



Total Maximum Daily Loads: What are they and how can they impact ports, harbors, and coastal communities?

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What's the big deal?

- Compliance
 - POLA/POLB = \$9 Billion
 - 30,000,000 cy of sediments to be removed
 - Significant stormwater BMPs
 - Marina del Rey
 - 600,000 cy of sediments to remove with capping
 - Significant stormwater BMPs
 - 85% boat paint conversion

Presentation Outline

- What is a total maximum daily load (TMDL)?
- What is the TMDL process?



What is a TMDL?

- A regulatory term in the Clean Water Act (CWA) that describes the maximum amount of a pollutant that a body of water can receive and still meet water quality standards



What is a TMDL?

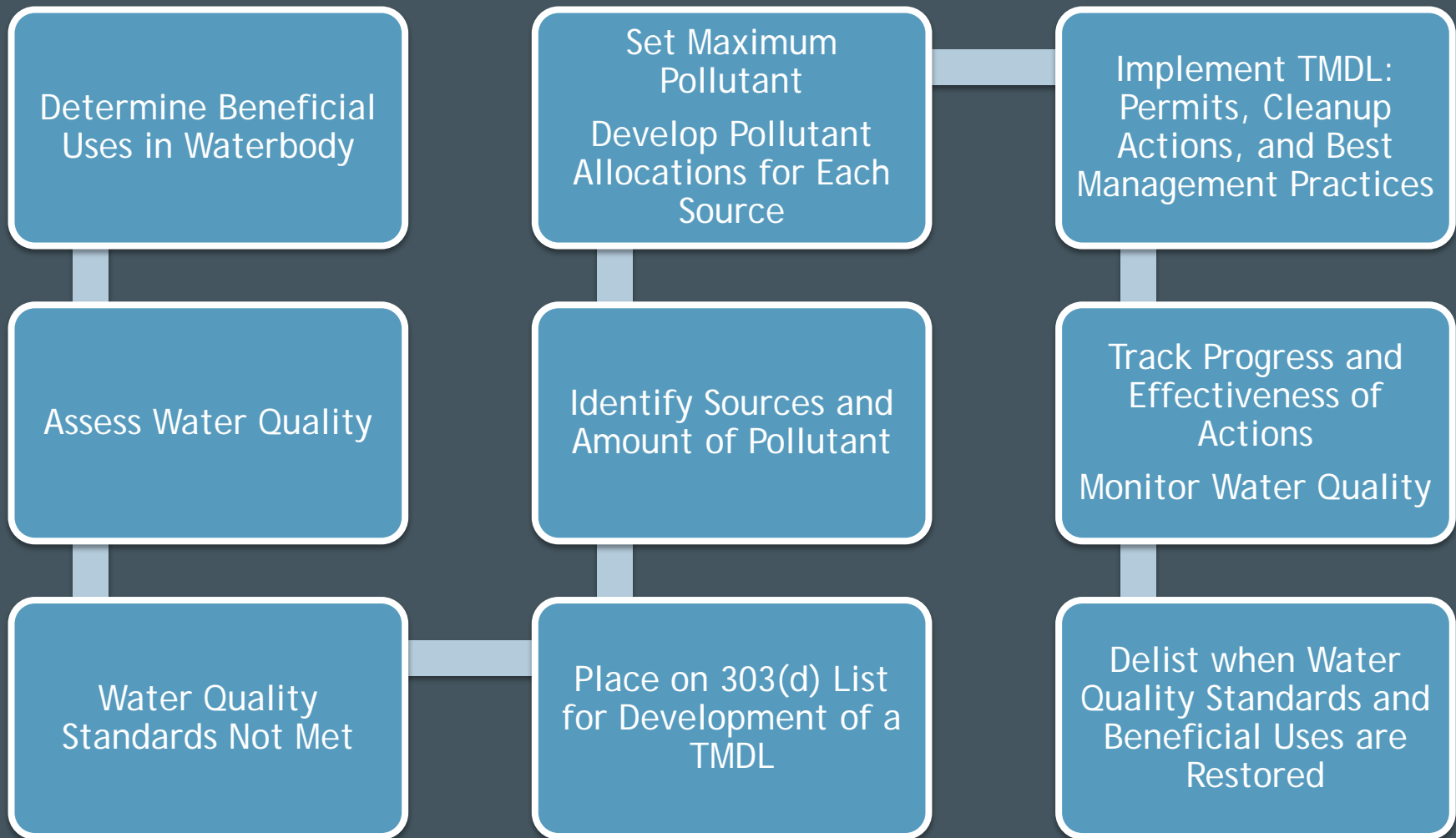
- A regulatory term in the Clean Water Act (CWA) that defines the maximum amount of a pollutant that water can receive and still meet water quality standards



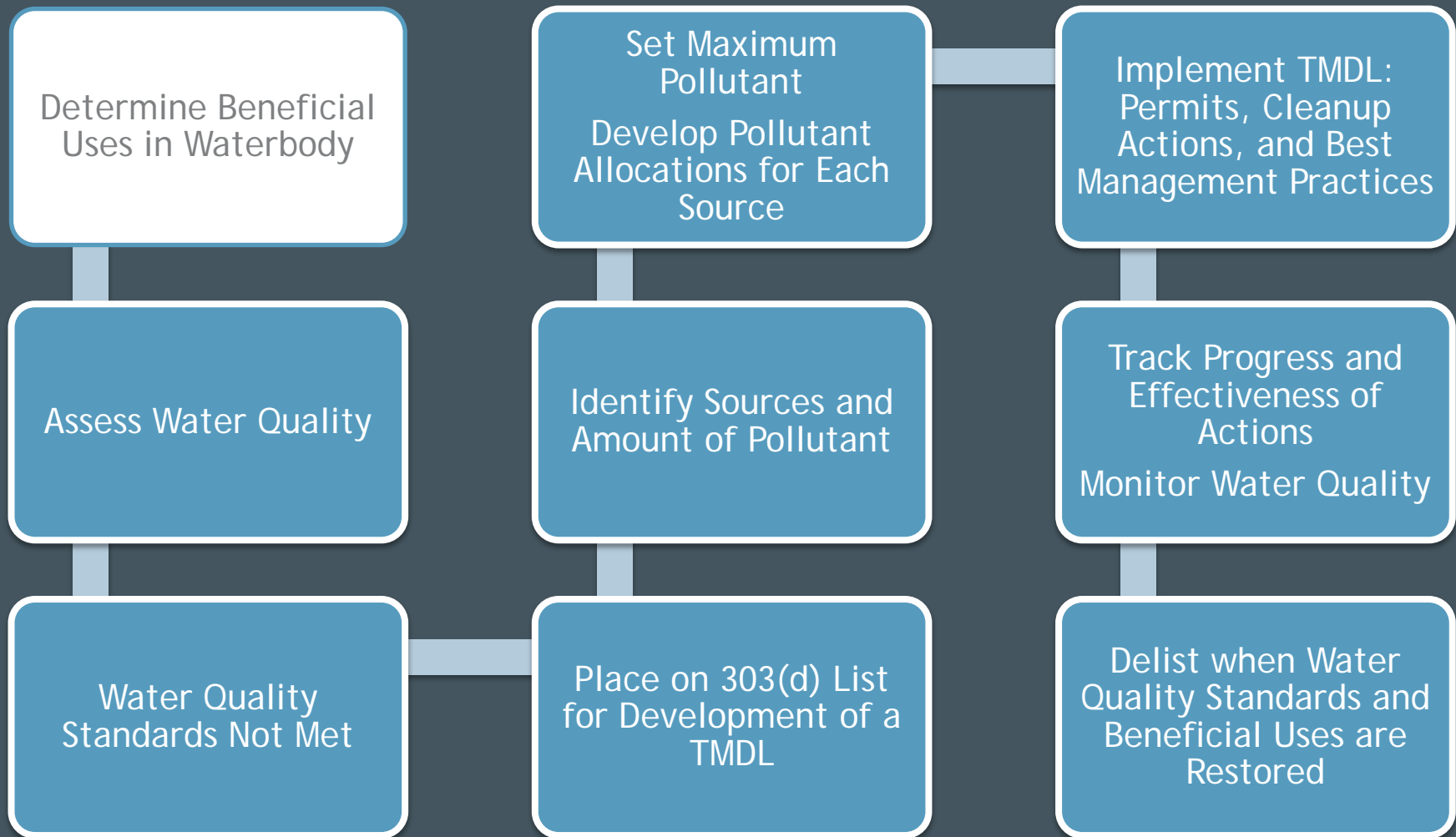
Why do we have TMDLs?

- CWA
 - "Restore and maintain the chemical, physical, and biological integrity of the Nation's waters"
 - Requires states to list impaired waters and develop TMDLs for priority ranked waters
 - Requires states to develop TMDLs for pollutants in waters where pollution controls are required to meet water quality standards

