

Addressing 303(d) Listed Waters through Total Maximum Daily Loads

Presenter: EPA Region 9 Staff

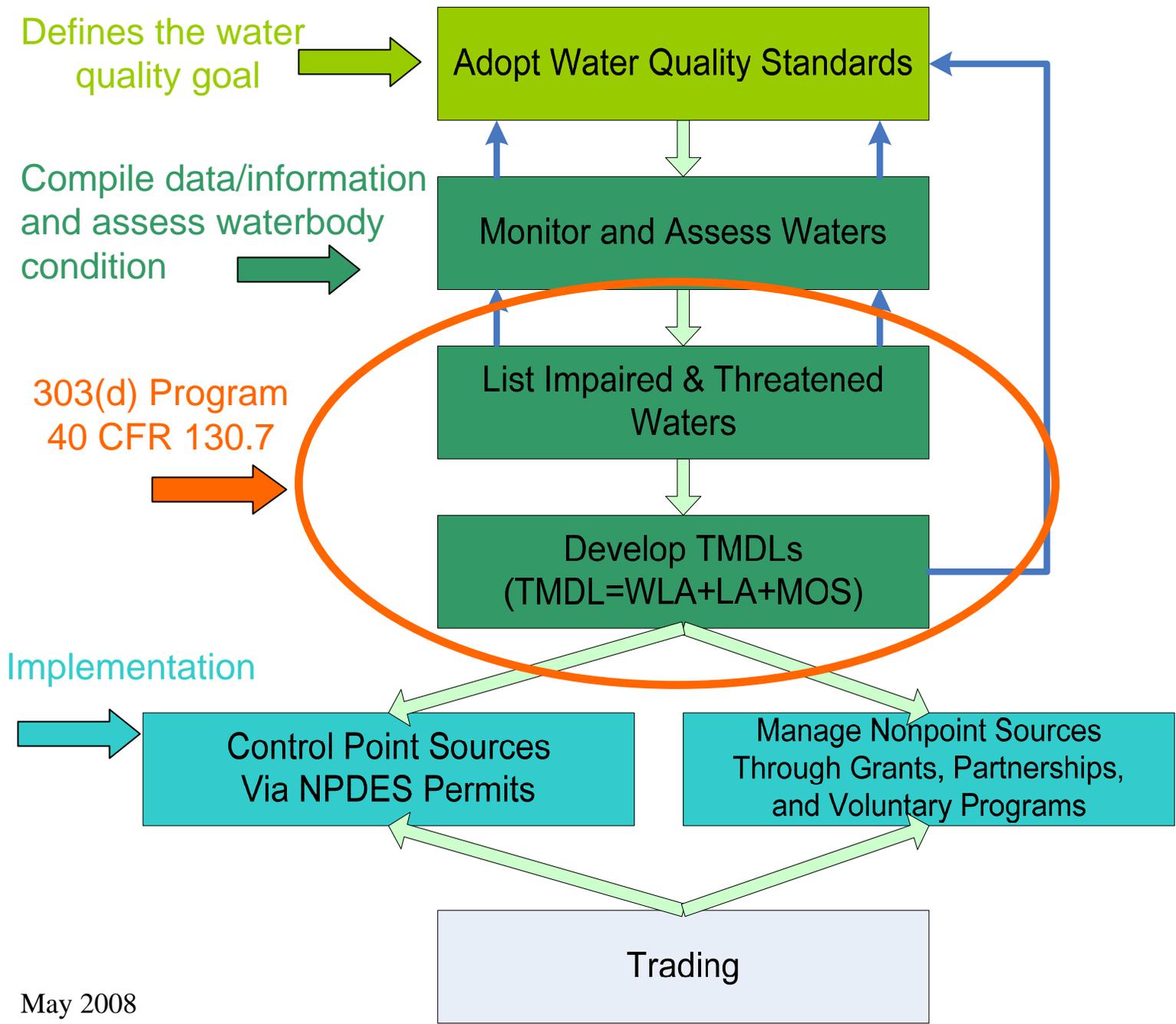
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303(d) Listing & TMDLs

- Objectives of this module:
 - Present a brief overview of CWA Section 303(d)
 - Discuss process of identifying impaired waters
 - Describe State reporting & submission options
 - Define Total Maximum Daily Loads (TMDLs)
 - Discuss process to develop TMDLs
 - List required elements of a TMDL submission
- Questions



WATER QUALITY STANDARDS

...what we're aiming for



Regulations (40 CFR 130.7)

Each State shall identify those water quality-limited segments still requiring TMDLs within its boundaries for which:

- Technology based effluent limitations
- More stringent effluent limitations
- Other pollution control requirements

Are not stringent enough to implement any water quality standards applicable to such waters

Regulations (40 CFR 130.7)

For waters identified in the 303(d) list:

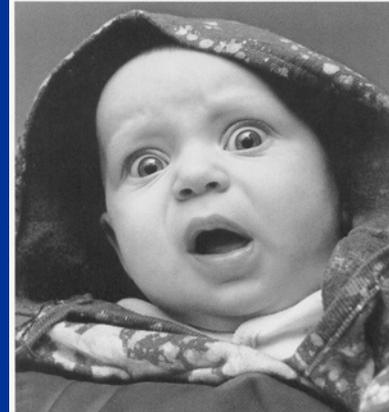
- “TMDLs shall be established for all *pollutants* preventing or expected to prevent attainment of water quality standards...”
- “TMDLs shall be established at levels necessary to attain and maintain the applicable narrative and numerical WQS...”



No statutory or regulatory timeframe for TMDL development

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

Pollutant



“Means dredged spoil, solid waste, incinerator residue, filter backwash, sewage sludge, munitions, chemical wastes, biological materials, (some) radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water.”

(CWA Sec. 502(6))

State Options for Reporting WQ Status

Minimally
Required by
Regulations

Recommended
Reporting
Format

Separate 305(b) & 303(d)

Integrated Report

A State's Section 303(d) list is comprised of waters impaired or threatened by a pollutant, and needing a TMDL

A single state developed report that integrates the reporting requirements of CWA Sections 303(d), 305(b) and 314

States submit their 303(d) list to EPA for review/approval **April 1, every 2 years** (2006, 2008, etc).

