Tiered Implementation of the Bay TMDL ("Tiered TMDL")

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Tiered Implementation of the TMDL

What Why How

What is Tiered Implementation of the TMDL?

Same destination, different journey

Definition

A tiered implementation of the TMDL establishes intermediate term, spatially explicit pollutant load targets that would result in the greatest anticipated benefit to living resources on our way toward attainment of the Chesapeake Bay water quality standards

Chesapeake Bay Water Quality Goals

Designated Use

Water Quality Criteria

TMDL

Aquatic living resources



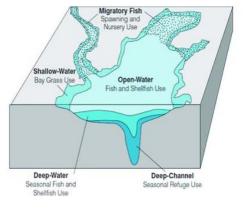
Numeric Criteria within 5 Bay habitats across 92 "segments"

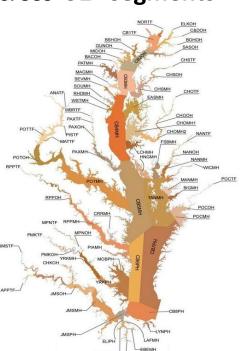
Dissolved Oxygen (DO)

(30 day avg, 7 day avg, instantaneous):

Water Clarity/Aquatic Vegetation

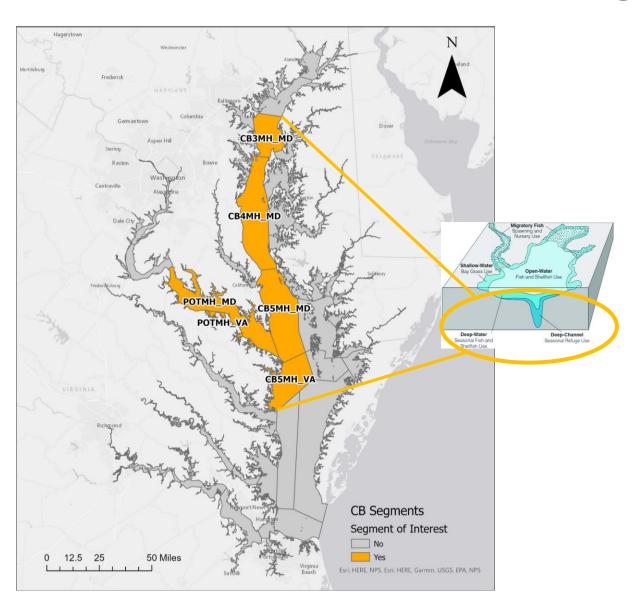
Chlorophyll a (James)





Nitrogen,
Phosphorus,
& Sediment
targets to
meet water
quality
criteria

Existing Approach



Timeline

15 year deadline (with milestones)

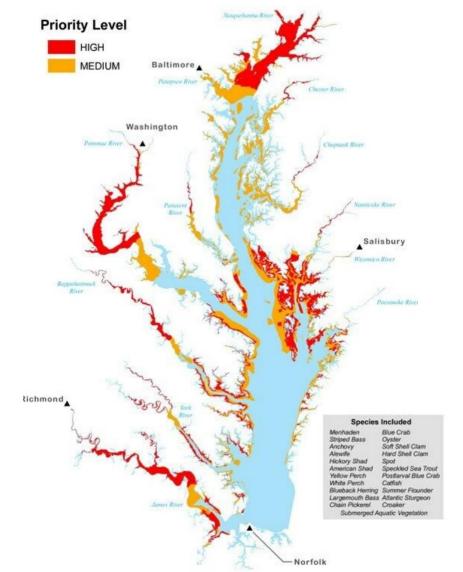
Approach

Nutrient load targets set to 100% WQS, focus on most challenging to achieve: DO criteria in deep water habitats in 4 segments (orange, left).

Nutrient effectiveness across watershed set based on DO impact in these areas (nutrient "currency")

Tiered Approach to Implementation

Example of Prioritization based on potential living resource impact (Source: Chesapeake Bay Program, 2009)



Timeline

Intermediate goal: ex. 10-15 years

Long-term goal: ex. 25-30 years (final goal)