TMDL Process



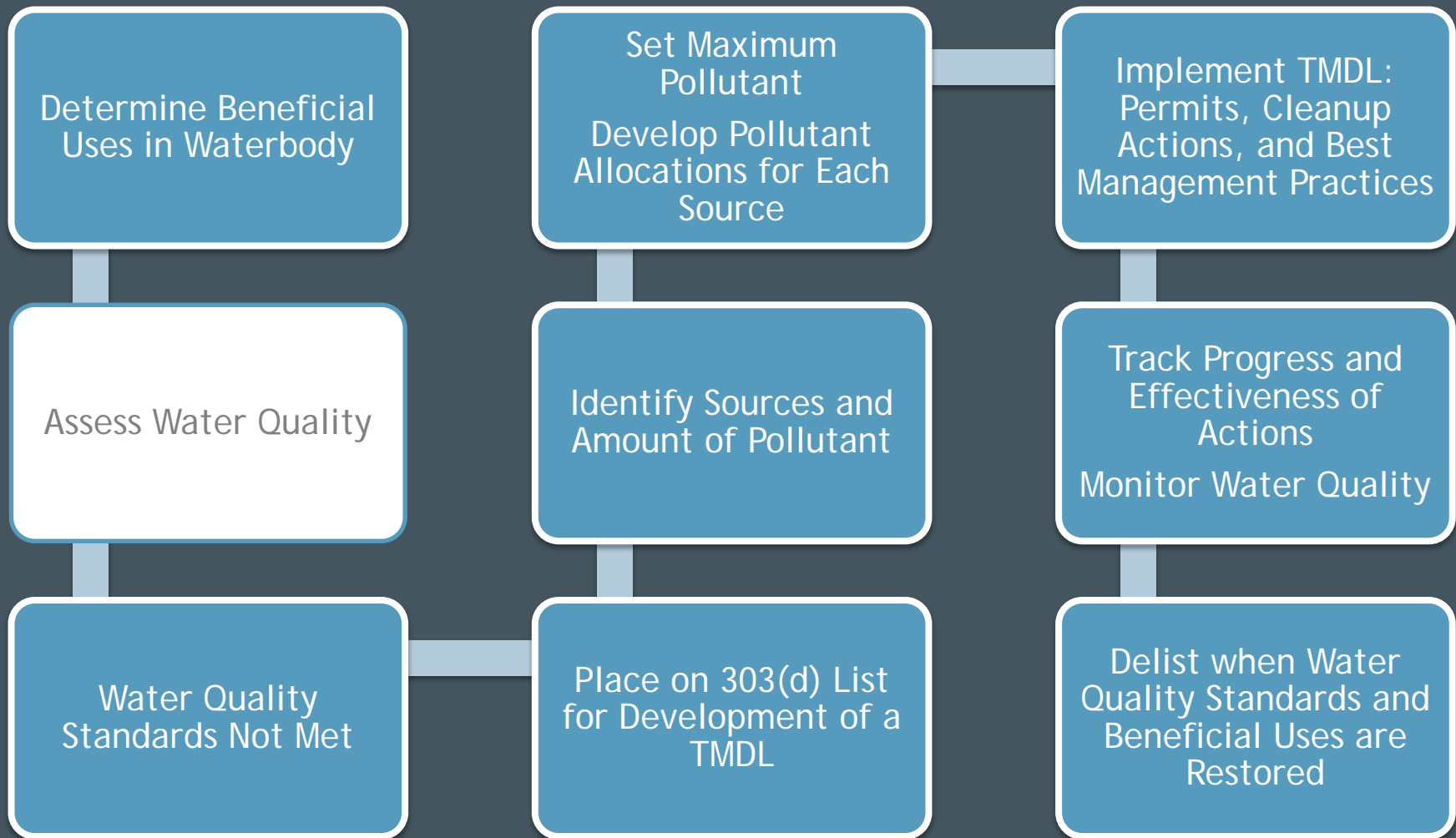
TMDL Process



Designated Beneficial Uses Within Harbors

- Navigation
- Industrial service supply
- Recreational use water contact
- Non-contact water recreation
- Commercial and sport fishing
- Protection of aquatic life, including marine
- Rare and endangered species and habitat
- Areas for spawning and reproduction
- Wildlife habitat
- Shellfish harvesting

TMDL Process



Data Collection Programs

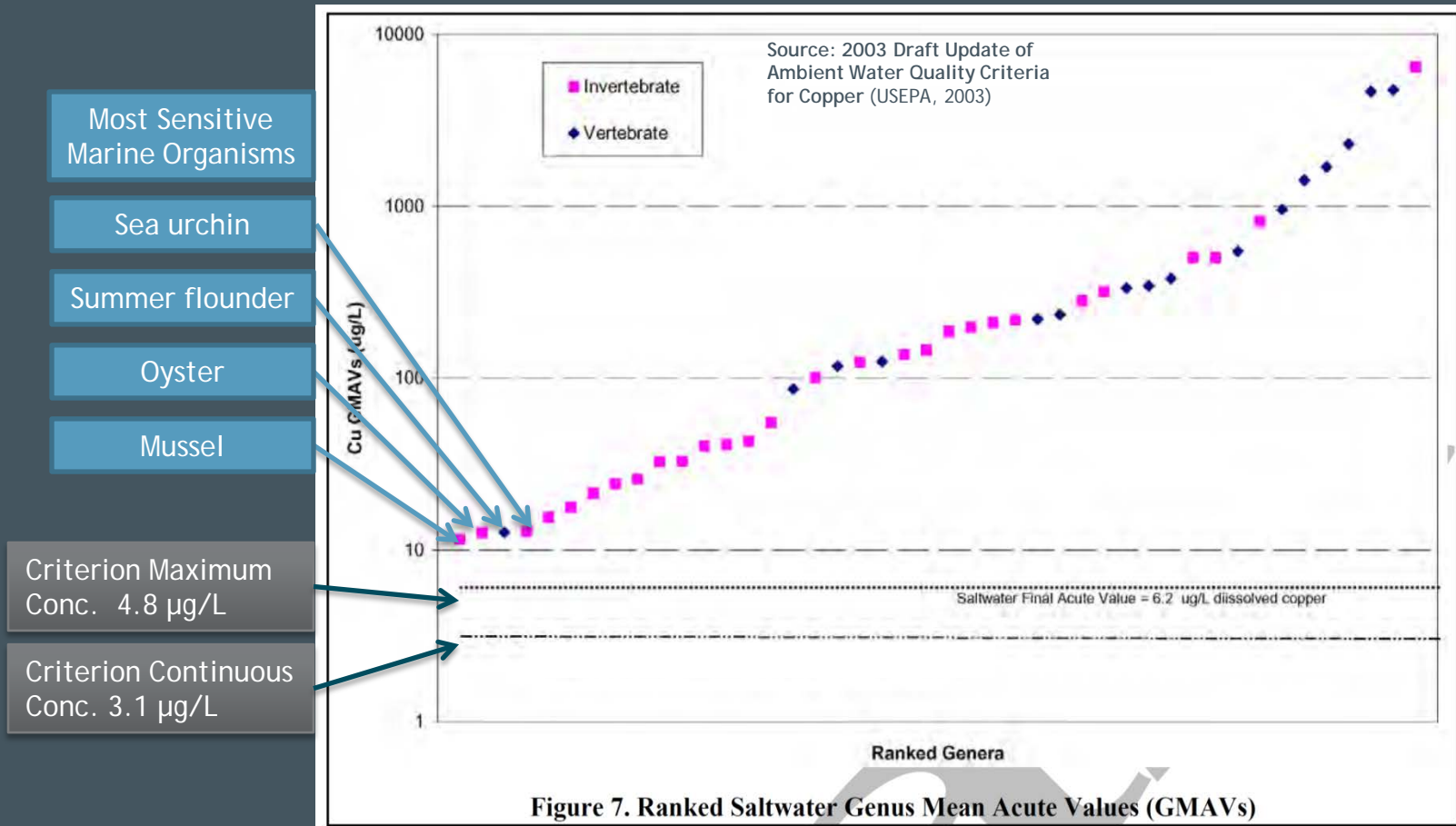
- Permit compliance
- Dredged material characterization
- Regional monitoring programs



Water Quality Criteria

- Narrative Criteria
 - "Waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses."
- Numeric Criteria
 - "The ambient water quality criterion for copper is 3.1 $\mu\text{g/L}$ for the protection of marine aquatic organisms"

Example Issue – Copper TMDLs use conservative numeric targets

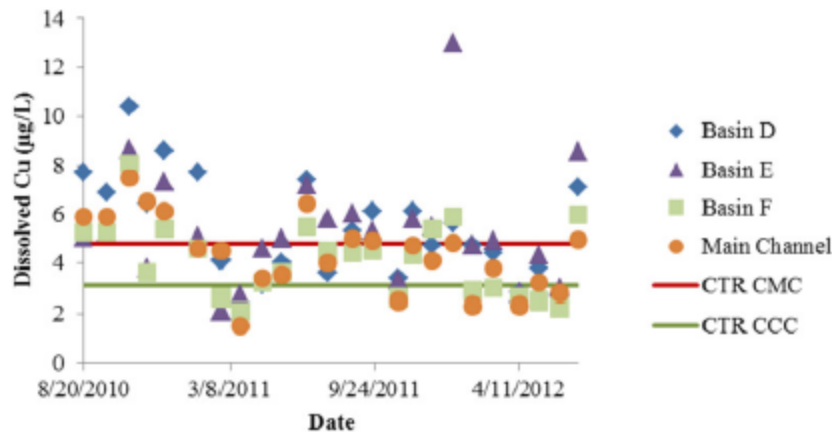


Data suggest that development of site specific objectives in accordance with USEPA (1994) may be appropriate.

