Chesapeake Bay Program
Science. Restoration. Partnership.

Foundations for Planning Targets

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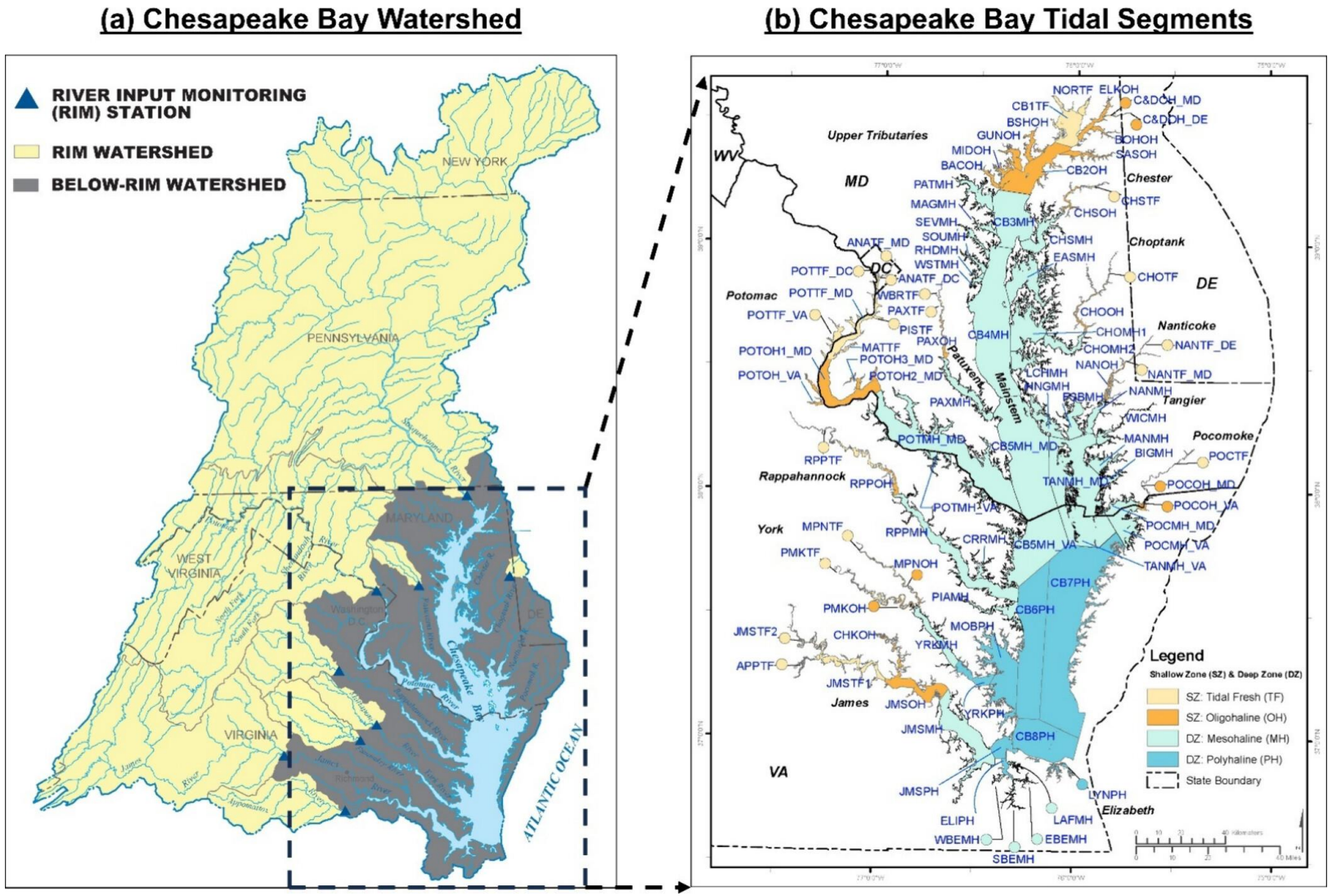
1-26-26

Water Quality Goal Implementation Team

Chesapeake Bay Tidal Segments (n = 92)



