HQ), Jasper Hobbs (ACWA) [2022]
 - [The Re-Vision: Draft Recommendations for the 303\(d\) Vision Update](#) – Jeff Berckes (IA), Traci Iott (CT) [2021]
 - [Thoughtful Steps in the Path Ahead: Vision Process](#) – Rosaura Conde (EPA HQ) [2021]
 - [A Description of Louisiana's New Vision Prioritization Process](#) – Chuck Berger (LA) [2021]
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 - [A Long-Term Vision for Assessment, Restoration, and Protection under the Clean Water Act Section 303\(d\) Program](#) [2020]
 - [Wisconsin's Approach to Prioritizing Waters for Restoration Planning](#) – Ashley Beranek and Kevin Kirsch (WI) [2021]

- [The Use of SPARROW and Other Tools to Help Prioritize Wisconsin Watersheds](#) – Ashley Beranek and Kevin Kirsch (WI) [2020]
- [Report-Back and Discussion of Vision Analysis: Summary of the Vision Breakout Discussions](#) [2020]
 - [Handout: Working Draft Protection FAQs \(distributed to all states in November 2018 as part of the protection compendium questionnaire\)](#)
- [Overview of State Prioritization Frameworks](#) – Adam Schempp (ELI) [2016]
- [A Preliminary Conceptual Framework for the CWA 303\(d\) Vision’s Protection Goal](#) – Doug Norton (EPA HQ) [2016]
- [Brief Review of the Integration Goal](#) – Ruth Chemerys (EPA HQ) [2015]
- [CWA 303\(d\) Program Vision Prioritization Goal](#) – Jim Havard (EPA HQ) [2015]
 - [Summary of Responses Received from ACWA CWA 303\(d\) Vision Prioritization Questionnaire](#)
 - [State Prioritization Approaches Directory](#)
 - [WATERSCAPE Factsheet](#)
 - [Recovery Potential Screening Factsheet](#)
 - [Watershed Index Online Summary](#)
 - [National Healthy Watersheds Preliminary Assessment Factsheet](#)
 - [Healthy Watersheds Consortium Grant Factsheet](#)
- [Engaging Monitoring Programs in 303\(d\) Vision Prioritization Discussions](#) – Susan Holdsworth (EPA HQ) [2014]
- [Review of Assessment Goal and Its Milestones](#) – Eric Monschein (EPA HQ) [2015]
- [The Results of the ACWA Watersheds Committee Survey on the CWA 303\(d\) Vision Assessment Goal](#) – Traci Iott (CT) [2015]
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- [Evolution of Clean Water Act Section 303\(d\) Listing and TMDL Program Vision](#) – Eric Monschein (EPA HQ) [2012]
- [Prioritizing Waters in Florida](#) – Julie Espy & Greg DeAngelo (FL) [2014]
- [Factors to Consider for Priority Setting](#)
- [Tools to Aid Prioritization](#)
- [Maryland Chesapeake and Coastal Bays Trust Fund: SFY12 Priority Areas \(MD\)](#)
- [Concepts in Water Quality Trend Analysis \(VA\)](#)
- [Gantt Chart on How Different Milestones for All Goals Fit Together, from 2012 to 2022](#)
- [Conceptual Approach for a State TMDL Vision Strategy \(KS\)](#)
- [Sample State Perspective Timeline of 303\(d\) Listing and TMDL Program Drivers, Activities, Strategy, and Measures \(KS\)](#)