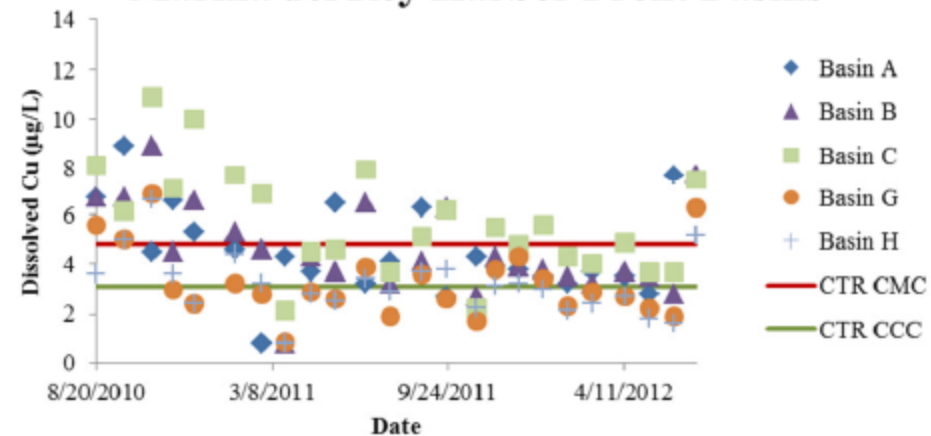
Marina del Rey

Figure 4-12. Copper in Marina del Rey Harbor Water Column

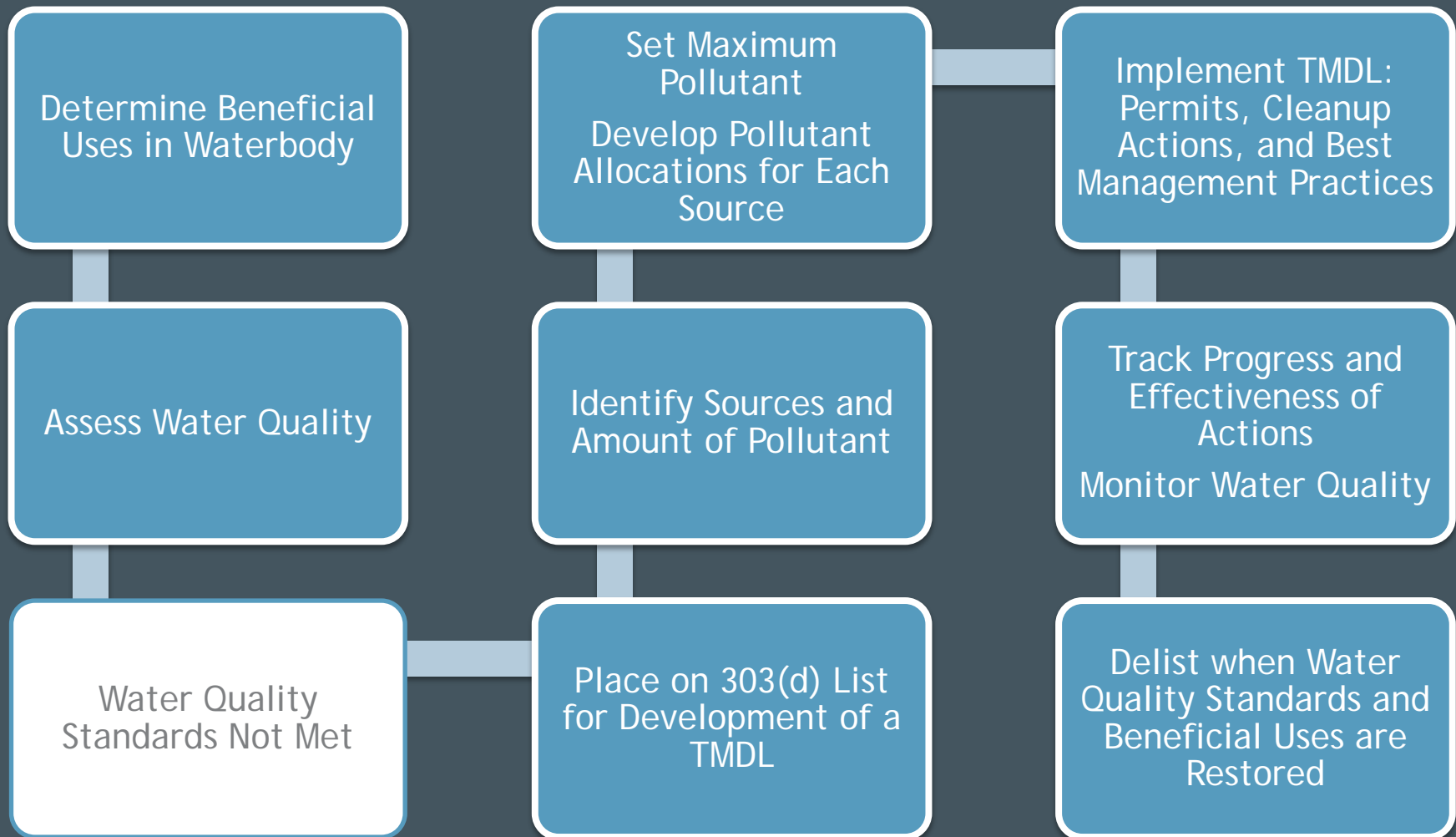
**Figure 4-11a. Dissolved Cu:
Marina del Rey Harbor Back Basins**



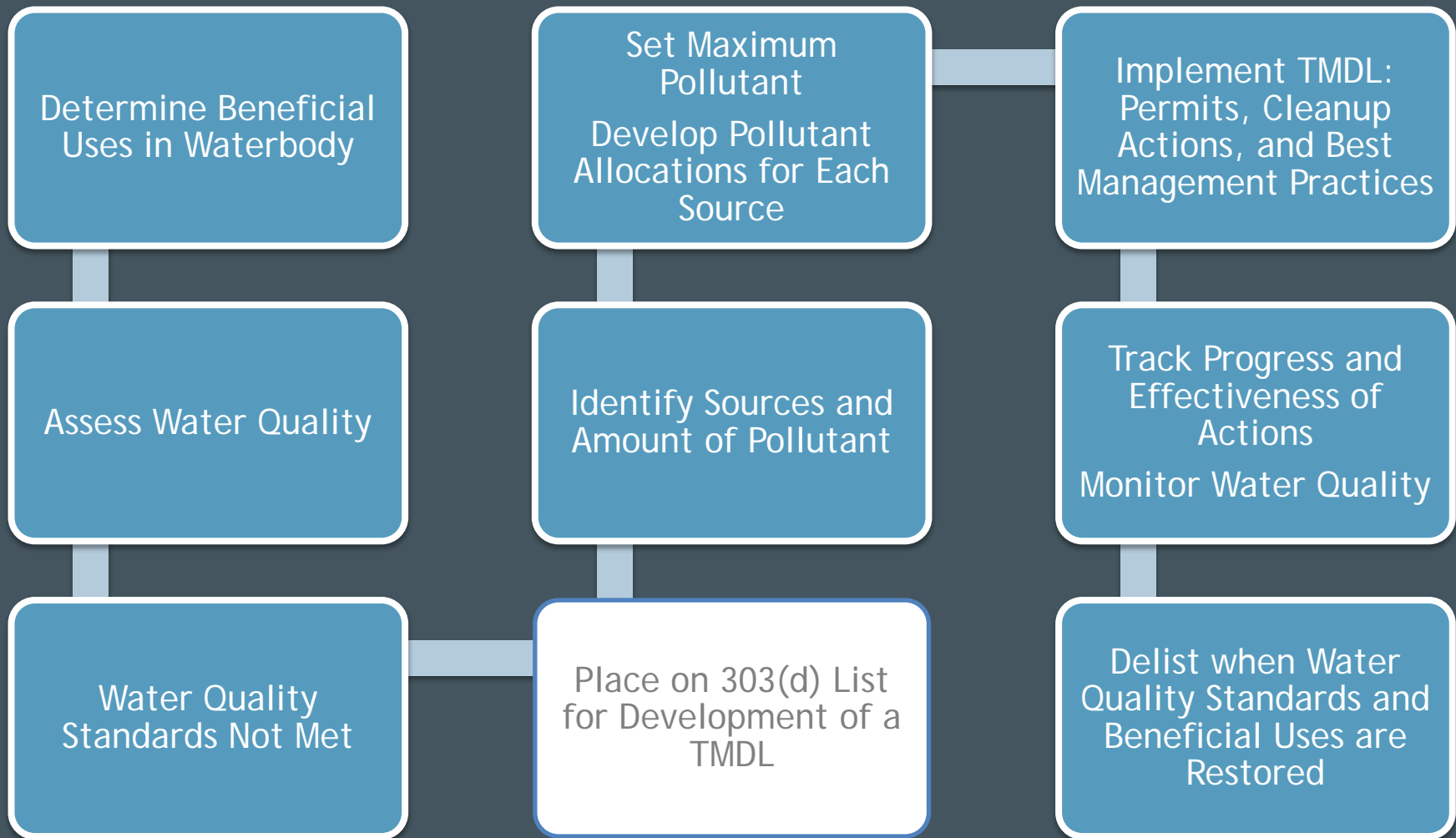
**Figure 4-11b. Dissolved Cu:
Marina del Rey Harbor Front Basins**