Zhang et al., 2024

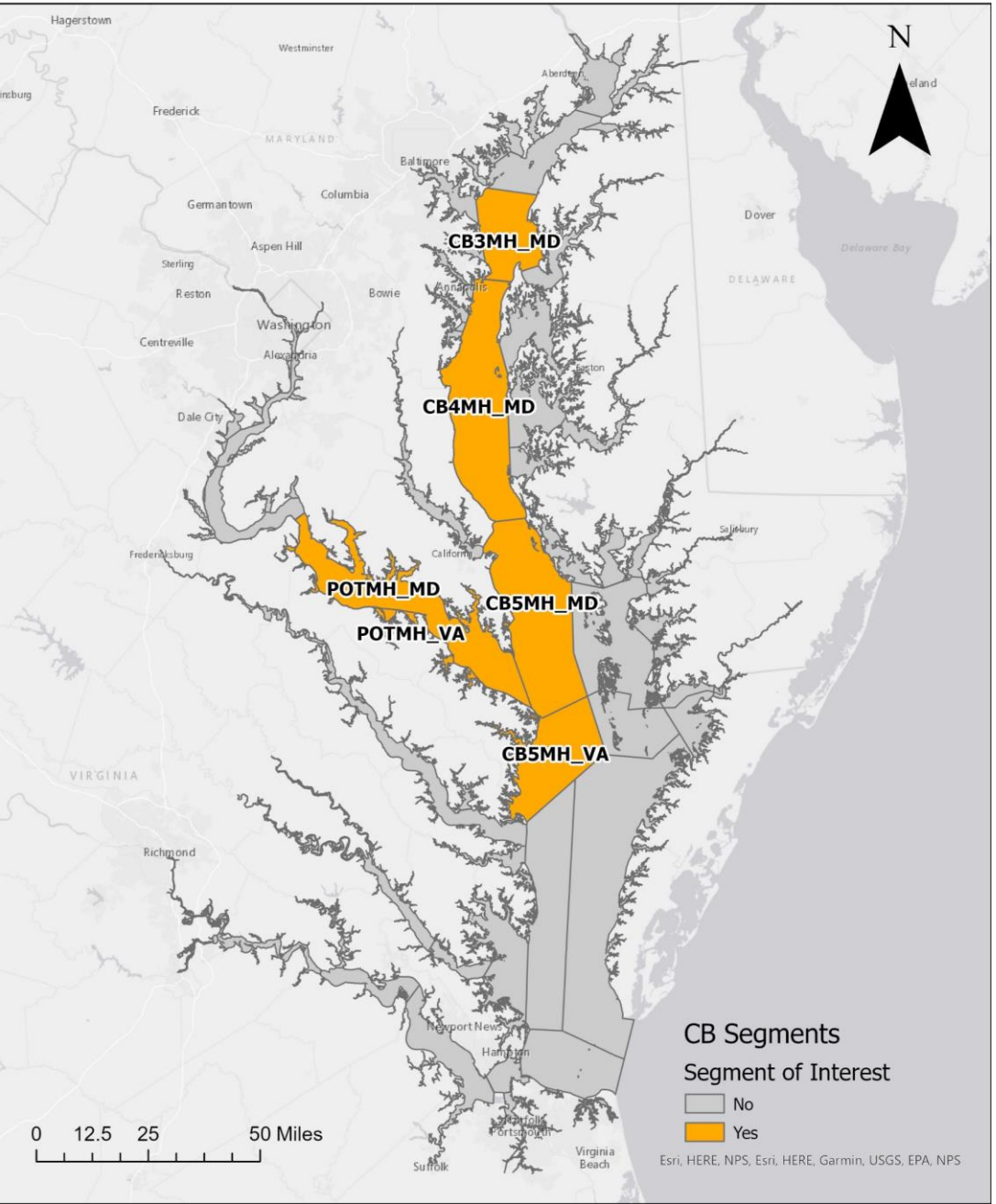
Table 1. Chesapeake Bay dissolved oxygen criteria.

Designated Use	Criteria Concentration/Duration	Protection Provided	Temporal Application
Migratory fish spawning and nursery use	7-day mean $\geq$ 6 mg liter^{-1} (tidal habitats with 0-0.5 ppt salinity)	Survival/growth of larval/juvenile tidal-fresh resident fish; protective of threatened/endangered species.	February 1 - May 31
	Instantaneous minimum $\geq$ 5 mg liter^{-1}	Survival and growth of larval/juvenile migratory fish; protective of threatened/endangered species.	
	Open-water fish and shellfish designated use criteria apply		June 1 - January 31
Shallow-water bay grass use	Open-water fish and shellfish designated use criteria apply		Year-round
Open-water fish and shellfish use	30-day mean $\geq$ 5.5 mg liter^{-1} (tidal habitats with 0-0.5 ppt salinity)	Growth of tidal-fresh juvenile and adult fish; protective of threatened/endangered species.	Year-round
	30-day mean $\geq$ 5 mg liter^{-1} (tidal habitats with >0.5 ppt salinity)	Growth of larval, juvenile and adult fish and shellfish; protective of threatened/endangered species.	
	7-day mean $\geq$ 4 mg liter^{-1}	Survival of open-water fish larvae.	
	Instantaneous minimum $\geq$ 3.2 mg liter^{-1}	Survival of threatened/endangered sturgeon species.[1]	
Deep-water seasonal fish and shellfish use	30-day mean $\geq$ 3 mg liter^{-1}	Survival and recruitment of bay anchovy eggs and larvae.	June 1 - September 30
	1-day mean $\geq$ 2.3 mg liter^{-1}	Survival of open-water juvenile and adult fish.	
	Instantaneous minimum $\geq$ 1.7 mg liter^{-1}	Survival of bay anchovy eggs and larvae.	
	Open-water fish and shellfish designated-use criteria apply		October 1 - May 31
Deep-channel seasonal refuge use	Instantaneous minimum $\geq$ 1 mg liter^{-1}	Survival of bottom-dwelling worms and clams.	June 1 - September 30
	Open-water fish and shellfish designated use criteria apply		October 1 - May 31