Monitoring and Assessment

- Monitoring: General
 - [Water Quality Monitoring](#) – Sarah Lehmann (EPA HQ) [2018]
 - [Elements of a State Water Monitoring and Assessment Program](#) – Susan Holdsworth (EPA HQ) [2015]
 - [Waterbody Monitoring with Machine Learning Modeling](#) – Britta Bierwagen (EPA HQ) [2024]
 - [Lessons and Approaches from Regional Monitoring Network Sites](#) – Britta Bierwagen (EPA HQ) [2024]
 - [State-Scale Probability Surveys: An Overview](#) – Garrett Stillings (EPA HQ) [2022]
 - [USEPA/OW Survey Design Tool](#)
 - [USEPA/NARS Population Estimate Shiny Tool](#)
 - [Integration of NY's Monitoring Program into NY's Vision Approach](#) – Ken Kosinski (NY) [2016]
 - [Registration Responses Regarding Monitoring](#) – Adam Schempp (ELI) [2016]
 - [Information about National Aquatic Resource Surveys and State Scale Statistical Surveys](#) [2013]
 - [Virginia's Freshwater Probabilistic Monitoring Program \(VA\)](#)
 - [Fact Sheet on CWA Section 106 Monitoring Initiative](#)
- Participatory Science
 - [Participatory Science and Managing for External Data](#) – Adam Griggs (EPA HQ) [2024]
 - [Alabama Water Watch](#) – Jennifer Haslbauer (AL) [2024]
 - [Volunteer Water Monitoring Program](#) – Waverly Reibel (MN) [2024]
 - [Volunteer Water Monitoring Program Website](#)
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 - [The Value of Citizen Volunteer Data](#) – James Beckley (VA) [2019]
 - [Colorado River Watch - Citizen Science Data Used in Decision Making](#) – Holly Brown (CO) [2019]
 - [The Water Data Collaborative: Empowering Community Water Science](#) – Adam Griggs (River Network) [2019]
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 - [Arizona Water Watch Volunteer Data Process](#) – Meghan Smart (AZ) [2022]
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 - [The Role of Citizen Science in Nutrient TMDL Development for Sanibel Slough](#) – Ansel Bubel (FL) [2018]
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- R
 - [R Script for Uploading NC Assessments to ATTAINS](#) – Bongghi Hong (NC) [2023]
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 - [Arizona's Assessment: Leveraging R for an End-to-End Solution](#) – Mackenzie Moore (AZ) [2023]
 - [Processing Benthic Macroinvertebrate Data in R](#) – Emma Jones (VA) [2019]
 - [Automated Assessment: Managing Large Data Sets with R](#) – Jack Pflaumer (NJ) [2018]
- Assessment Unit Segmentation Practices
 - [Redefining Segmentation](#) – Lesley Merrick (OR) [2021]
 - [AU Re-segmentation in Utah](#) – Elise Hinman (UT) [2021]
 - [West Virginia's Redesign of their Assessment Units](#) – Chris Daugherty (WV) [2021]
- Stressor Identification
 - [Kentucky's Casual Analysis for Assessing Waters with Narrative Criteria: A More Informed and Reproducible Approach](#) – Katie McKone and Nick Reif (KY) [2024]
 - [Maryland Biological Stressor Identification Process](#) – Becky Monahan and Bel Martinez da Matta (MD) [2024]
 - [Biological Assessment Methodology for Non-Tidal Wadeable Streams](#)
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 - [Stressor Identification for Impaired Streams in Mississippi](#) [2019]
 - [Stressor ID: An Illustration](#) [2019]
 - [Rapid Causal Assessment](#) – Sue Norton (EPA HQ) [2018]
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- Assessment: General
 - [The Basics of Assessment: Considerations for Analyzing Data such as Quality Assurance, Finding Readily Available Data to Supplement Analysis, and Comparing Data against Criteria](#) – Laura Shumway (EPA HQ), Selena Medrano (EPA R6) [2022]
 - [All of the Modules and Exercises](#)
 - [Data Assessment for CWA 303\(d\) Listing in South Carolina](#) – Wade Cantrell (SC) [2016]
 - [Status of 2010 and 2012 Integrated Reports - Attribute Data](#)
 - [Status of 2010 and 2012 Integrated Reports - GIS](#)
- Assessment Methods for Aquatic Life Use Impairment
 - [Aquatic Life Use in Ohio: Ohio's Tiered Biological Criteria](#) – Sarah Becker (OH) [2020]
 - [Handout: Ohio EPA Aquatic Life Use–Biological Criteria](#)
 - [The Biological Condition Gradient \(BCG\)](#) – Susan Jackson (EPA HQ) [2020]
 - [BCG Handout 1: Biological and Other Ecological Attributes Used to Characterize the BCG](#)
 - [BCG Handout 2: Coral Reef Benthic BCG Model–Draft](#)
 - [BCG Handout 3: What Constitutes the Final BCG Model?](#)
 - [Large River Semi-wadeable Multimetric Index \(SWMMI\)](#) – Dustin Shull (PA) [2020]

- [Environmental DNA: Method Development and Applications in Region 3](#) – Amy Bergdale (EPA R3) [2020]
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TMDL Process