Approach

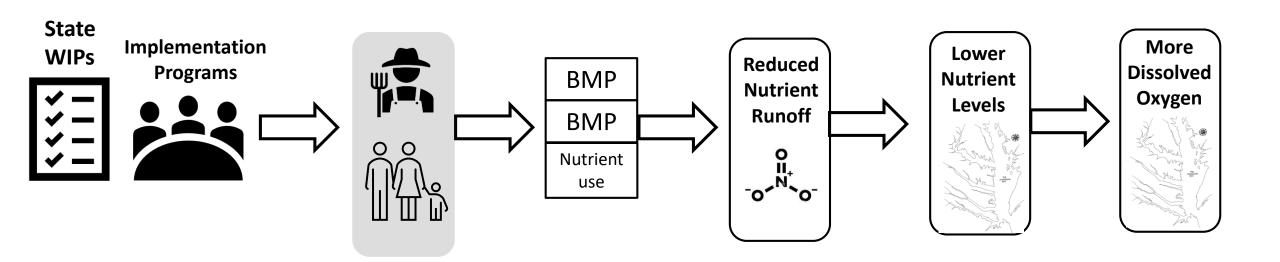
Intermediate nutrient targets based on living resource potential, while acknowledging:

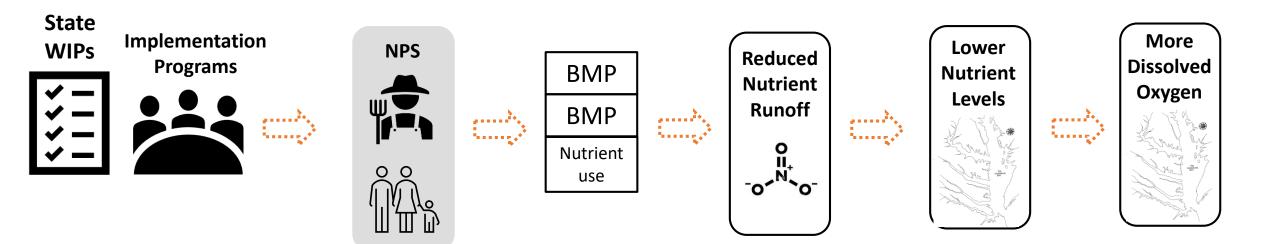
- interdependence across areas (including progress in main channel);
- importance of local, non-WQ living resource factors/stressors.

The "Why" of Tiered Implementation

WQ goals are more difficult and costly to achieve than originally anticipated.

Broadening management focus can accelerate improvements in living resource without "full achievement" of WQS

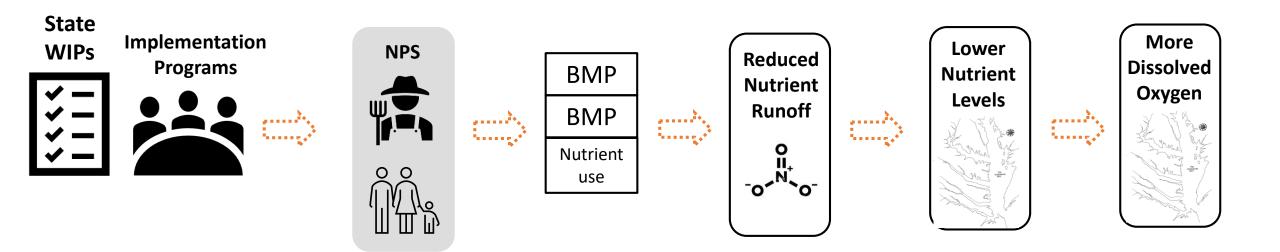




Causal Relationships

Magnitude

Uncertainty



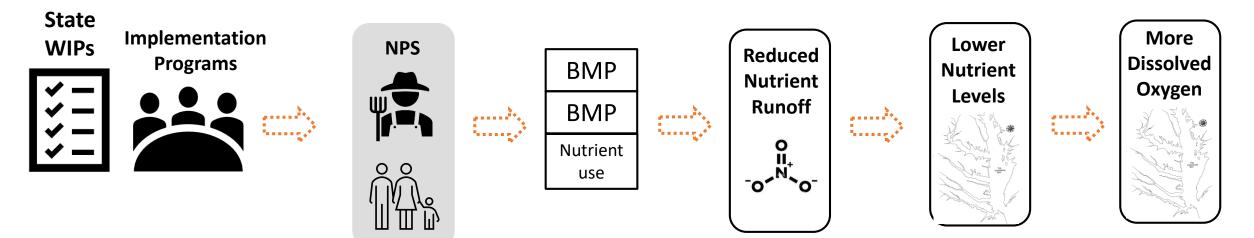
Causal Relationships

Magnitude

~40 Million lbs N reductions still needed

Nonpoint reductions achieved between 2009-2023 (<1 million lbs, modeled loads)

