Framework of The Clean Water Act

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This Presentation will cover...

- Overview of Clean Water Act (CWA) restoration framework
  - water quality standards
  - monitoring/assessment
  - reporting water quality status
  - TMDL development
  - TMDL implementation (point & nonpoint source control)
The Clean Water Act

- **Objective:** “restore and maintain the chemical, physical and biological integrity of the Nation’s waters”

- **Interim goal:** “water quality which provides for the protection and propagation of fish, shellfish and wildlife and provides for recreation in and on the water,” whenever attainable (Sec 101(a)(2))
Clean Water Act Restoration Framework

- Defines the water quality goal
  - Adopt Water Quality Standards

- Compile data/information and assess waterbody condition
  - Monitor and Assess Waters
  - List Impaired & Threatened Waters
  - Develop TMDLs (TMDL=WLA+LA+MOS)

303(d) Program
40 CFR 130.7

Implementation

- Control Point Sources Via NPDES Permits
- Manage Nonpoint Sources Through Grants, Partnerships, and Voluntary Programs
- Trading
Water Quality Standards (WQS)

• Establish **water quality goals for a waterbody**

• **General process:**
  – States/tribes adopt
  – EPA reviews/approves
  – If EPA disapproves & state/tribe does not adopt specific changes, EPA promulgates a replacement standard
WQS Components

- Designated Uses
- Criteria (narrative or numeric)
- Anti-degradation Policy

Implementation Procedures

Waters of the United States
Designated Uses

• A statement of the management objectives and expectations for each of the individual surface waters under state/tribal jurisdiction

• Examples:
  – Protection and propagation of fish, shellfish and wildlife
  – Recreation in and on the water
  – Public water supply
  – Agriculture
  – Industry
  – Navigation
Water Quality Criteria

• A **numeric** value (e.g., magnitude, duration, frequency) or **narrative** statement

• Examples:
  – Numeric: 10mg/L [mag.], 4-day avg [dur.], once in three years [freq.]
  – Narratives: no toxics in toxic amounts, no visible sheen

• Represents level of water quality that supports a particular designated use

• When criteria are met, water quality will protect the designated use
Antidegradation Policies

- Maintain and Protect Water Quality for Outstanding National Resource Waters
- Higher Quality Water Protection
- Existing Uses and WQ to Maintain Them
Use

Attainability Analysis (UAA)

40 CFR 131.10(g)

– May be conducted to modify or remove a designated use
– Involves determining the feasibility of attaining the use in the future
– State/Tribe initiated adoption of any new or revised water quality standards
Monitoring/Assessment

• State/tribe driven process; no general federal CWA monitoring requirements on what, where, or how

• EPA Support (www.epa.gov/owow/monitoring)
  – CWA Section 106 grant funds
  – Monitoring guidance
  – National probability surveys

• Objective – determine water quality attainment status (i.e., are designated uses being met?)
Reporting Water Quality Status

- State’s submit to EPA by April 1 every even numbered year:
  - CWA Section 305(b) report
    - water quality status of all waters in the state
    - EPA reviews, but does not approve report
    - EPA consolidates state reports into one national 305(b) report to Congress
  - CWA Section 303(d) list
    - waters “impaired” or “threatened” by a “pollutant” & needing a Total Maximum Daily Load [TMDL]
    - EPA reviews & approves list, or may add waters to the list
Reporting Water Quality Status (cont.)

• Section 303(d) list also includes:
  – Description of assessment methodology
  – Description of data/info used to develop list
  – Description of rationale for not using data
  – “Pollutants” causing the impairment
  – Priority ranking for TMDL development (w/in 2 yrs)
EPA’s Integrated Reporting Guidance

• Introduced for 2002 reporting cycle

• Promoted integrating the reporting requirements of Section 303(d) list with Section 305(b) report

• Goal – uniform assessment and reporting of water quality status of all waters in a state via EPA’s recommended five “Reporting Categories” →
## Five Reporting Categories

( >75% of States now using Integrated Report format )

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>All designated uses (DU) met</td>
</tr>
<tr>
<td>2</td>
<td>Some, but not all, DUs met</td>
</tr>
<tr>
<td>3</td>
<td>Can not determine if any DUs met</td>
</tr>
<tr>
<td>4</td>
<td><strong>Impaired/threatened</strong> – TMDL not needed</td>
</tr>
<tr>
<td>4a</td>
<td>TMDL completed</td>
</tr>
<tr>
<td>4b</td>
<td>TMDL alternative</td>
</tr>
<tr>
<td>4c</td>
<td>Non-pollutant causes</td>
</tr>
<tr>
<td><strong>5</strong></td>
<td><strong>Impaired/threatened</strong> by pollutant – TMDL needed</td>
</tr>
</tbody>
</table>
Category 4b

• TMDL not needed when other controls will lead to meeting WQS in a reasonable period of time

• Examples
  – NPDES permit
  – CERCLA/RCRA remediation
  – Detailed local watershed management plans w/ adequate funding & assurances

• Less used portion of 303(d) program
  – 400 4b’s vs. 47,000 TMDLs

• EPA working with states and other stakeholders (e.g., Forest Service) to identify Category 4b opportunities
National Picture of Water Quality Assessments (2002 305(b) Report)

Figure 1. Water quality in assessed river and stream miles.
- Total Streams: 3,692,830 Miles
  - 81% Unassessed
  - 19% Assessed
    - 923,340 Miles
  - Assessed Streams: 923,340 Miles
- 4% Good but Threatened: 27,750 Miles
- 51% Good
- 45% Impaired

16% (2004)