TMDL Process



TMDL Process

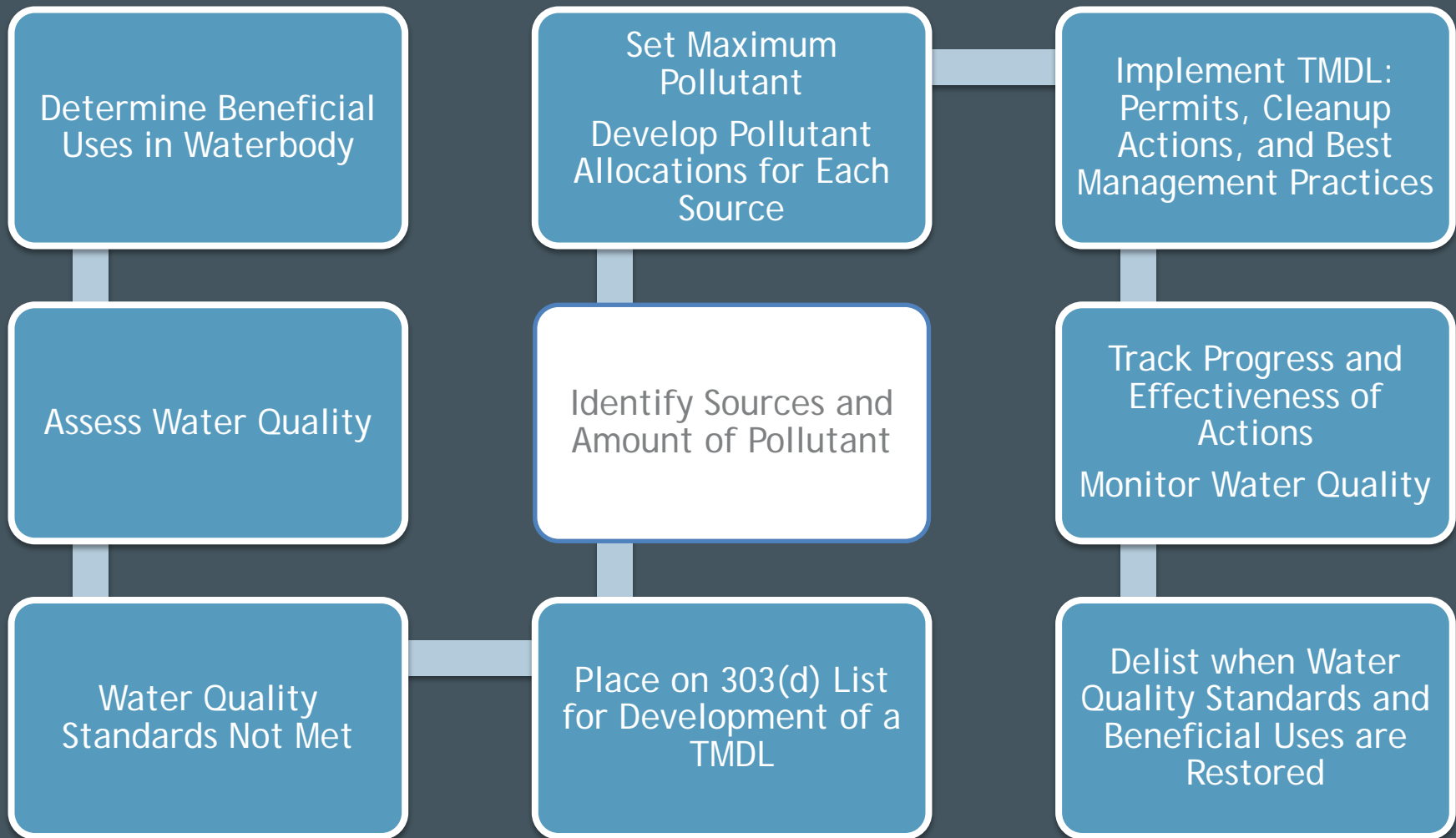


303(d) List for Harbor Waters

- Water quality
 - Chemicals, nutrients, sediments
 - Toxicity
 - Bacteria
- Sediment quality
 - Sediment-bound contaminants
 - Benthic health
 - Sediment toxicity
- Fish tissue quality
 - Fish tissue and sediment