EPA's Integrated Report Guidance (IRG) developed for 2002, 2004, 2006 and 2008 reporting cycles
(www.epa.gov/owow/tmdl/)

Reporting

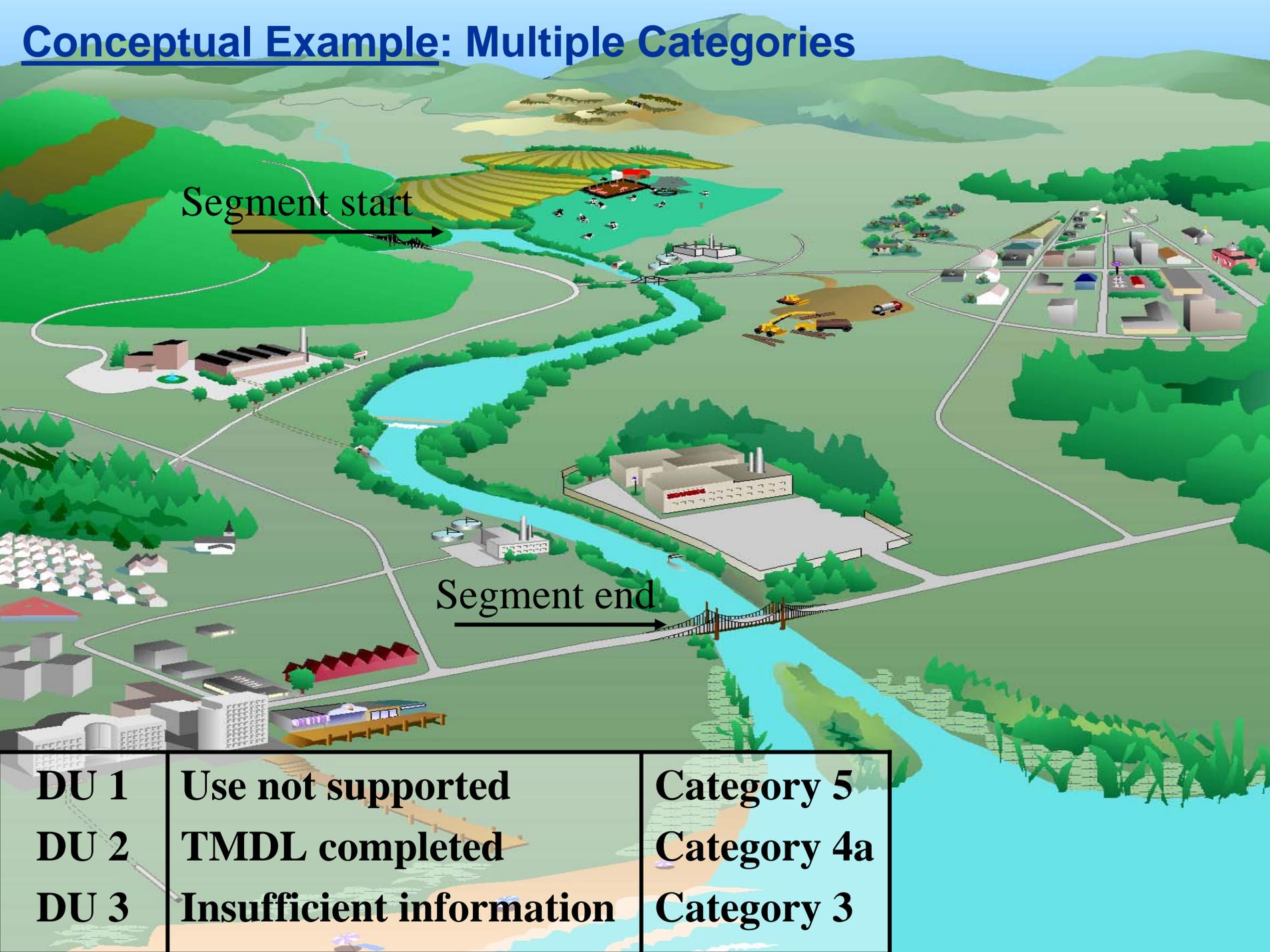
Five Reporting Categories

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



Section 303(d) List

Conceptual Example: Multiple Categories



Segment start



Segment end



DU 1

Use not supported

Category 5

DU 2

TMDL completed

Category 4a

DU 3

Insufficient information

Category 3

Listing of Impaired Waters

State driven
process

1. States identify waters not meeting WQS based on “*all existing and readily available information*”
2. States establish priorities for TMDL development
3. States develop schedule of TMDLs to be developed within 2 years
4. States provide long term plan – complete TMDLs 8 to 13 years from first listing
5. EPA has 30 days to approve or disapprove list submitted April 1st of each even year
 - If EPA disapproves State list, EPA has 30 days to develop list for the State

National Picture of Water Quality Assessments (2002 305(b) Report)

Figure 1. Water quality in assessed river and stream miles.

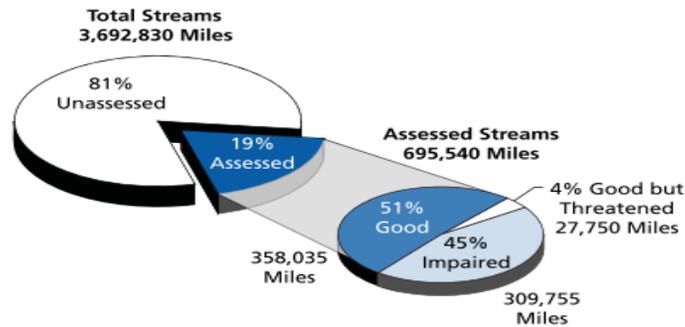


Figure 2. Water quality in assessed lake acres.

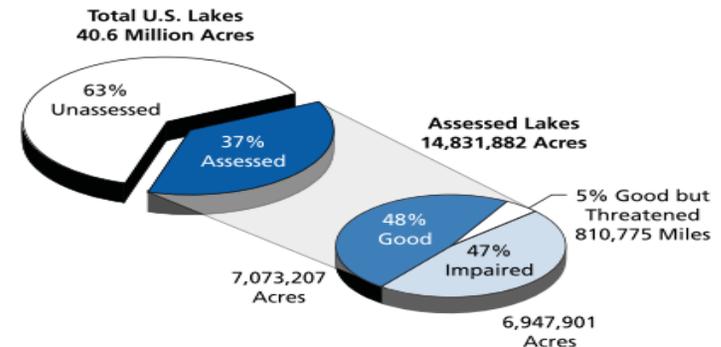
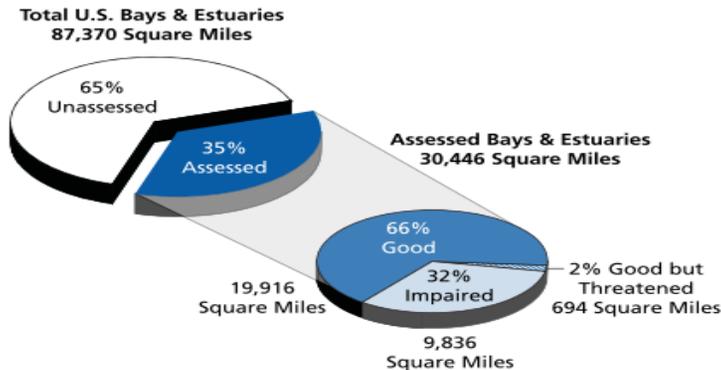


Figure 3. Water quality in assessed bay and estuary square miles.



Most of the waters that are characterized as *impaired* in the 305(b) report should be on the 303(d) list of impaired waters.