Figure 2. Water quality in assessed lake acres.
- Total U.S. Lakes: 40.6 Million Acres
  - 63% Unassessed
  - 37% Assessed
    - 14,831,882 Acres
  - Assessed Lakes: 14,831,882 Acres
  - 5% Good but Threatened: 810,775 Acres
- 48% Good
- 47% Impaired

39% (2004)

Figure 3. Water quality in assessed bay and estuary square miles.
- Total U.S. Bays & Estuaries: 87,370 Square Miles
  - 65% Unassessed
  - 35% Assessed
    - 30,440 Square Miles
  - Assessed Bays & Estuaries: 30,440 Square Miles
- 66% Good
- 32% Impaired
- 2% Good but Threatened: 694 Square Miles

29% (2004)

National Water Quality Inventory Report to Congress: http://www.epa.gov/305b/
## Section 303(d) List Stats

- Over 40,000 listed segments, with one or more impairments
- Over 71,000 waterbody-pollutant combinations reported
- Sources of impairment:
  - 45-55% blended
  - 40-50% nonpoint
  - 5% point

<table>
<thead>
<tr>
<th>Top causes of impairment</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>– Pathogens</td>
<td>15%</td>
</tr>
<tr>
<td>– Metals (other than Mercury)</td>
<td>10%</td>
</tr>
<tr>
<td>– Nutrients</td>
<td>10%</td>
</tr>
<tr>
<td>– Low Dissolved Oxygen</td>
<td>9%</td>
</tr>
<tr>
<td>– Sediment</td>
<td>9%</td>
</tr>
<tr>
<td>– PCBs</td>
<td>8%</td>
</tr>
<tr>
<td>– Mercury</td>
<td>5%</td>
</tr>
</tbody>
</table>

Source: epa.gov/owow/tmdl (accessed on 2/11/11)
What is a Total Maximum Daily Load (TMDL)...

A calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant’s sources.

* The TMDL comes in the form of a technical document or plan.
TMDL Calculation

$$\text{TMDL} = \Sigma \text{WLA} + \Sigma \text{LA} + \text{MOS}$$

$\Sigma \text{WLA}$: Sum of waste load allocations (point sources)

$\Sigma \text{LA}$: Sum of load allocations (nonpoint sources)

MOS: Margin of Safety

*Completed for each waterbody/pollutant combination*
Concentrated Animal Feeding Operation (CAFO)
Livestock
Forest land
Agricultural lands

Nonpoint sources do not need NPDES permits
Total Maximum Daily Loads (TMDLs)

For waters identified on the 303(d) list:

- “TMDLs shall be established for all pollutants preventing or expected to prevent attainment of water quality standards…”

- “TMDLs shall be established at levels necessary to attain and maintain the applicable narrative and numerical WQS…” Regulations (40 CFR 130.7)

• No statutory or regulatory timeframe for TMDL development

- EPA guidance establishes 8-13 year time frame from time of initial listing
TMDL Development Process

1. Problem Identification
   - TMDL Numeric Targets (WQS)

2. Pollutant Source/Load Assessment

3. Linkage Between Pollutant Loading and In-Stream Response

4. Allocation Analysis

5. Monitoring
   - Implementation

TMDL = WLA + LA + MOS
TMDLs are expressed as...

- Mass (e.g., pounds per day)
- Toxicity (e.g., toxic units)
- Energy (e.g., heat in temperature TMDLs)
Elements of a Typical TMDL Document

- Identification of Waterbody, Pollutant of Concern, Pollutant Sources, and Priority Ranking
- Applicable WQS & Numeric Water Quality Target
- Loading Capacity
- Load Allocations and Waste Load Allocations
- Margin of Safety
- Consideration of Seasonal Variation
- Reasonable Assurance for PS/NPS
- Monitoring Plan to Track TMDL Effectiveness
- Implementation Plan
- Public Participation

(blue = required)
TMDL Process

• States develop TMDLs, EPA reviews/approves

• In some cases, EPA establishes the TMDL

• Public/stakeholder role in TMDL Process:
  – Provide data and information to the states
  – Review and comment on draft TMDLs
  – Assist in the development of 3rd party TMDLs
Majority of 47,000 TMDLs (by most common pollutant types)

<table>
<thead>
<tr>
<th>Causes of Impairment</th>
<th>Approved TMDLs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pathogens</td>
<td>6000</td>
</tr>
<tr>
<td>Mercury</td>
<td>8000</td>
</tr>
<tr>
<td>Metals (other than Hg)</td>
<td>2000</td>
</tr>
<tr>
<td>Sediment</td>
<td>4000</td>
</tr>
<tr>
<td>Nutrients</td>
<td>2000</td>
</tr>
<tr>
<td>Oxygen Depletion</td>
<td>1200</td>
</tr>
</tbody>
</table>

Majority of 47,000 TMDLs (by most common pollutant types)
TMDL Implementation

- **TMDLs not self implementing** under 303(d)

- **Point Sources:**
  - Permit limits consistent with WLA are enforceable under CWA through National Pollutant Discharge Elimination System (NPDES)
  - Issued by EPA or States w/delegated authority

- **Nonpoint Sources:**
  - No federal regulatory permit/enforcement program
  - Primarily implemented through State/local NPS management programs (few w/regulatory enforcement) and federal land management agency BMP programs
Useful CWA and TMDL Websites

- The Watershed Academy’s online module “Introduction to the Clean Water Act”
  http://cfpub.epa.gov/watertrain/

- The EPA TMDL Website
  http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/

- ATTAINS online impaired waters data system
  http://epa.gov/waters/ir/