TMDL Process



Potential Sources of Pollutants

Treatment Plants

Rivers

Air Deposition

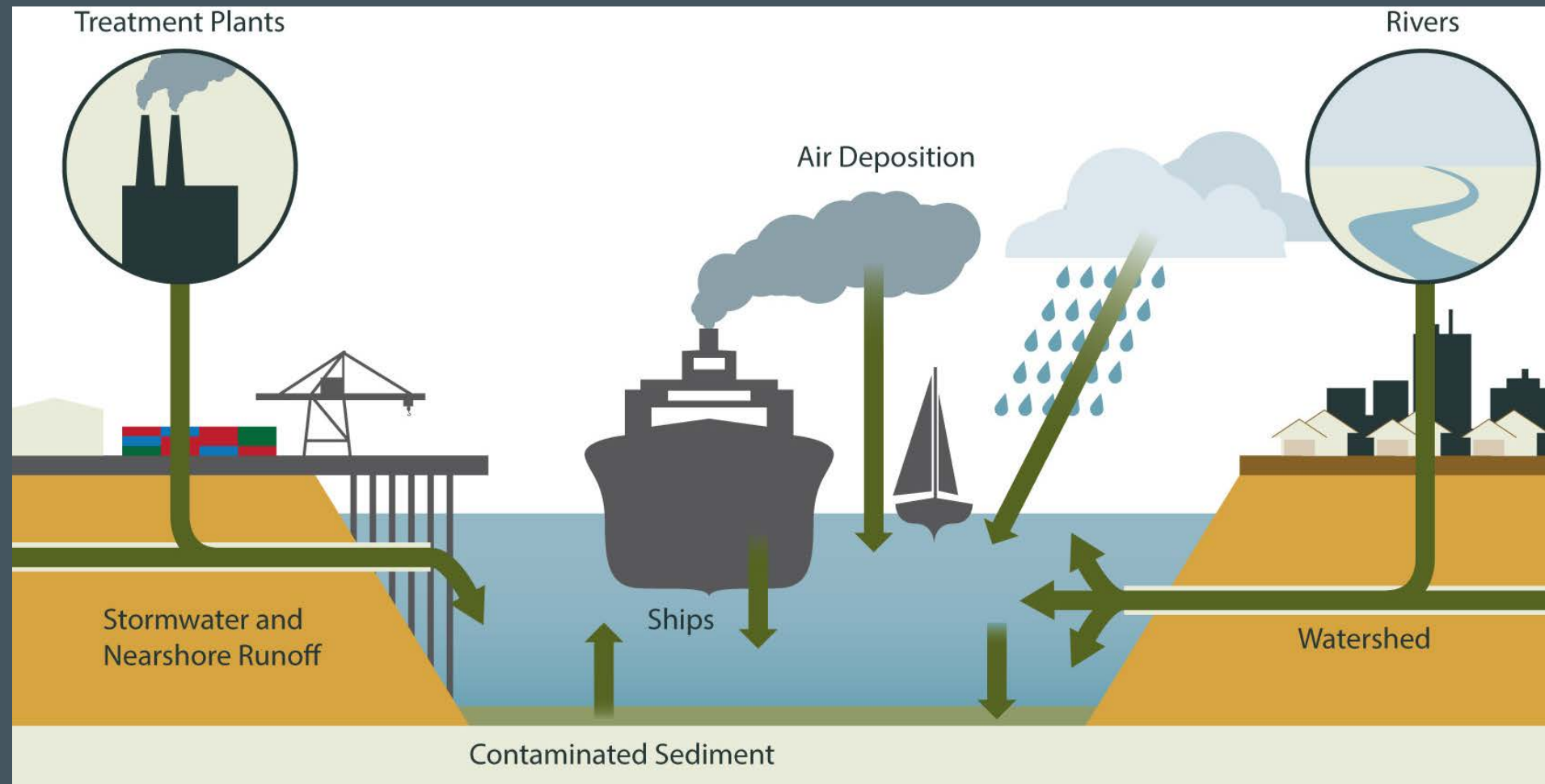
Ships

Stormwater and
Nearshore Runoff

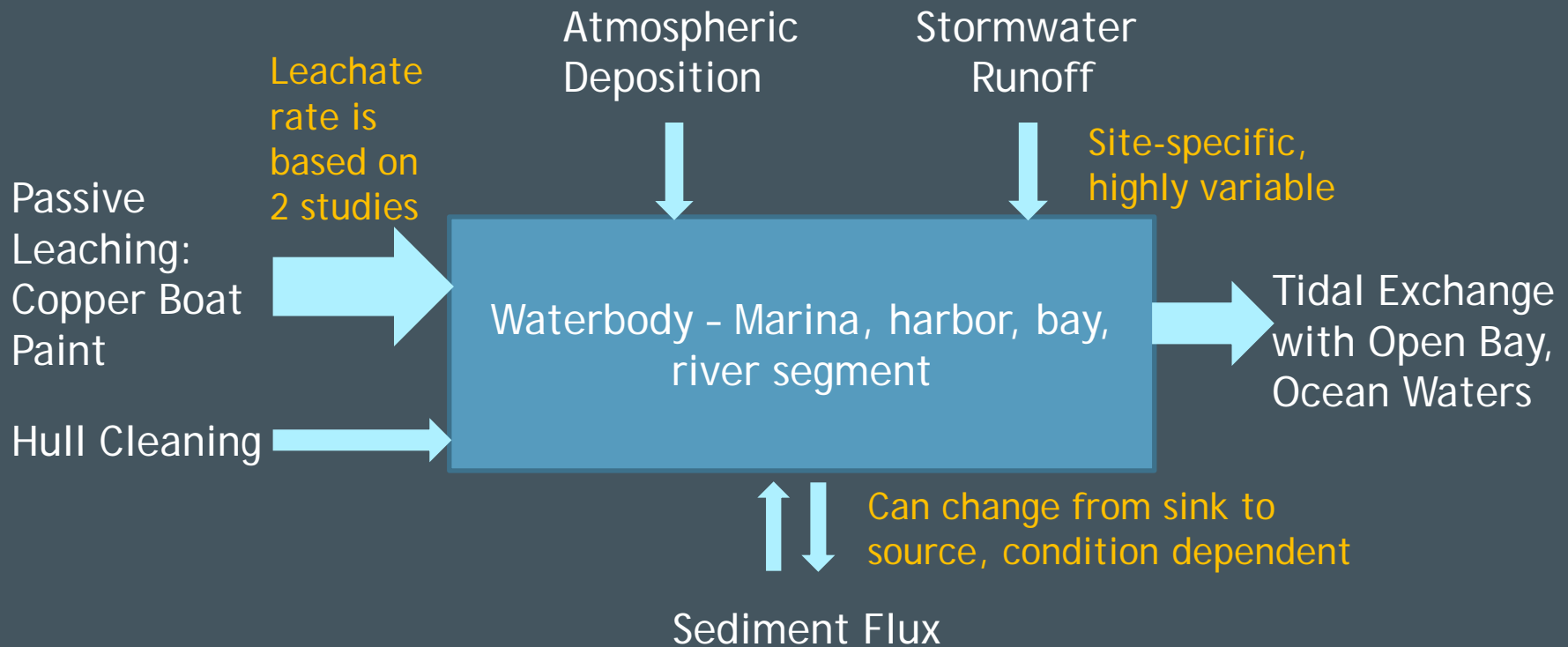
Watershed

Contaminated Sediment

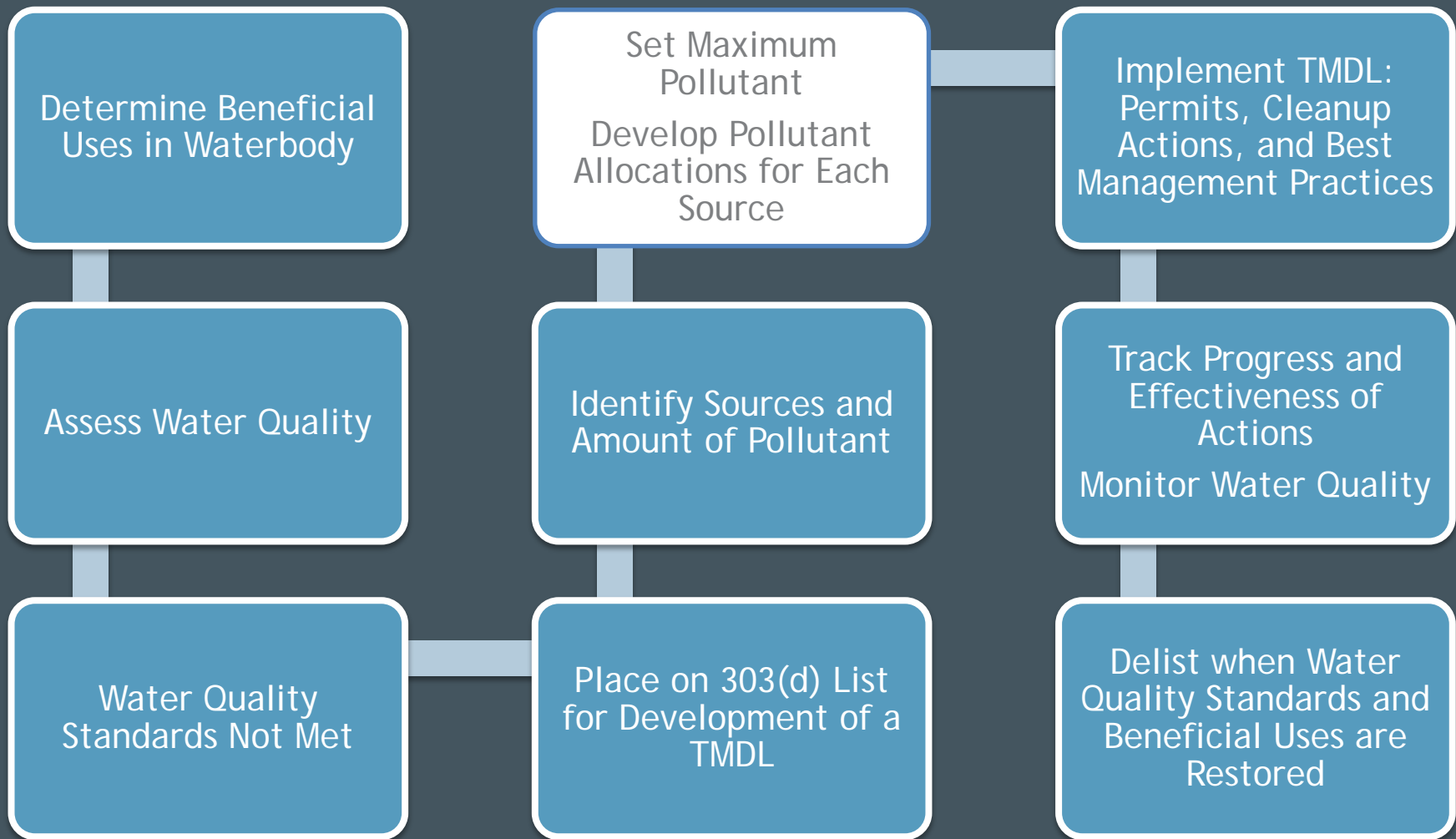
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Example Issue – Copper TMDLs assumed sources and sinks



TMDL Process



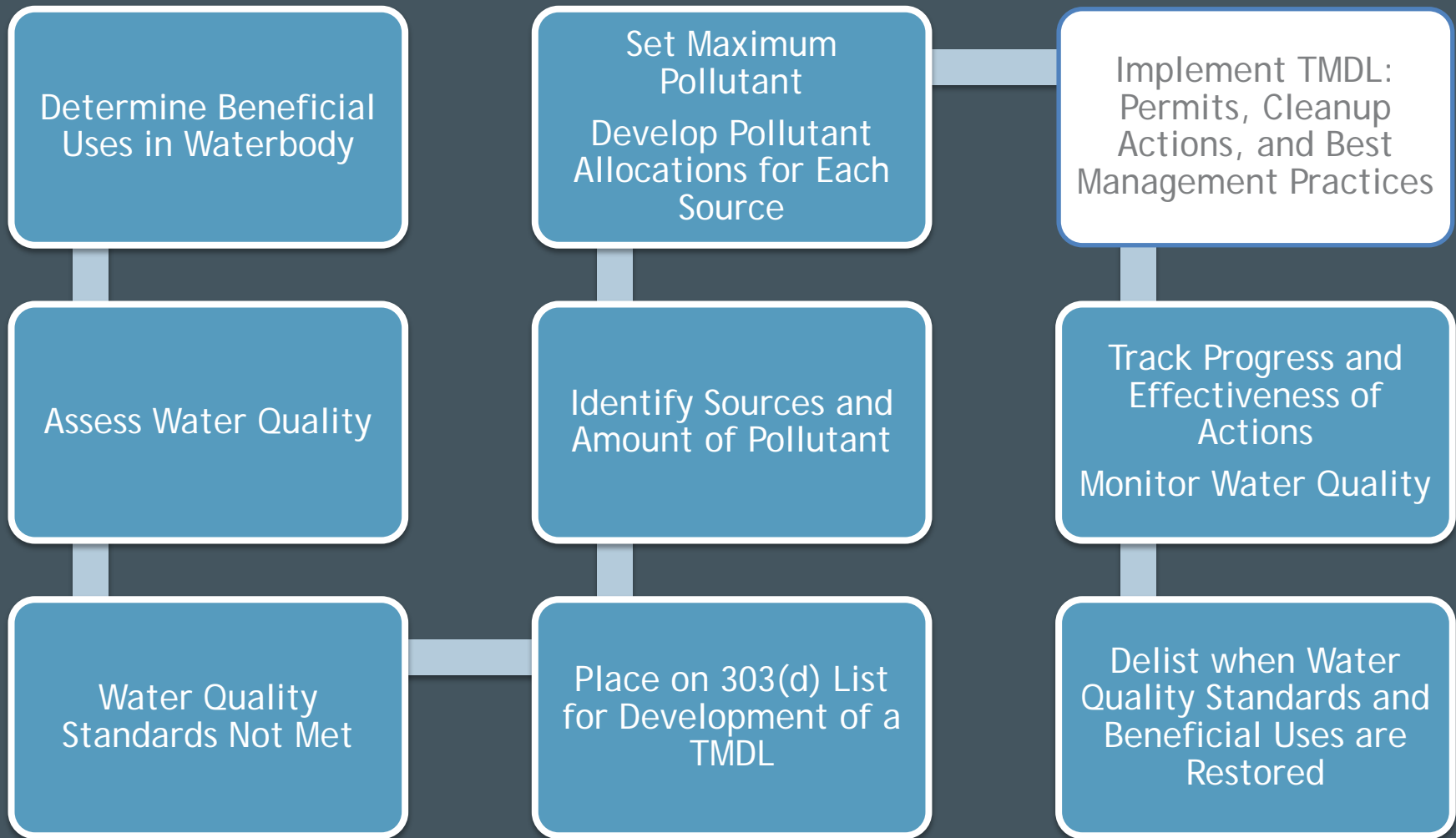
Calculating the TMDL

- Determine numeric value that meets water quality standard, which is protective of the beneficial use (the amount allowed to be in the bath tub)
- Determine loading capacity (the amount that can be added to the bath tub)
- Divide (allocate) pollutant load amongst all sources (the amount allowed to flow from each faucet)

The Resulting TMDL

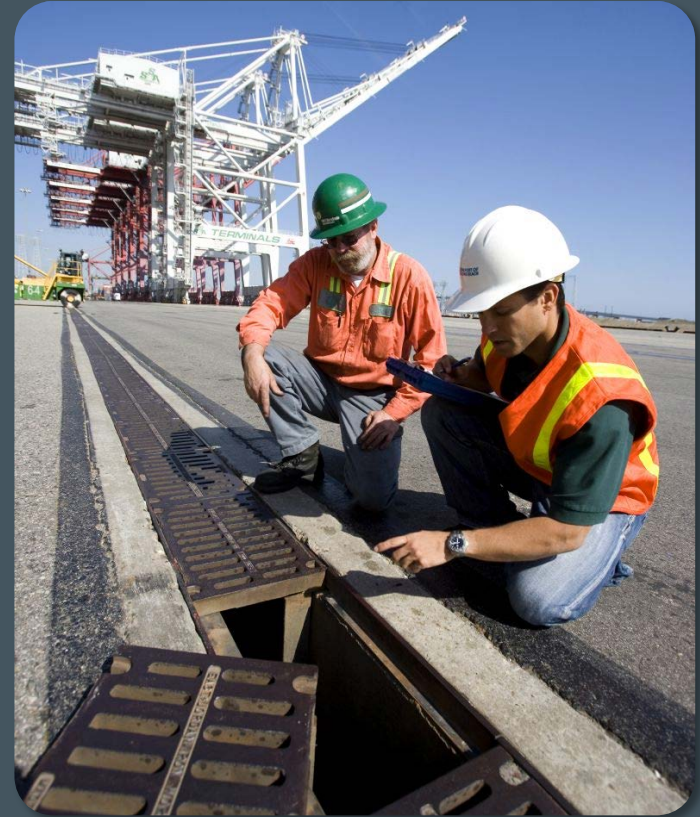
$$\frac{\text{Waste Load Allocation} + \text{Load Allocation Margin of Safety}}{\text{Attainment of beneficial uses}}$$

TMDL Process



Meeting TMDLs

- Reduce boat paint contributions
- Design and construct BMPs that meet waste load allocations for stormwater