Listing of Impaired Waters

- Over 39,000 listed segments, with one or more impairments
- Approximately 65,000 waterbody-pollutant combinations reported
 - Indication of TMDLs that will need to be completed
- Top 5 causes of impairment (updated March, 2008)
 - Pathogens: 14%
 - Mercury: 14%
 - Metals (other than Mercury): 10%
 - Sediment : 10 %
 - Nutrients: 9%
 - Low dissolved oxygen: 8%



Before we continue with TMDLs...

Any Questions?

What is a 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

$$\text{TMDL} = \sum \text{WLA}_i + \sum \text{LA}_i + \text{MOS}$$

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

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

MOS: Margin of Safety

Completed for each waterbody/pollutant combination

Point Sources



Pipe



Concentrated Animal Feeding Operation (CAFO)



Ditch/Conveyance

Nonpoint Sources



Nonpoint sources do not need NPDES permits.

TMDL Calculation

Margin of Safety:

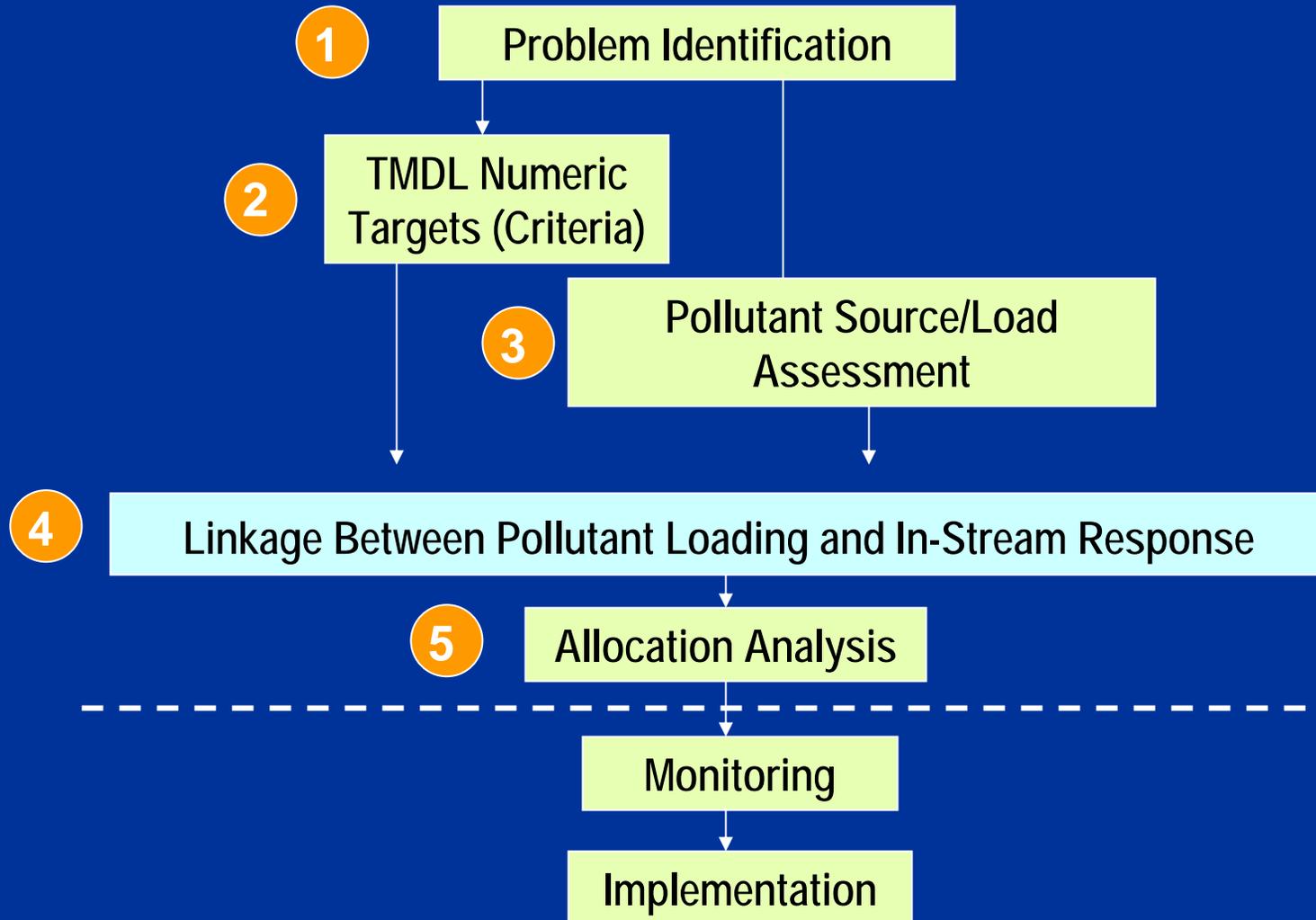
- Takes into account *lack of knowledge* concerning the relationship between effluent limitations and water quality
- Can be *explicit* (e.g., 10%) or *implicit* (conservative assumptions in modeling, etc.)

Margin of Safety Made Simple

“There are *known knowns*. These are things we know that we know. There are *known unknowns*. That is to say, there are things that we know we don't know. But there are also *unknown unknowns*. There are things we don't know we don't know.”

Donald Rumsfeld

TMDL Development Process



Task 1: Problem Identification

The TMDL submittal should:

- Identify the waterbody as it appears on the State's/Tribe's 303(d) list.
 - Waterbody should be identified/georeferenced using the National Hydrography Dataset (NHD)
- Identify the pollutant for which the TMDL is being established.