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 - [Washington State's TMDL Template](#) – Ben Rau (WA) [2024]
 - [TMDL Prioritization, Public Process, and Streamlining](#) – Erin Rasnake (FL) [2017]
 - [TMDL Calculators Facilitate Allocation](#) – Wade Cantrell (SC) [2017]
 - [Arizona's Use of R for TMDL Automation](#) – Mikayla Baker (AZ) [2023]
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 - [“Reasonably Sure” that Good Things Will Happen: Ohio’s Olentangy TMDL](#) – Trinkka Mount (OH) [2011]
 - [Olentangy River Watershed TMDL Report](#)
 - [Demonstrating Reasonable Assurance in Idaho TMDLs: Fact, Fiction & Warm Fuzzies](#) – Marti Bridges (ID) [2011]
 - [Relevant texts in statute, regulations, and guidance pertinent to reasonable assurance](#) [2011]
 - [Lake Champlain Phosphorus TMDL Disapproval Decision](#) [2011]
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 - [Friends of Pinto Creek v. US EPA](#) [2007]
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 - [West Virginia’s Watershed Approach](#) – James Summers (WV) [2008]
 - [Elements of an Effective State TMDL Program: Overcoming Internal Obstacles](#) – Heidi Henderson (NM) [2008]
 - [Balancing State Resources for TMDL Development: Pace, Rigor & Expectations](#) – Tom Stiles (KS) [2008]
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 - [Developing TMDLs in Ways that Lead to More Seamless Collaboration and Implementation](#) – Kevin Kirsch (WI) [2024]
 - [Finding the Path Forward to TMDL Implementation](#) – Heather Husband (ND) [2021]
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- [It Takes More than a Good TMDL to Get to TMDL Implementation](#) – Helen Bresler (WA) [2009]
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- [TMDL NPS Implementation in Maryland](#) – Jim George (MD) [2009]
- [Regulating \(or not\) NPS in North Carolina](#) – Kathy Stecker (NC) [2009]
- [TMDL Implementation in Oregon: Leveraging Resources to Meet Enforceable Requirements](#) – Michael J. Wolf (OR) [2009]
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- Evaluating Effectiveness
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 - [Performance Monitoring for TMDLs and Alternatives in Indiana](#) – Angie Brown (IN) [2022]
 - [Ecology’s Effectiveness Monitoring Program](#) – Scott Collyard (WA), Ben Rau (WA) [2022]
 - [Nonpoint Source Monitoring Objectives and Basic Designs](#) – Cyd Curtis (EPA HQ), Paul Thomas (EPA R5) [2022]
 - [Monitoring TMDL Effectiveness](#) – Robert Voss (MS) [2023]
 - [Evaluating TMDL Effectiveness](#) – Brian Barnes (NE) [2023]
 - [Tracking Restoration Progress in Maryland](#) – Sophia Grossweiler (MA) [2023]
 - [Using Limiting Factors to Overcome the Problem of Long Time Horizons in Evaluation](#) – Jared Hardner (Hardner & Gullison Associates) [2020]
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 - [Using Probabilistic Monitoring to Assess the Effectiveness of Stream Management Efforts](#) – Larry Willis (VA) [2016]
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 - [State of Oregon Experience](#) – James Bloom (OR) [2022]

- [Updating TMDLs in Texas Through the WQMP Process](#) – Kerry Niemann (TX) [2021]

Advance Restoration Plans

- [Understanding the Different Types of Plans Available for the CWA 303\(d\) Program: What Are My Options?](#) – Amy Feingold (EPA R4), Chris Hunter (EPA HQ) [2021]
 - [Handout: References for Understanding the Different Types of Plans Available for the CWA 303\(d\) Program](#)
- [Alternative Restoration Plans](#) – Amy Feingold (EPA R4), Chris Hunter (EPA HQ) [2021]
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- [An Update and Overview of Advance Restoration Plans \(ARPs\)](#) – Chris Hunter (EPA HQ) [2023]
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- [Mystic River Alternative TMDL](#) – Matthew Reardon (MA) [2023]
- [The Mystic River Watershed Alternative TMDL](#) – Patrick Herron (Mystic River Watershed Association), Ivy Mlsna (Region 1), Laura Schiffman (MA) [2021]
- [Great Pond Advance Restoration Plan \(ARP\)](#) – Tracy Krueger (ME) [2023]
- [Notes on Tennessee’s 5-alt Approach](#) – David Duhl (TN) [2018]
- [Kishacoquillas Creek Alternative Restoration Plan One-Pager](#) – Scott Heidel (PA) [2018]
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- [The Bad Axe Creek TMDL/WMP Hybrid](#) – Molly Rippke (MI) [2017]
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 - [2016 Integrated Report Memorandum](#)
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- [Region 6 Coordination on Reviewing NPS-only Watershed Plans as Category 5-Alternatives](#) – Richard Wooster (EPA R6) [2016]
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- [Examples of Emerging or Potential Opportunities to Incorporate Alternatives into the CWA 303\(d\) Program](#)
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- [“Straight to Implementation” – A TMDL Alternative](#) – Helen Bresler (WA) [2008]