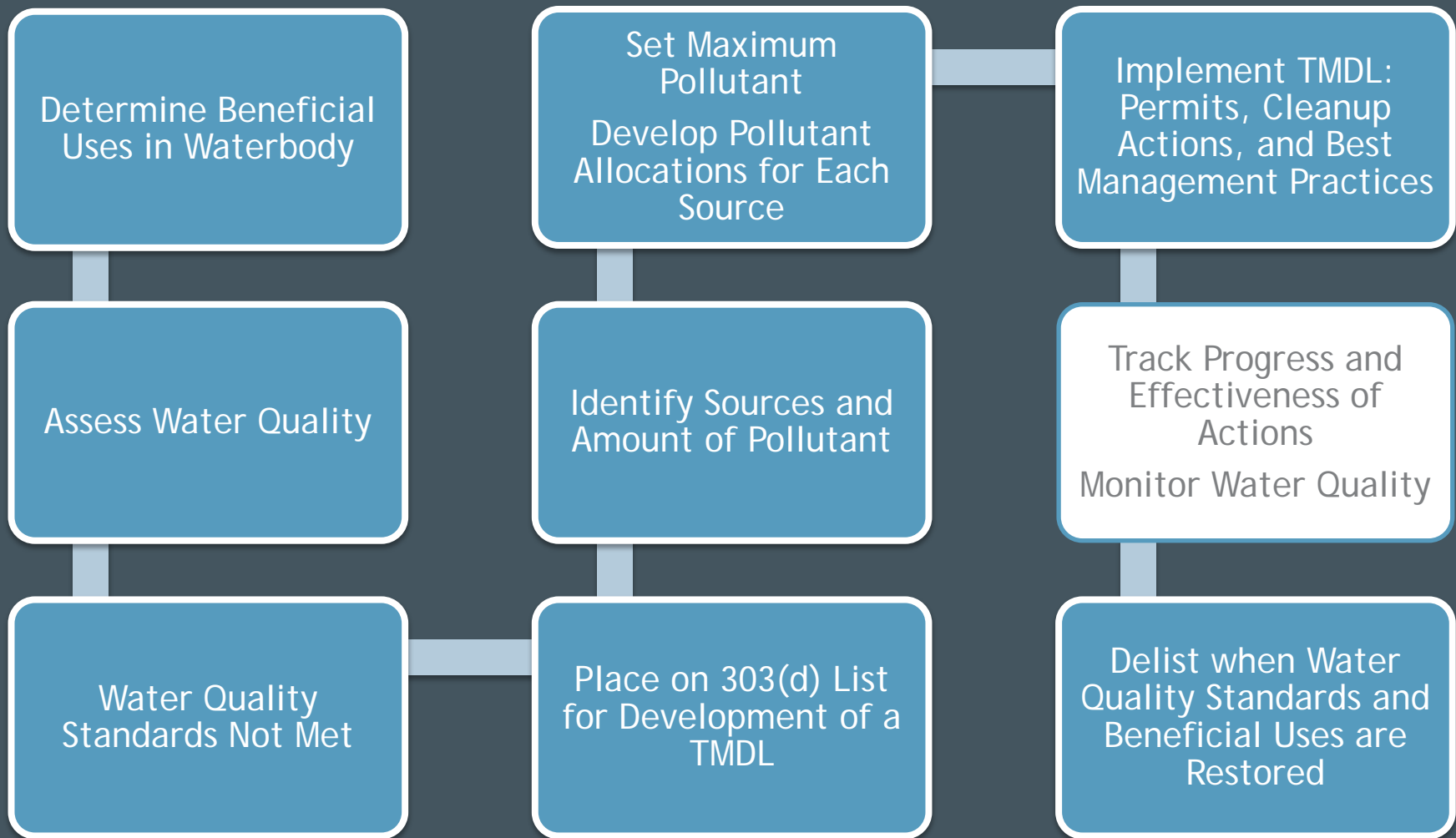


Dredge to Clean or Cleaner

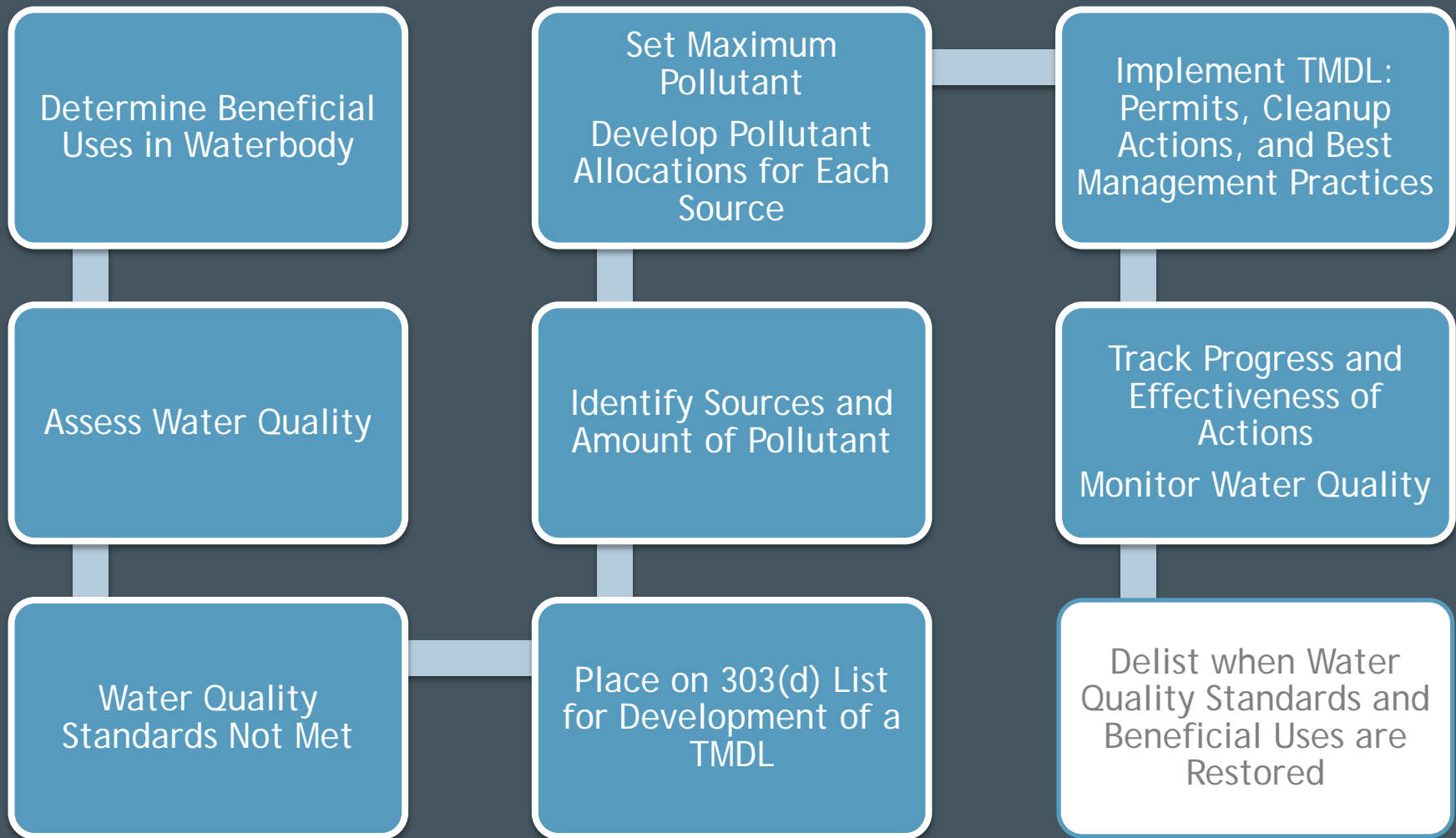
- Z-layer testing
- Confirm post-dredge surface
- Enforcing anti-degradation policy
- Define approach to maintenance versus new work
- Set expectations for regulators and contractors
- Incorporate sediment management planning into dredging projects