Uncertainty

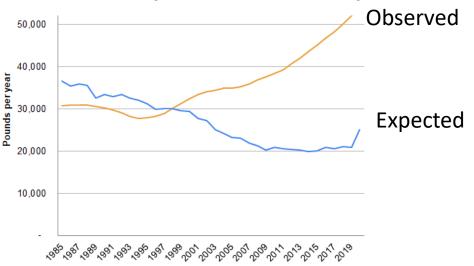


Causal Relationships

Magnitude

Uncertainty

Total Phosphorus Loads, Choptank



Shifting the Focus of the Journey

Designated Use

Protect aquatic living resources



Water Quality Criteria

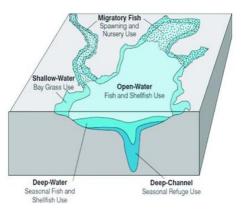
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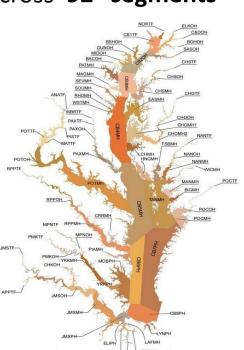
Dissolved Oxygen (DO)

(30 day avg, 7 day avg, instantaneous):

Water Clarity/Aquatic Vegetation

Chlorophyll a





TMDL

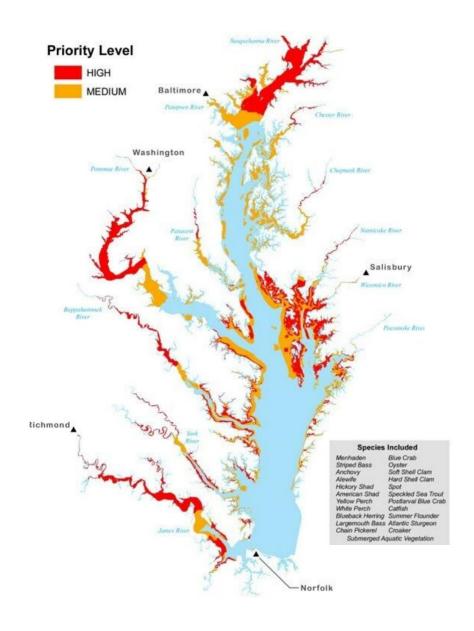
Nitrogen,
Phosphorus,
& Sediment
targets to
meet water
quality
criteria

Summary of the "Why" of Tiered Implementation

Long and arduous journey to the final destination

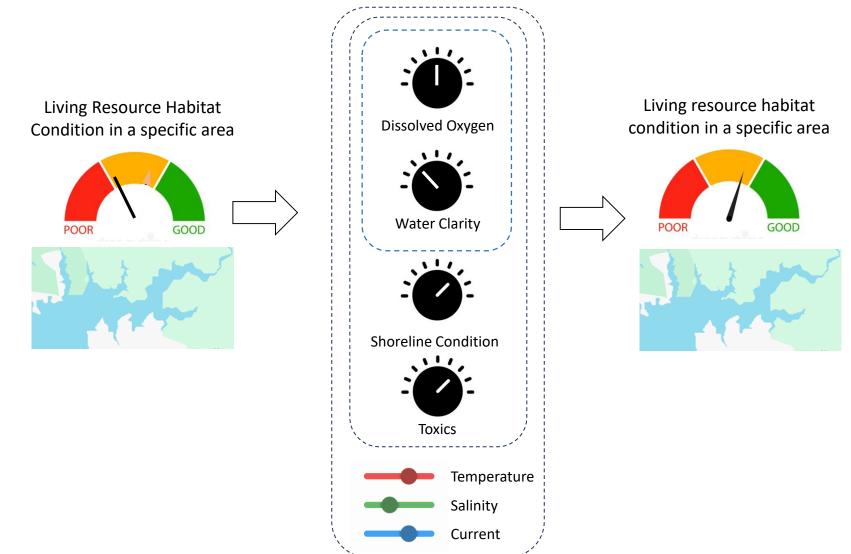
Do more good along the way

The How of Tiered Implementation



Developing intermediate goals to maximize living resource response

Factors influencing habitat of Bay Living Resources



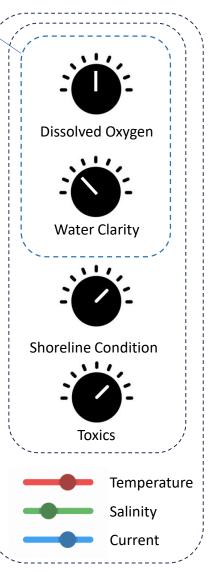
Spatially Focus nutrient reductions
Address Local & Regional influences

Factors influencing habitat of Bay Living Resources

Living Resource Habitat Condition in a specific area







Living resource habitat condition in a specific area





Thank you