[1] At temperatures considered stressful to shortnose sturgeon (>29°C), dissolved oxygen concentrations above an instantaneous minimum of 4.3 mg liter^{-1} will protect survival of this listed sturgeon species.

From EPA 2003 Ambient Water Quality Criteria

Chesapeake Bay Segments 3, 4, 5, and Potomac Mesohaline



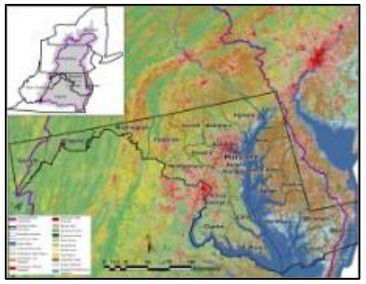
Goal: Meet WQ Standards in Deep-Water/Deep Channel

- Critical segments listed below were along the last to come into attainment
- Deep Channel
  - CB3MH
  - CB4MH
  - and CB5MH for deep-channel and
- Deep-Water
  - CB3MH
  - CB4MH
  - CB5MH
  - POTMH

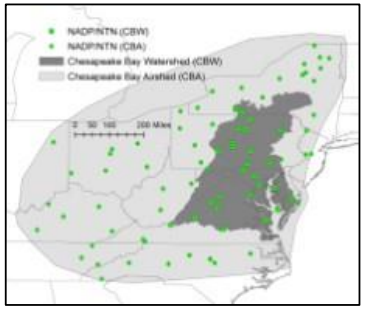
Bay TMDL, Section 6

Data and Model Inputs

BMP Data
Land Use Data
Point Sources Data
Septic Data
U.S. Census Data
Agricultural Data