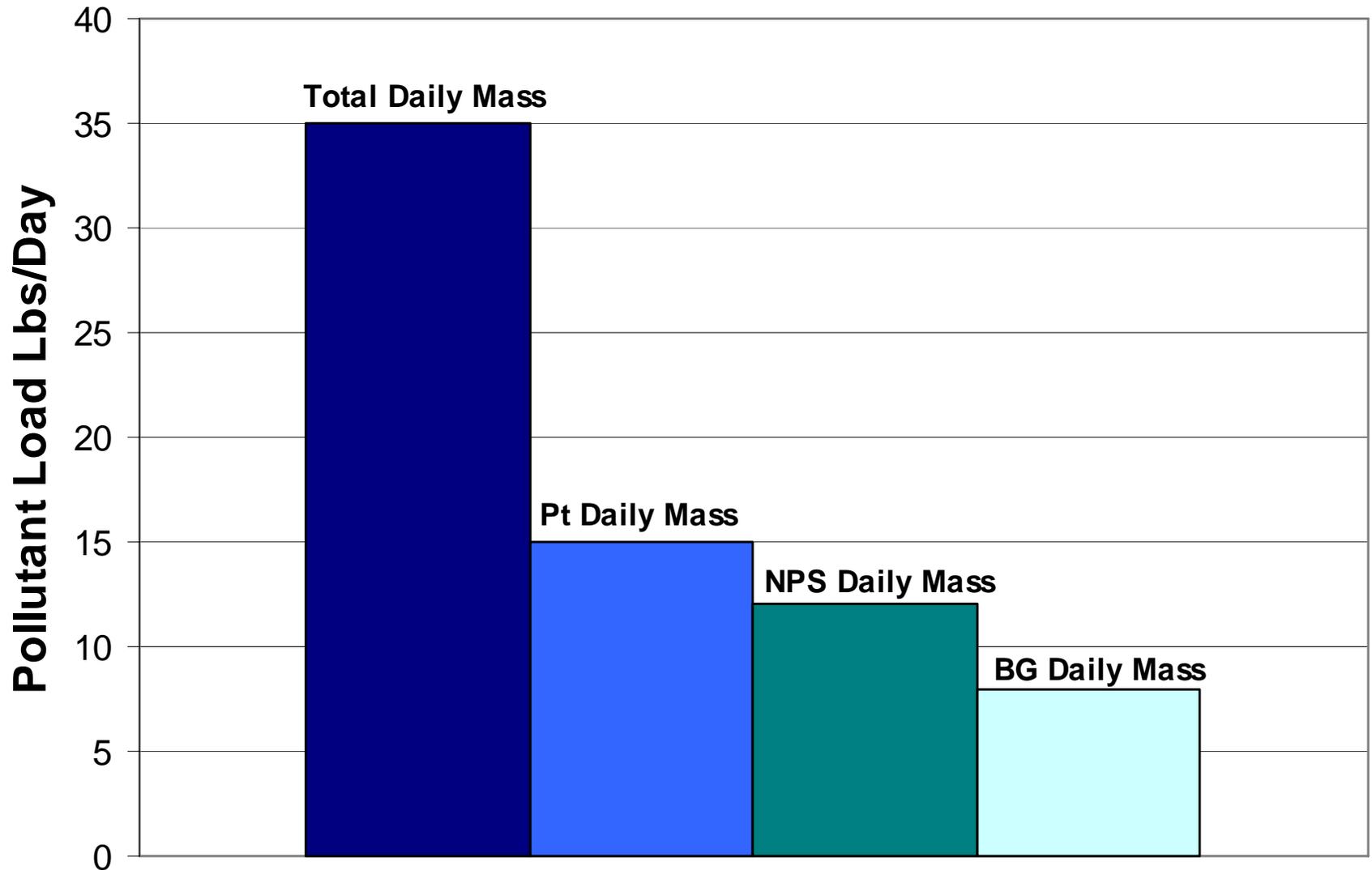
Task 2: Set Target for TMDL

- The TMDL submittal must identify a numeric water quality target(s) - a quantitative value used to measure whether or not the applicable water quality standard is attained.
- The TMDL expresses the relationship between any necessary reduction of the pollutant of concern and the attainment of the numeric water quality target.
- If water was listed using a narrative WQC, then select an indicator as surrogate quantitative target.

Task 3: Pollutant Source/Load Assessment

- Include an identification of the point and nonpoint sources of the pollutant of concern, including location of the source(s) and the quantity of the loading.
 - Provide the identification numbers of the NPDES permits within the waterbody.
- Where it is possible to separate natural background from nonpoint sources, the TMDL should include a description of the natural background.

Initial Pollutant Load to Segment X



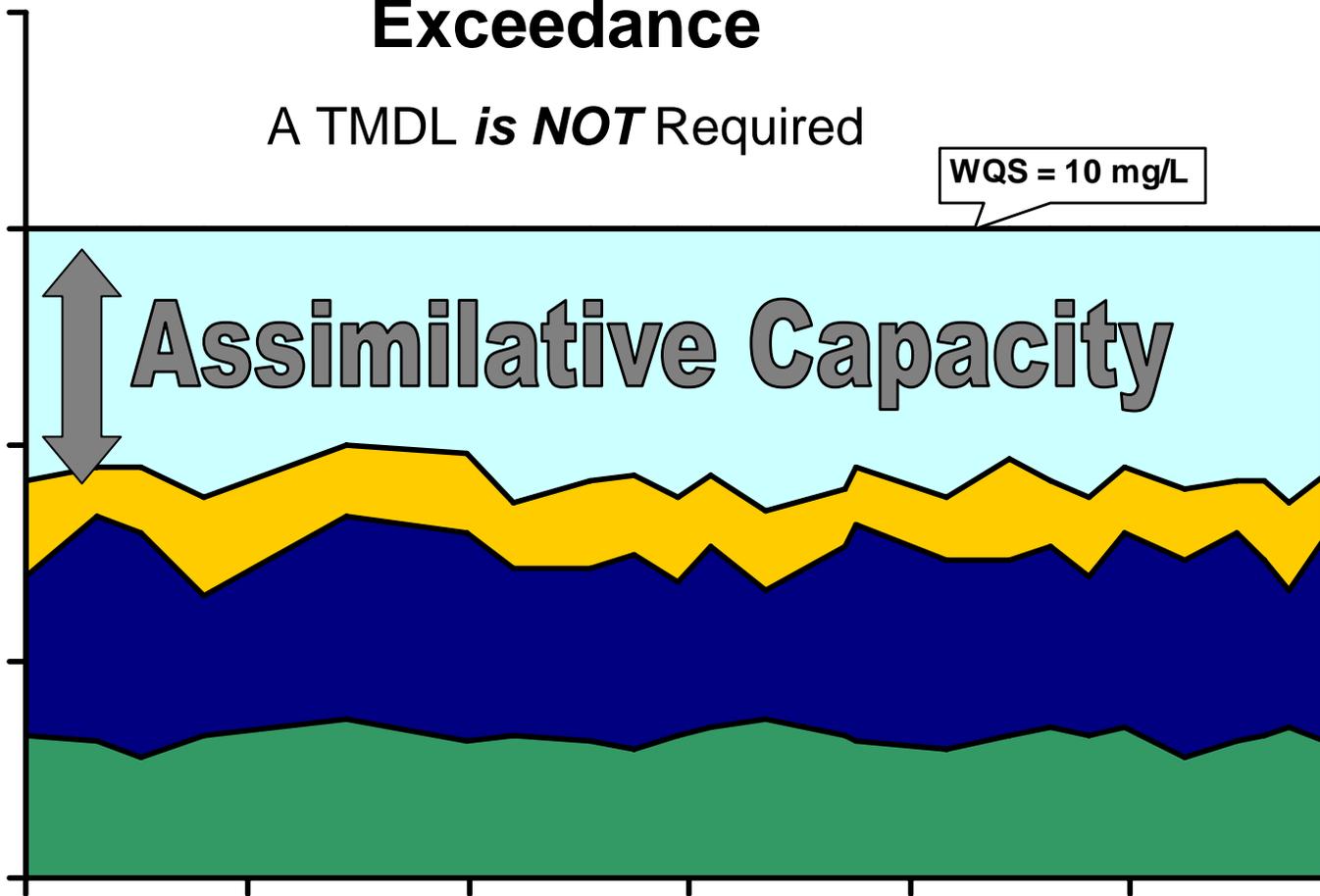
Load does not cause Criterion Exceedance