TMDL Process



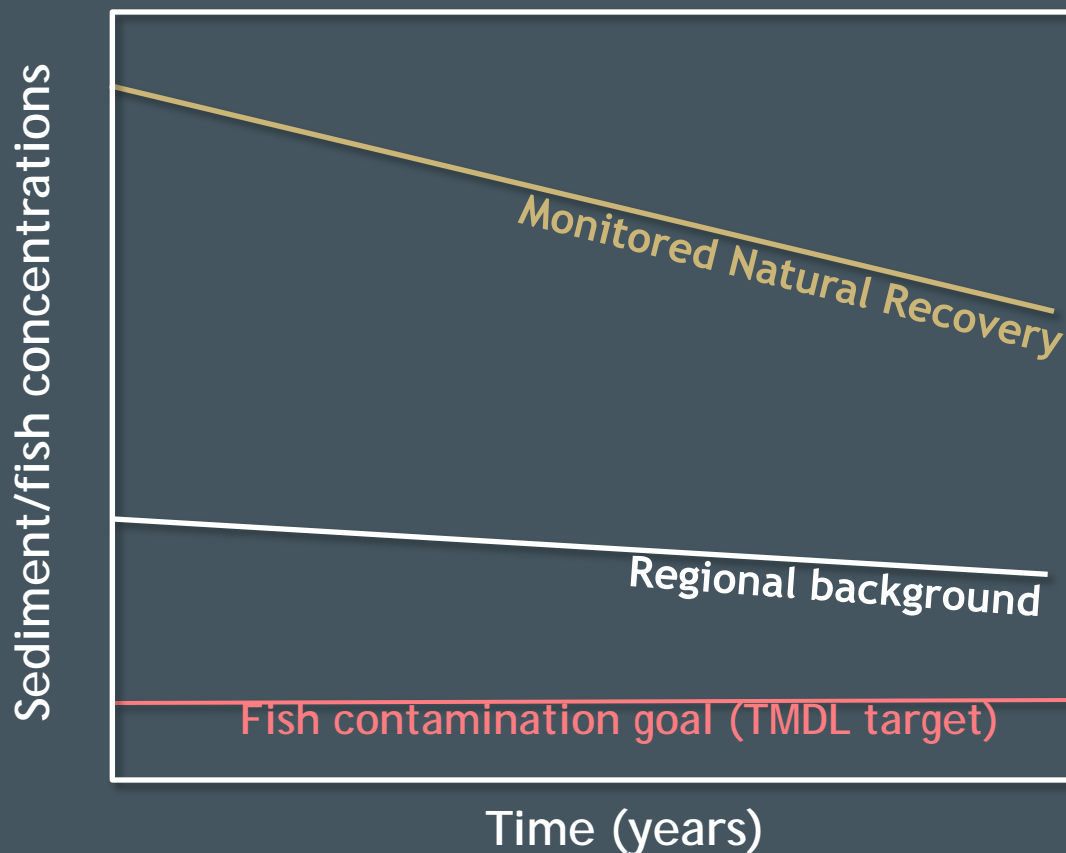
TMDL Process



Questions



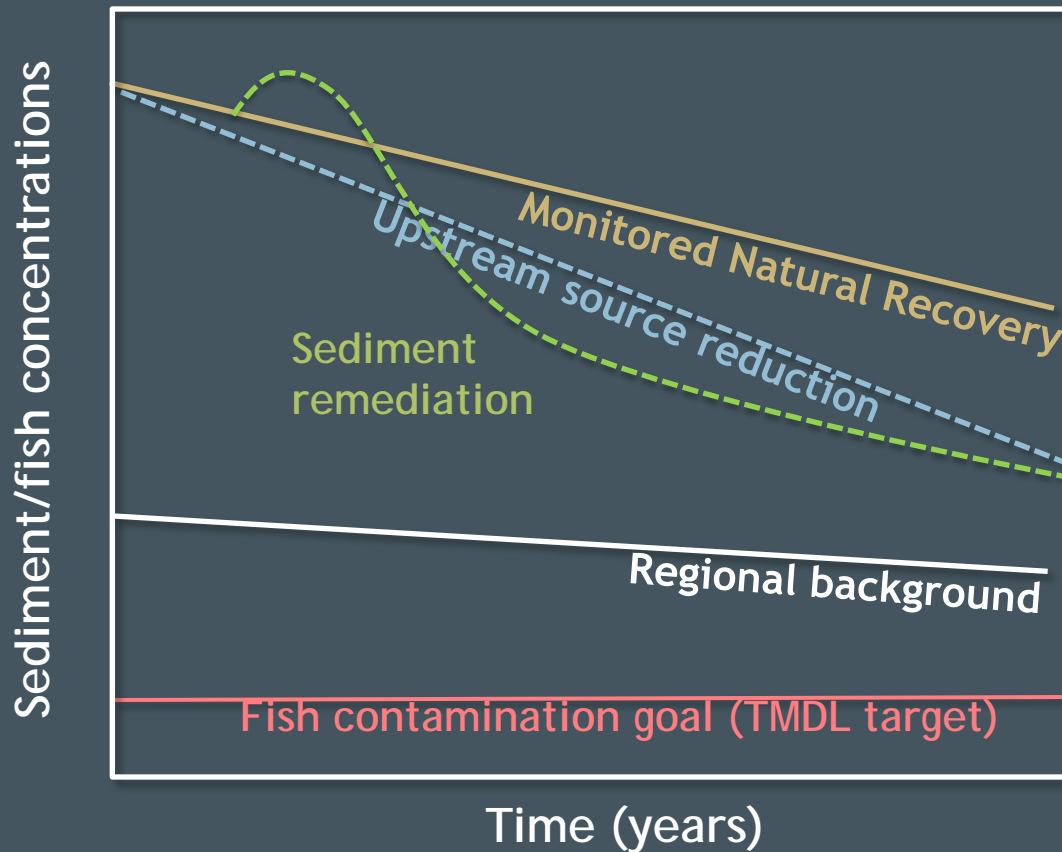
Determining Effective Management Strategies in LA/LB Harbor



Current sediment and fish are above TMDL targets

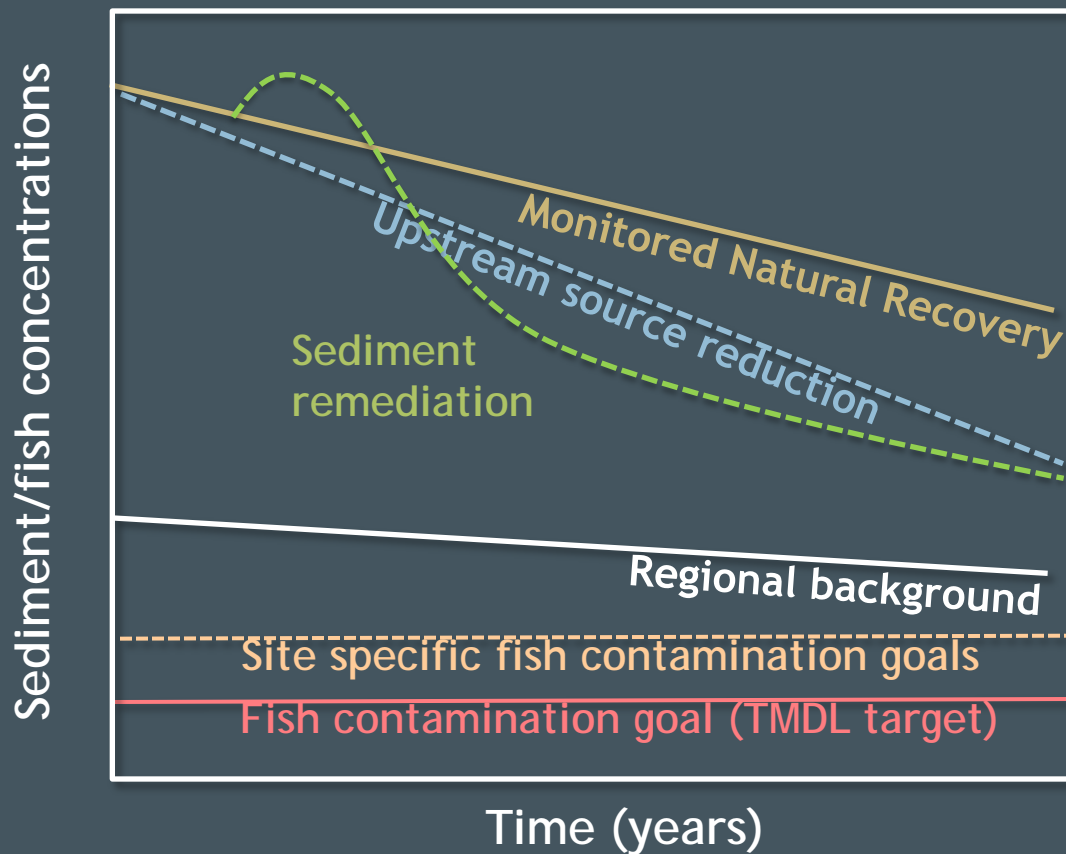
Do nothing – natural recovery, may take hundreds of years

Determining Effective Management Strategies in LA/LB Harbor



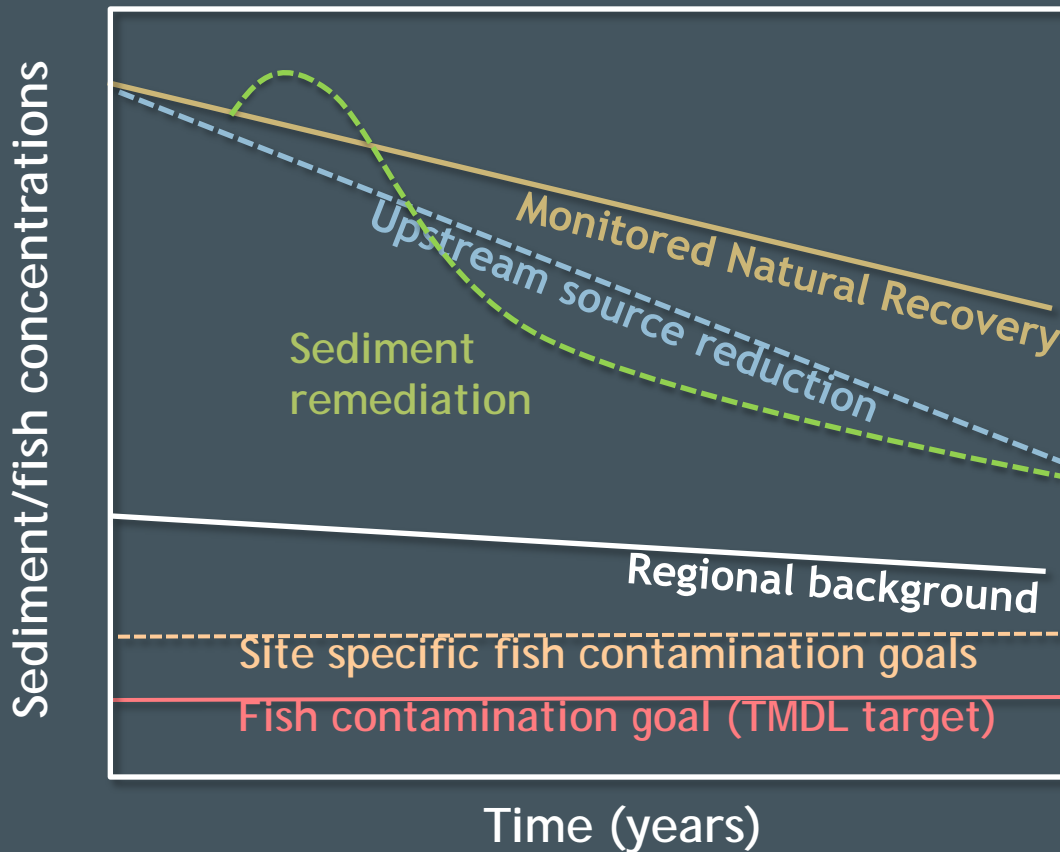
Various management strategies will lower sediment and tissue