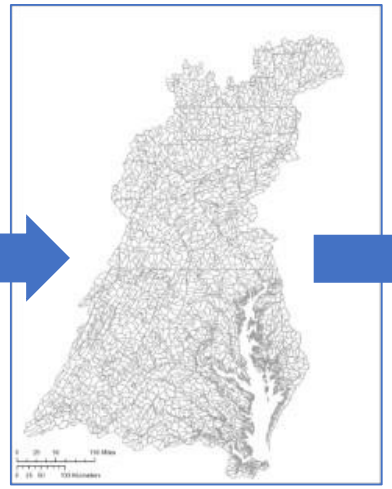
Land Use Change Model



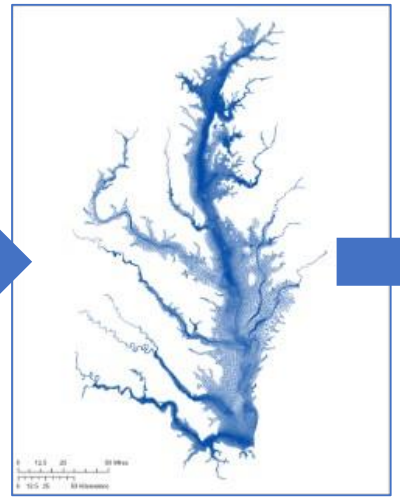
Airshed Model

Precipitation Data
Meteorological Data
Elevation Data
Soil Data

Phase 7 Watershed Model/CAST



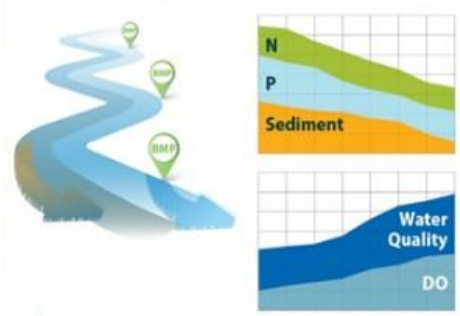
Estuary Model



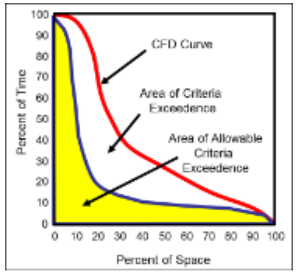
Model Outputs

Prediction of Impacts

BMP Implementation Results



Criteria Assessment Procedures



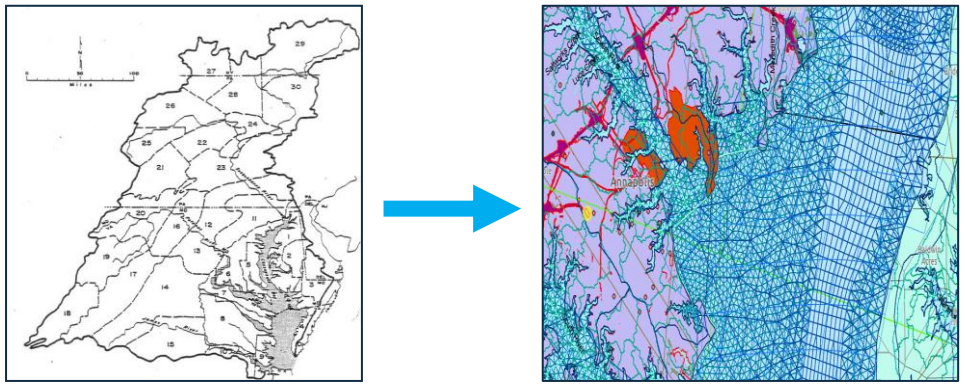
Nutrient and sediment targets for CBP state and Federal partnership

Effects

Targets

Models Have Grown with the Partnership

- The Watershed Model, which is one of the many interrelated pieces of the suite of modeling tools the CBP partnership uses



Time	Version	Scenarios
Mid 1980s		0
Early 1990s	Phase 2	<10
Late 1990s	Phase 4.1	37
Early 2000s	Phase 4.3	400+
2009 – 2010	Phase 5.3.0	300+
2011 – 2017	Phase 5.3.2	1000 or so
2017-2028	Phase 6	1000s per year
2028	Phase 7	Many more…

Planning Target Evolution

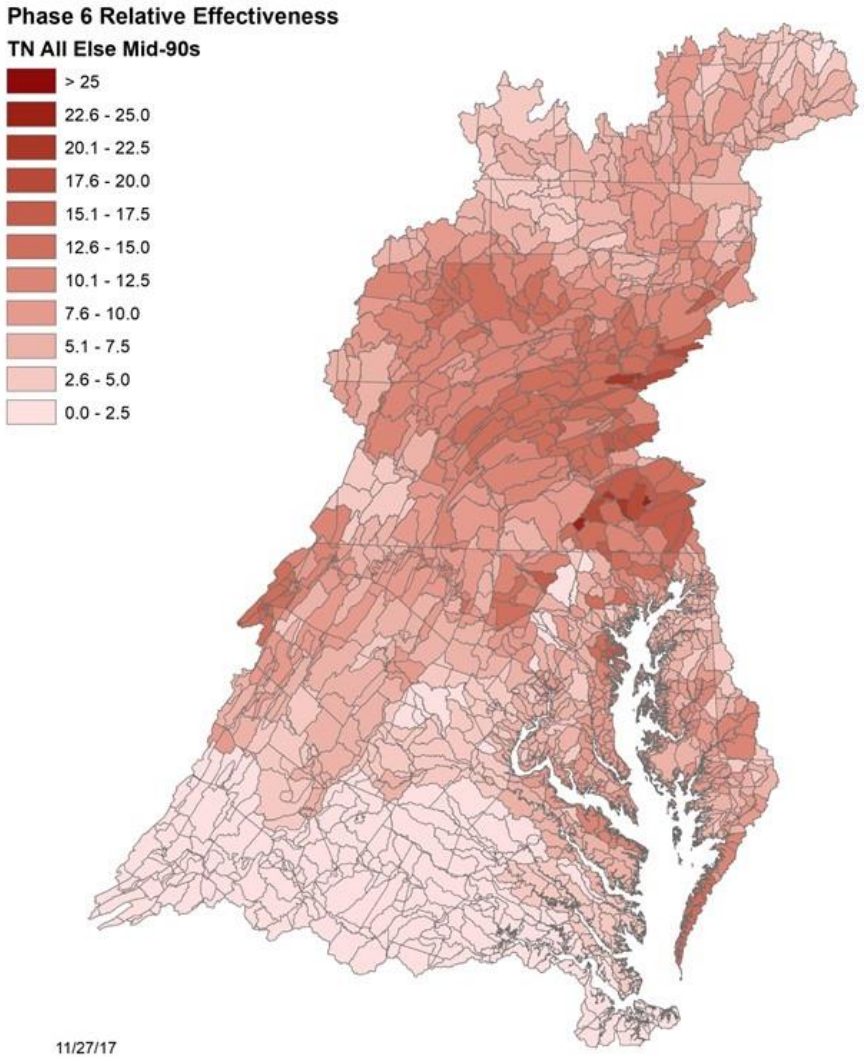
Year	Model Phase	Goal
1987	0	40% Reduction
1992	2	40% of Controllable Loads
1997	4.1	Confirm 1992 Loads
2003	4.3	Reallocation
2010	5.3.0	Bay TMDL
2011	5.3.2	Phase 2 WIP Targets
2017	6.0	Phase 3 WIP Targets