A TMDL *is NOT* Required

WQS = 10 mg/L

Assimilative Capacity

Pollutant concentration (mg/L) or relative load of pollutant



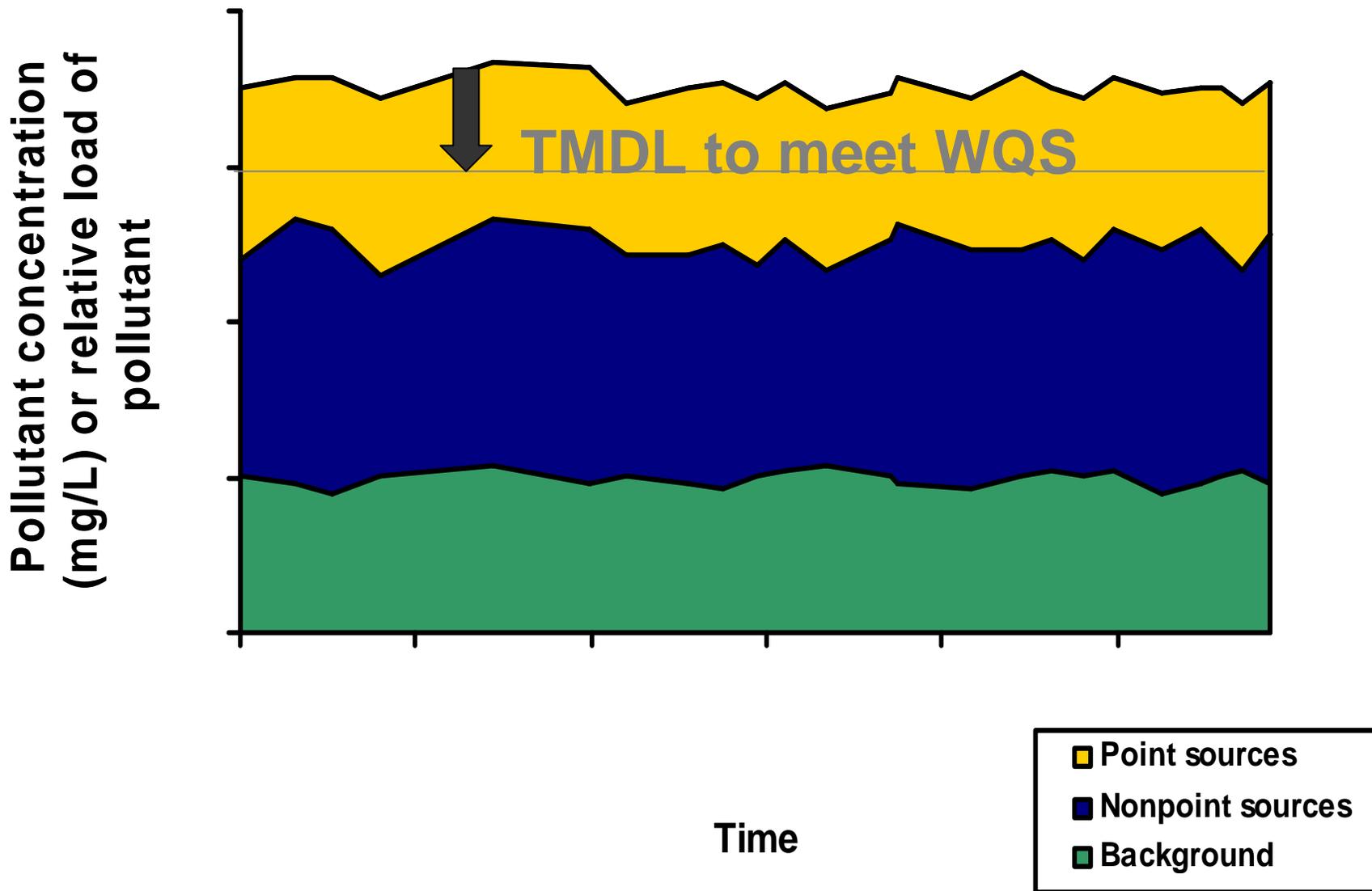
Time

- Assimilative Capacity
- Point Sources
- Nonpoint Sources
- Background

Example

No Remaining Assimilative Capacity

Need a TMDL to Meet WQS

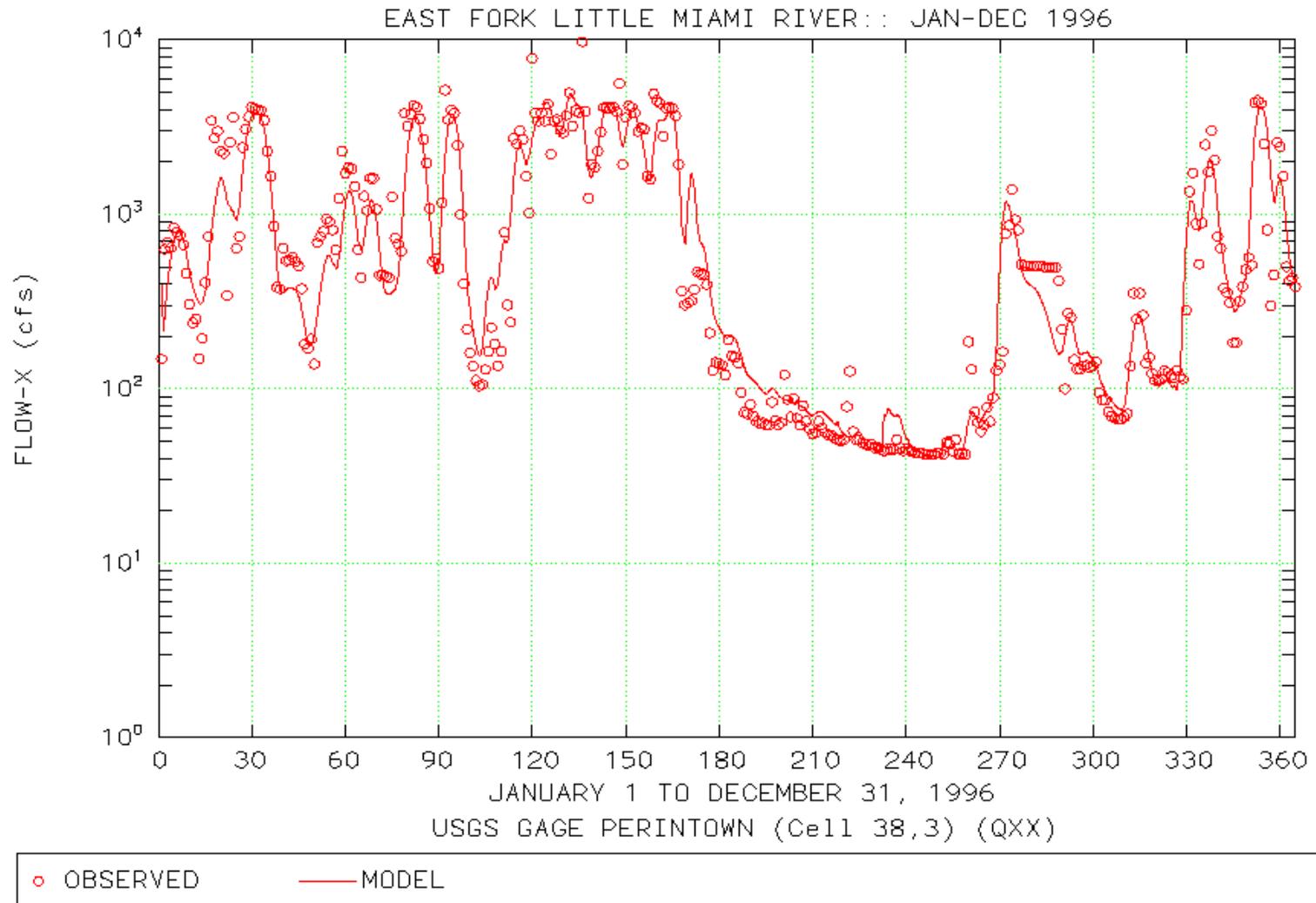


Task 4: Linkage between pollutant load and in-stream response

- Select an analytical/modeling approach based on:
 - Nature and complexity of the receiving water
 - Nature of pollutant – temporal & spatial considerations
 - Sources of pollutants
 - Expression of the Water Quality Criterion
 - Quantity and quality of data and information
 - Budget and available resources