Protection

- ["An Ounce of Protection is Worth a Pound of Cure": Advancing Watershed Protection in the CWA 303\(d\) and 319 Programs](#) – Miranda Chien-Hale and Elise Turrietta (EPA HQ), Kati Carberry (EPA R10) [2024]
- [A Dollar? Acre? Pound? of Protection a Day, Keeps the 303\(d\) List Away: Evaluating Progress Towards Protecting Waters](#) – Steve Epting (EPA HQ) [2020]
- [Protection Planning in 303\(d\) Program: Examples from Connecticut](#) – Traci Iott (CT) [2024]
- [Protection Plans in Texas](#) – Nicole Hall (TX) [2024]
- [Protection TMDLs in Kansas](#) – Dane Boring (KS) [2023]
- [Integrated Protection Within Watershed-Based Planning](#) – Steve Epting (EPA HQ) [2023]
- [Advancing Water Quality Through Land Protection: Lessons from the Delaware River Watershed Initiative](#) – Abigail Weinberg (Open Space Institute) [2023]
 - [Delaware Initiative Website](#)
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 - [OSI's approach to selecting watersheds for protection](#)
- [Protection of Downstream Water Quality Standards in Washington](#) – Jeremy Reiman (WA) [2023]
- [Lake Talquin TMDL: Protecting Downstream Designated Uses](#) – Elizabeth A. Booth (GA) [2023]
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- [New York's TMDL Strategies to Protect Downstream Waters](#) – Andrea Conine and Cassandra Davis (NY) [2023]
- [Protection Updates](#) – Miranda Chien-Hale (EPA HQ), Steve Epting (EPA HQ), Sequoya Bua-lam (ORISE Fellow at EPA HQ), Ashley Beranek (WI) [2021]
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Collaboration and Integration

- Across Multiple Programs/Agencies
 - [Planning Across CWA Programs](#) – Rosaura Conde (EPA HQ) [2024]
 - [Cross Program Coordination: A Year in the Life of a State's Environmental Programs](#) – Traci Iott (CT) [2024]

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 - [Water Quality Standards Regulatory Revisions \(Final Rule\)](#)
- Nonpoint Source Program
 - [Coordination Between the CWA 303\(d\) and Nonpoint Source Programs](#) – Cyd Curtis and Justin Drew (EPA HQ) [2024]
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 - [Strengthening CWA Section 319 Nonpoint Source Program](#) – Lynda Hall (EPA HQ) [2012]
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- [Water Quality Management on National Forest System Lands](#) – Joan Carlson (USFS) [2009]
- NPDES Permitting Program
 - [Overview of CWA 303\(d\) Program Integration Efforts with NPDES](#) – Jenny Molloy (EPA HQ), Cindy Lin (EPA R9) [2015]
 - [Assisting MS4 Permittees with WLA documentation](#) – Andrea Plevan (MN) [2024]
 - [Blue Earth River Watershed TMDL Report](#)
 - [Guidance and Examples for Using the MPCA Estimator](#)
 - [MS4s and TMDLs: North Carolina’s Approach](#) – Kathy Stecker (NC) [2011]
 - [Permitting and the CWA 303\(d\) Program in Florida](#) – Greg DeAngelo and Erin Rasnake (FL) [2020]
 - [Handout: Request for DEAR Review and Input Guide \(FL\)](#)
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 - [Interfacing Nutrient TMDLs with NPDES or “After 6 Years of the Vision, How the Hell Did We Miss This?”](#) – Tom Stiles (KS) [2018]
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