Determining Effective Management Strategies in LA/LB Harbor



Revision of targets may shorten time to compliance

Determining Effective Management Strategies in LA/LB Harbor

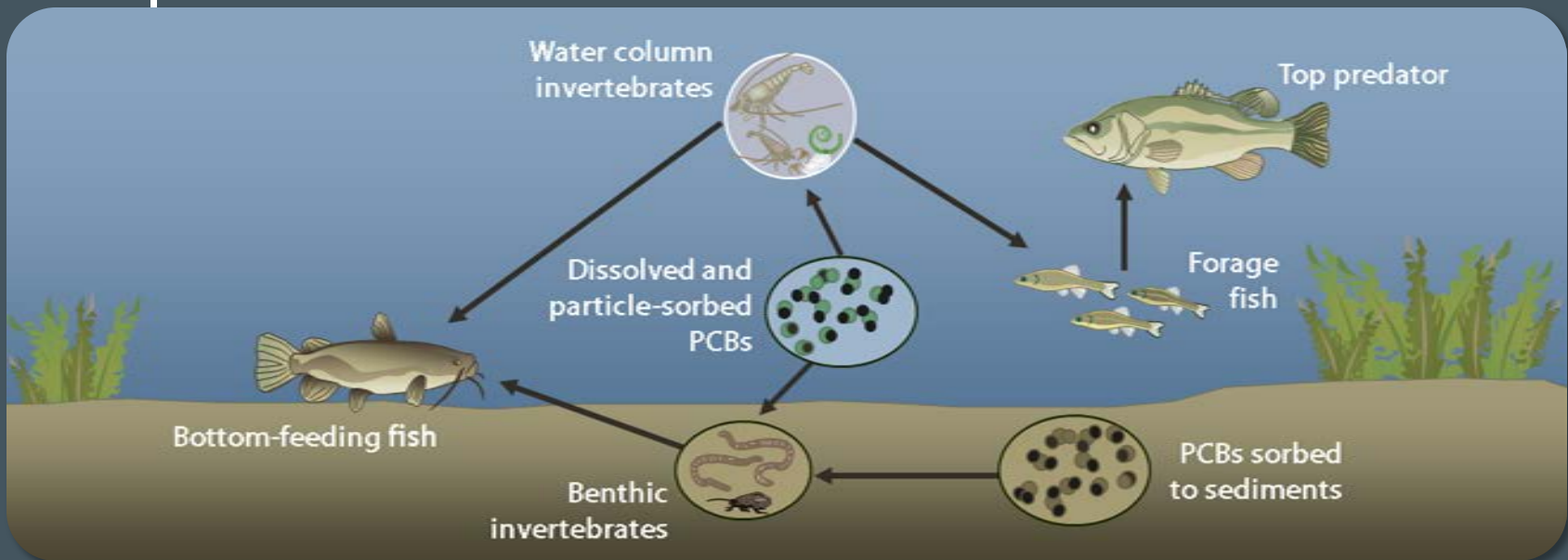


All management strategies are compared and considered. Evaluation includes:

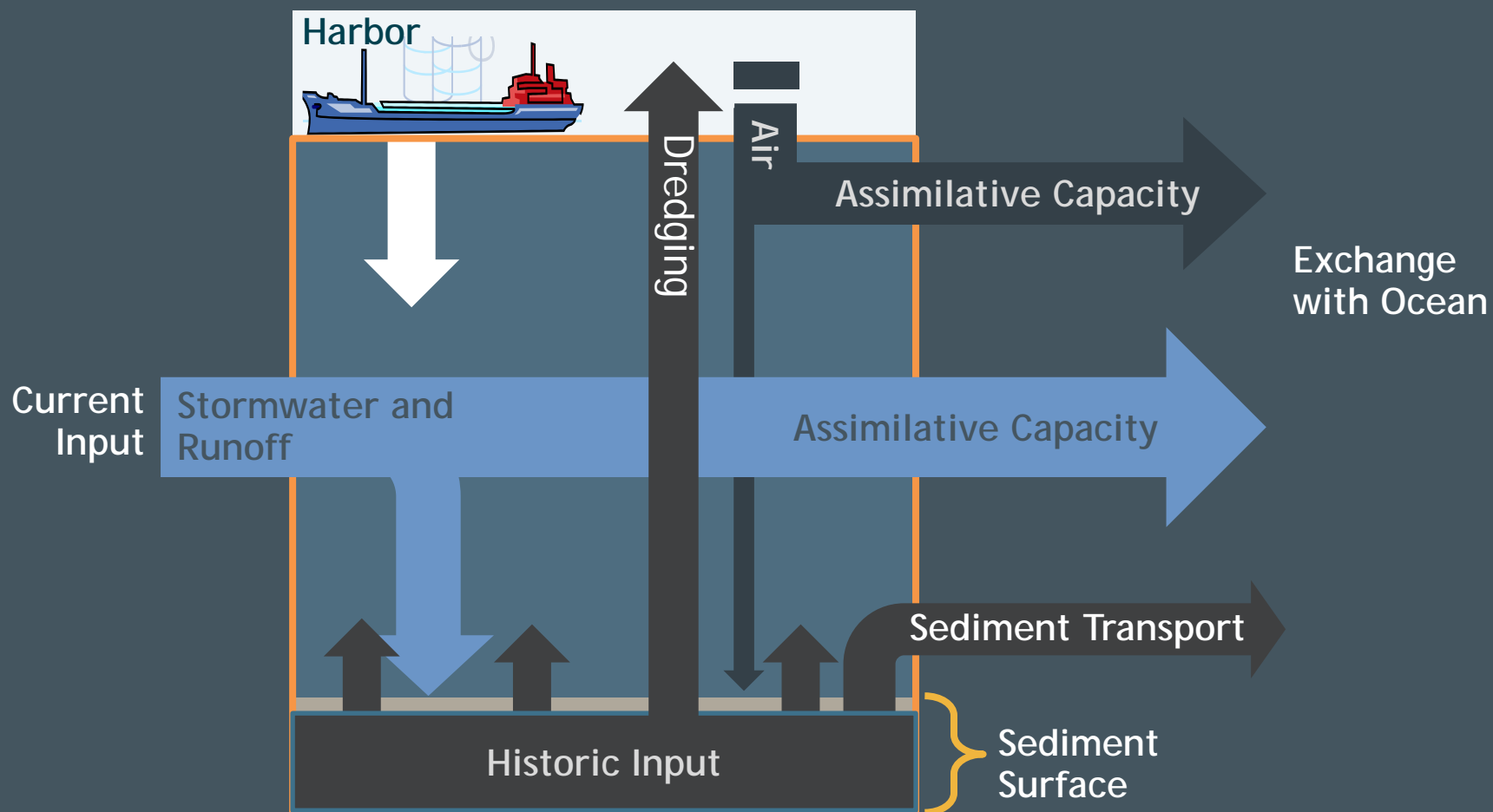
- Technical feasibility
- Logistical feasibility
- Cost/environmental benefit analysis
- Social acceptance

Chemical Sources to Tissue

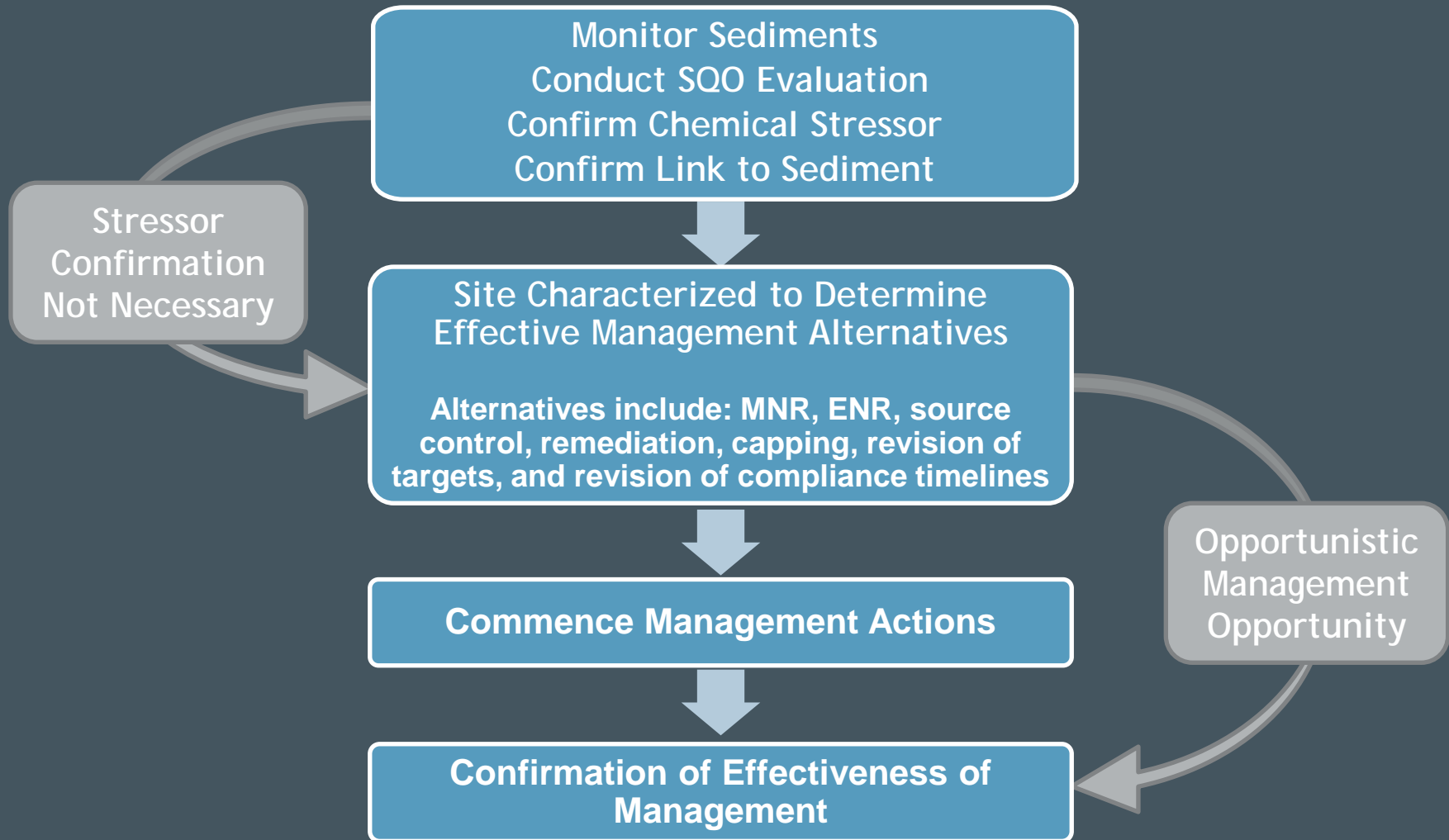
- Includes both local sediments and water



Waterbody



Sediment Management Strategy



Prioritize Management Actions

- Risk-based ranking
 - High levels of impairment
 - Sensitive habitat and species
 - Bioaccumulative contaminants
 - High contaminant mobility
- Logistically feasible
- Economically responsible
 - Alignment with ongoing port development project
 - Low recontamination
 - Measurable improvement