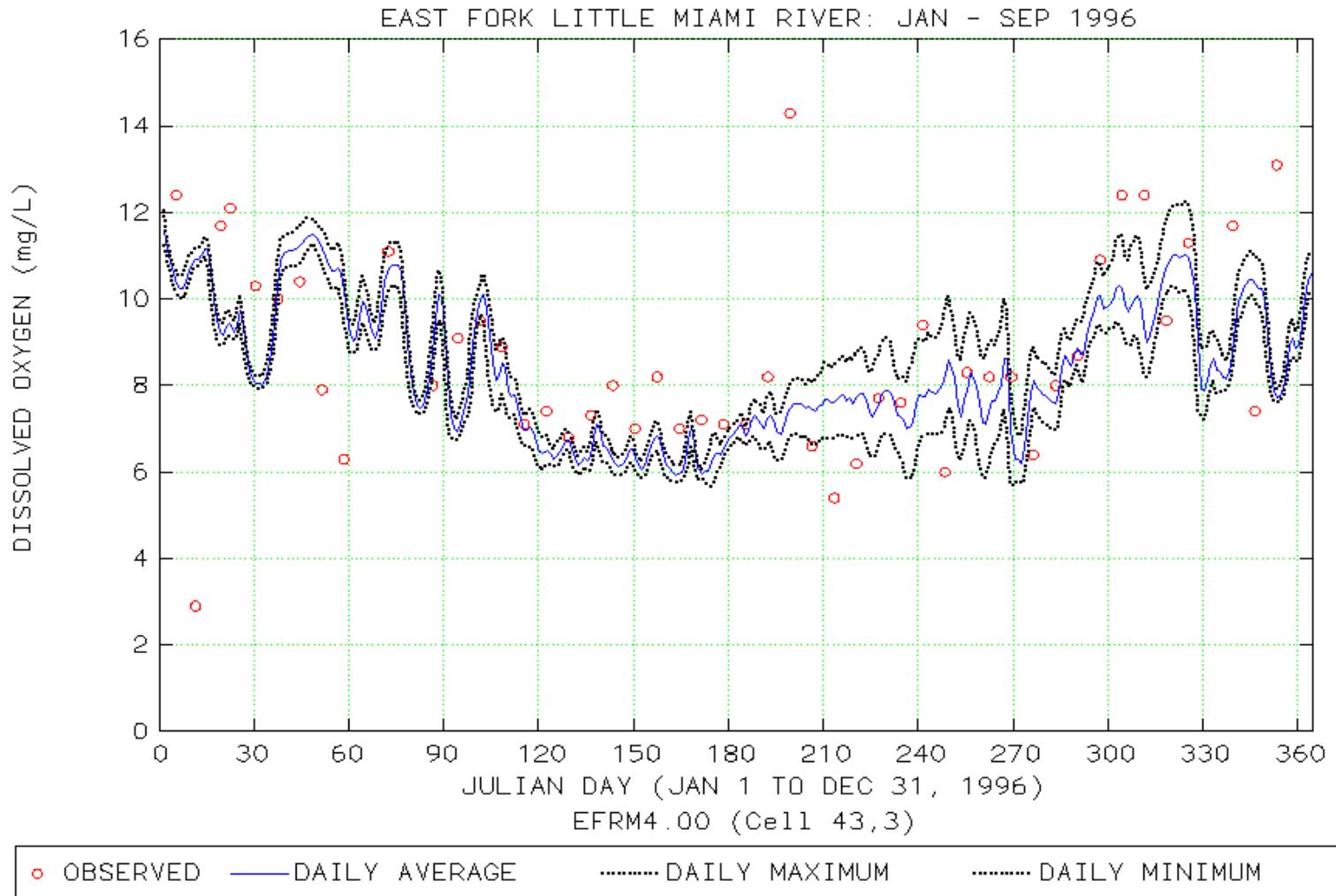
Receiving Water Quality Calibration

Example



Receiving Water Quality Calibration Examples

Example



Calculate the TMDL

1. Calibrate and verify selected model

- May require collection of additional ambient water column and loadings data

2. Evaluate pollutant reduction scenarios

- Start with point source reductions (regulated)
- Assess potential nonpoint source reductions

3. Define Maximum Daily Load that meets WQS

- Account for seasonal variation and critical conditions

4. Allocate Maximum allowable load (TMDL) to:

- Individual point sources
- Aggregated non-point sources
- Margin of Safety – MOS (when explicit)
- Reserve for future growth (optional)

TMDLs are Expressed as:

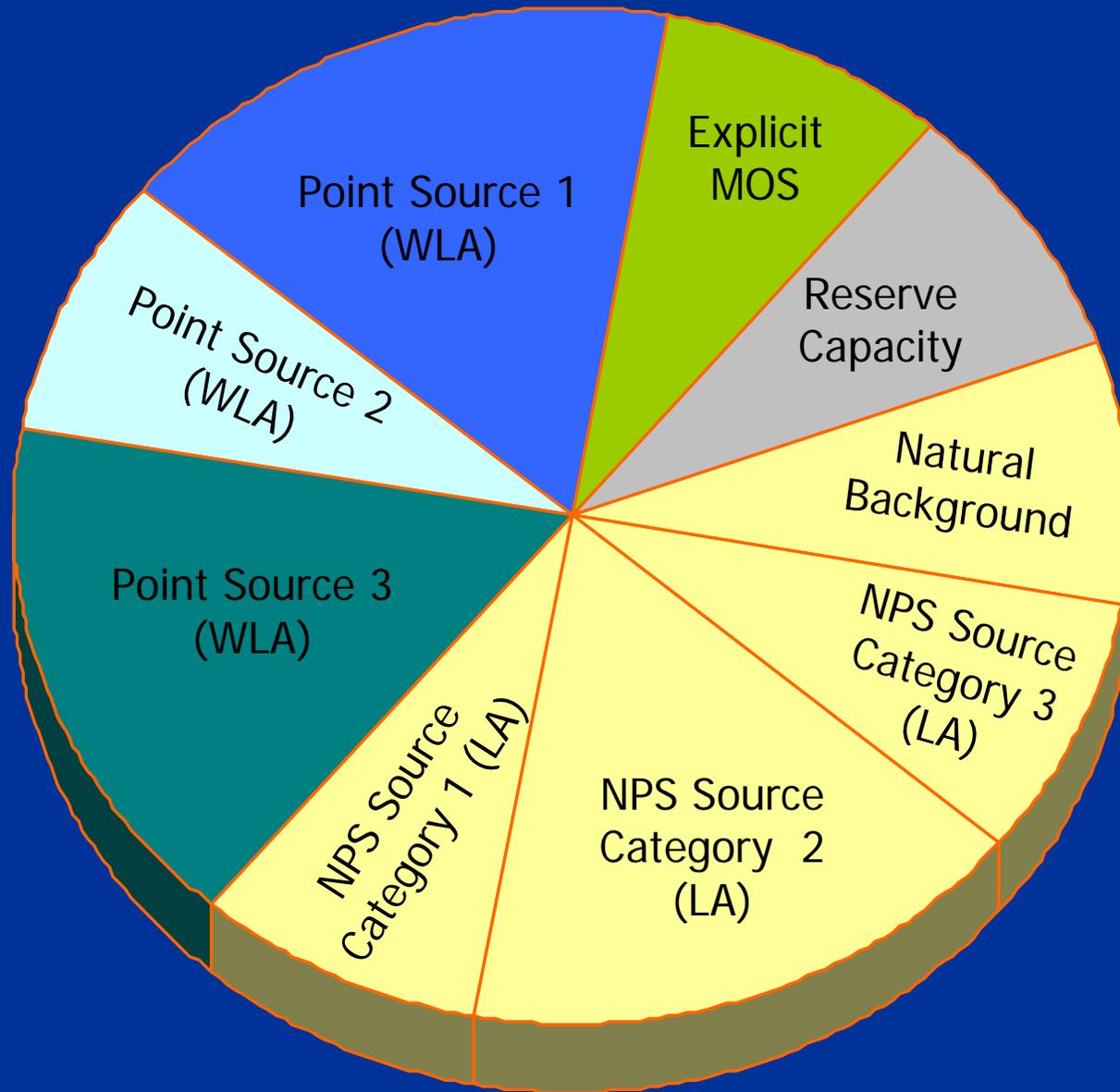
- Mass (e.g., pounds per day)
- Toxicity (e.g., toxic units)
- Energy (e.g., heat in temperature TMDLs)

Task 5: Allocate Loadings

Considerations when making allocation decisions:

- **Source** of the pollutant (point source or runoff)
- **Controllability** of the pollutant (i.e., atmospheric)
- **Regulatory authority** to control pollutant
- **Cost** of each allocation option
- **Certainty** of water quality impact in receiving water
- **Reasonable assurance** that allocation can be met
- **Stakeholders objectives**

TMDL Allocation



Allocation Example

TMDL Allocation (cont.)

- **Reasonable Assurance** – option for increased allocation to a Point Source
 - Requires a nonpoint source reduction that:
 - Exceeds initial NPS allocation in the initial TMDL
 - Is “required” by a contractual agreement between the point source and the nonpoint source
 - Results in attainment of water quality standard
- **Trading Policy** – Allows point sources to meet their WLAs by buying pollutant credits from point and nonpoint sources that are exceeding their baselines established by the WLAs and LAs

New Emphasis on “Daily Load”

- ***Court Decision*** in 2006
 - U.S. Court of Appeals for the D.C. Circuit in *Friends of the Earth, Inc. v. EPA, et al.*
 - Two TMDLs for the Anacostia River ***did not comply with CWA*** because not expressed as "daily" loads
- ***EPA Response***
 - TMDLs calculations should be done with appropriate time step to meet WQS
 - All future “non-daily” TMDLs ***should also*** be expressed in daily time increments
 - No change to existing policy and guidance on implementing WLAs in NPDES permits

TMDL Implementation

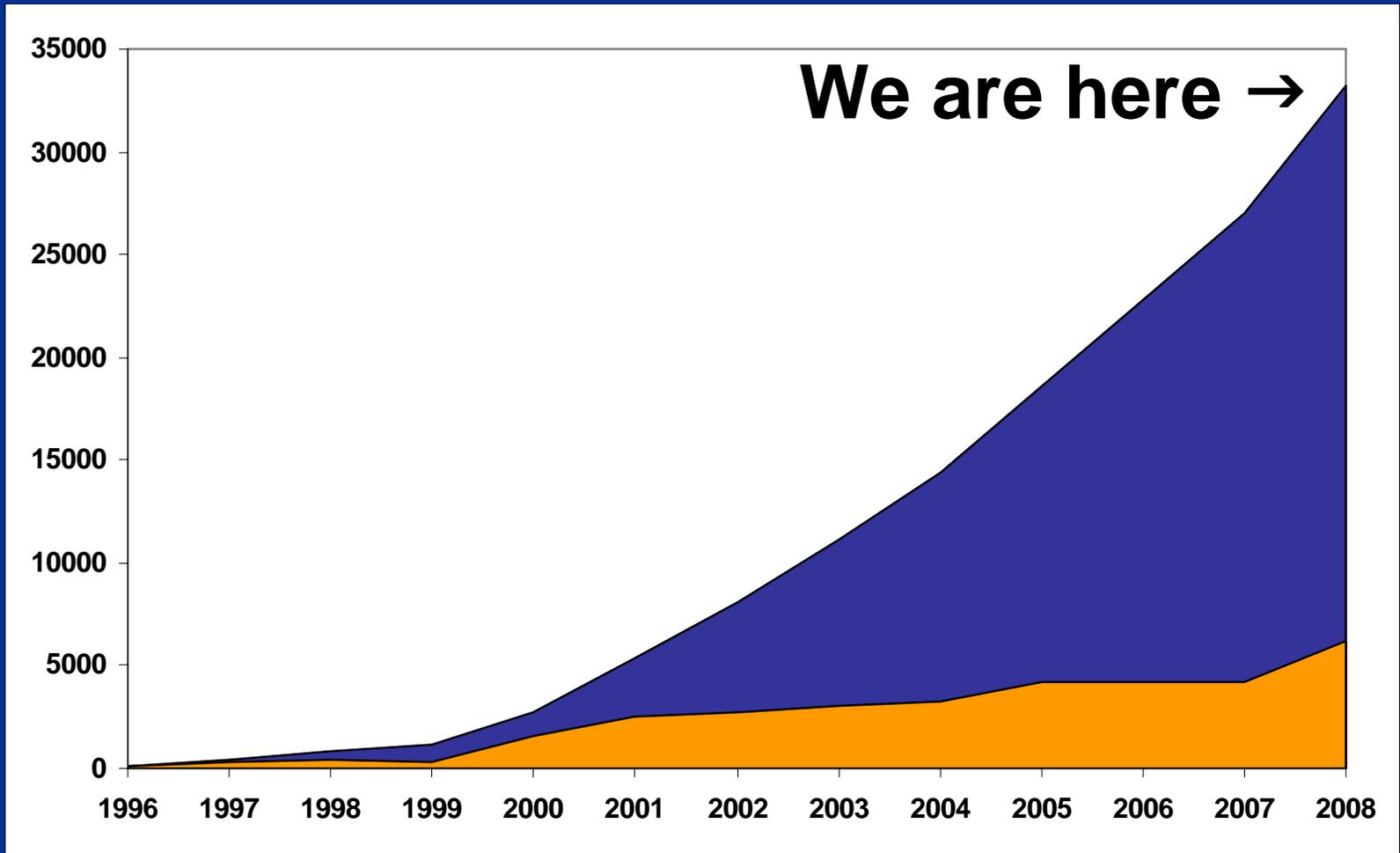
- TMDLs not self implementing under 303(d)
- Point Sources:
 - Permit limits consistent with WLA are enforceable under CWA through National Pollutant Discharge Elimination System (NPDES)
 - Issued by EPA or States w/ delegated authority
- Nonpoint Sources:
 - No federal regulatory enforcement program
 - Primarily implemented through State/Tribal/local NPS management programs (few w/ regulatory enforcement)