Three Partnership Principles

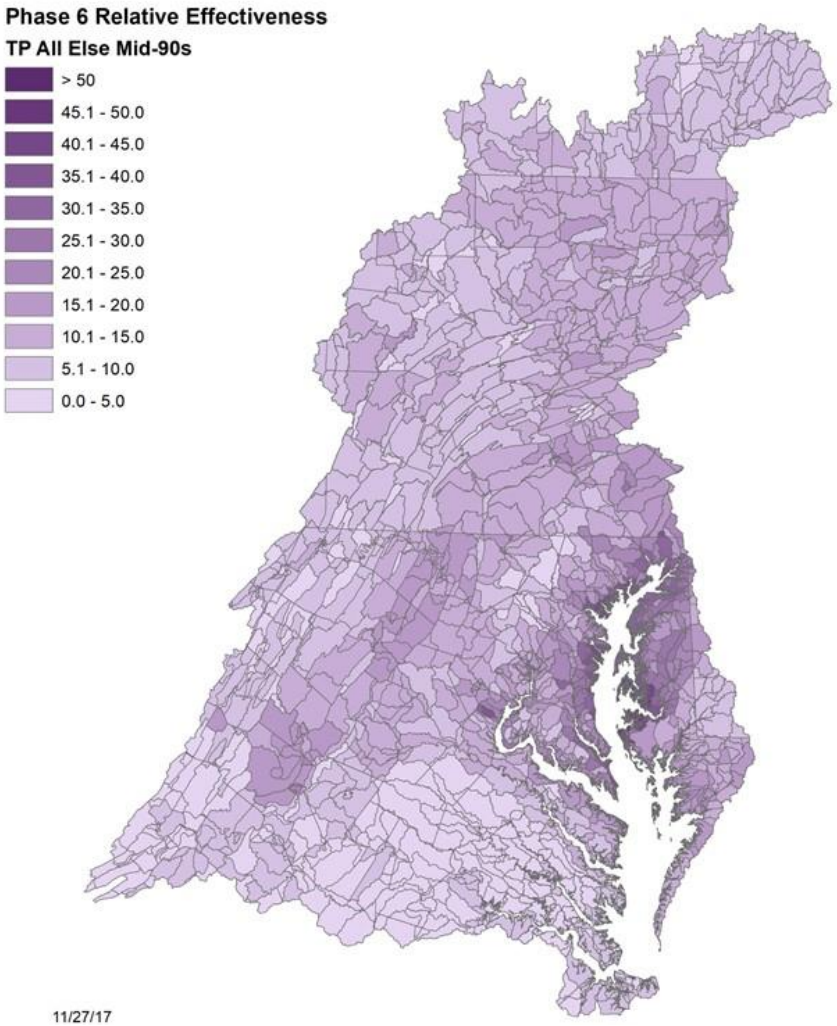
- Allocated loads must result in achievement of the states' Bay water quality standards
- Major river basins that contribute the most to Bay water quality problems must do the most to resolve those problems
- All tracked and reported reductions in loads are credited toward achieving assigned loads

More Impact, Do More

Phase 6 Nitrogen



Phase 6 Phosphorus



Looking forward--what's next?

- Planning targets—deeper dives on related topics (WQGIT)
- Defining scenarios (E3, No Action, and others) needed for Phase 7 review and setting planning targets
  - Sector workgroup meetings scheduled (USWG, Ag, WW, Forestry)
- Tiered targets = additional options for implementation prioritization
  - Keep planning target default as is, prioritize, in time, based on living resources needs
- Setting longer-term timeline, milestones, decision points
  - 2026-2027: Method review & development
  - 2027/2028: Draft planning targets
  - 2028: Final planning targets