Public Participation

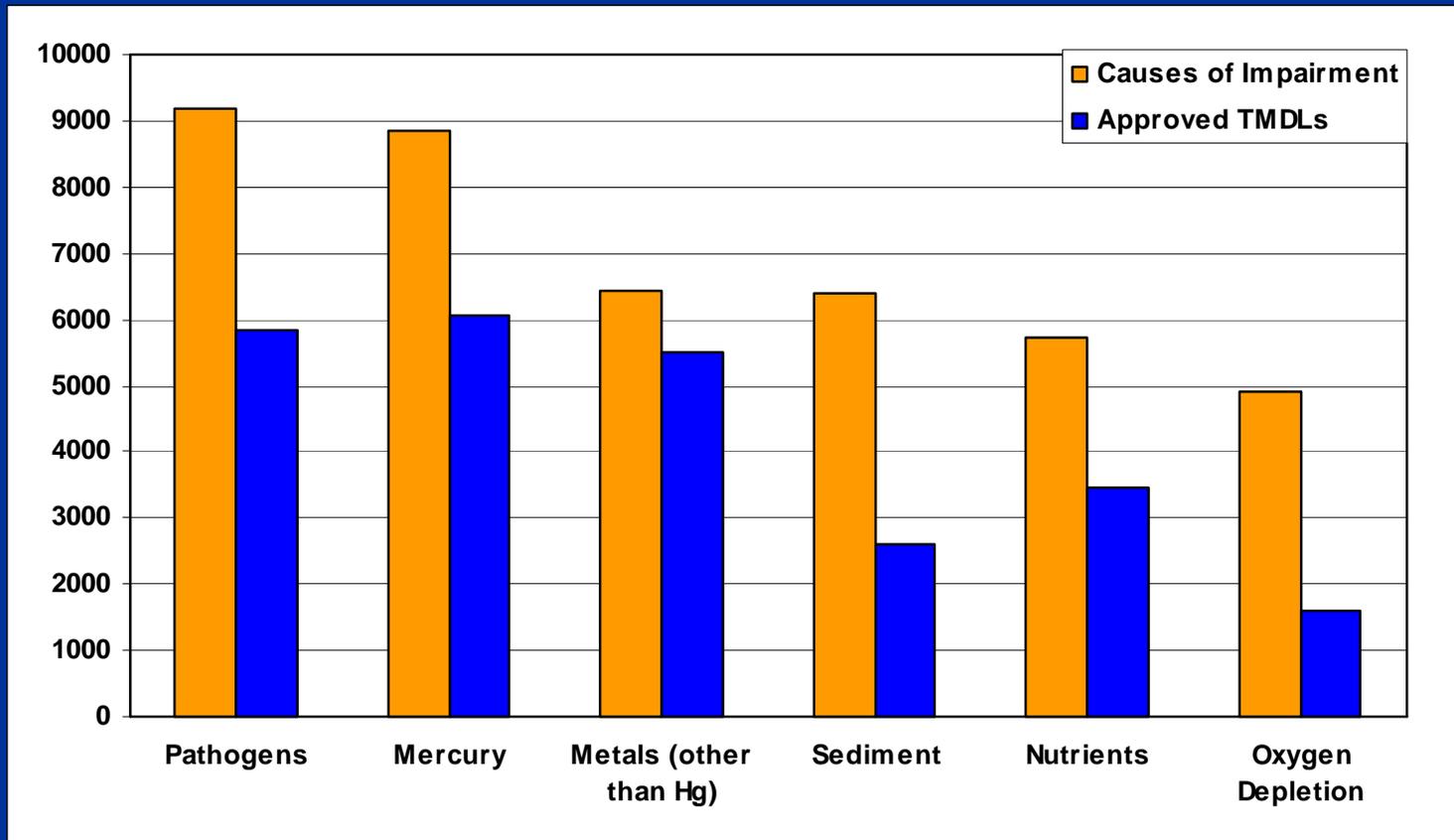
- **Public/stakeholder role:**
 - Provide data and information to the states
 - Review and comment on draft 303(d) list
 - Review and comment on draft TMDLs
 - Assist in the development of 3rd party TMDLs

Over 33,000 TMDLs Completed

Status: TMDLs Completed



TMDLs needed by pollutant type and number of TMDLs that have been developed



May 2008 Approx. 65,000 TMDLs needed; over 33,000 developed (3/2008)

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TMDLS

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Questions?

For more information...

TMDL Home Page

<http://www.epa.gov/owow/tmdl/>

2006 Integrated Report Guidance

<http://www.epa.gov/owow/tmdl/2006IRG/>

2008 Integrated Report Memo

http://www.epa.gov/owow/tmdl/2008_ir_memorandum.html

Daily Loads Technical Document

http://www.epa.gov/owow/tmdl/draft_daily_loads_tech.pdf

Category 5m Listing (Mercury)

<http://www.epa.gov/owow/tmdl/mercury5m/>