Using Adaptive Management in the Chesapeake Bay Program

Chesapeake Bay Program
A Watershed Partnership

Citizens Advisory Committee Meeting
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Today we will cover:

Using Water Quality and SAV as Examples:

- What is adaptive management?
- Why are we trying to do this? Or Aren't we doing this already?
- How will it help achieve our goals and accelerate implementation?

What Is Adaptive Management?

Adaptive management is

- Is an approach to ecological management.
- Is based upon the premise that managed ecosystems are complex and inherently unpredictable.
- Accepts the uncertainty that exists in the real world rather than ignoring it.

Consequently adaptive management

- Views management actions as experiments rather than solutions.
- Is a structured process that reduces the costs of management experiments while increasing opportunities for social learning.

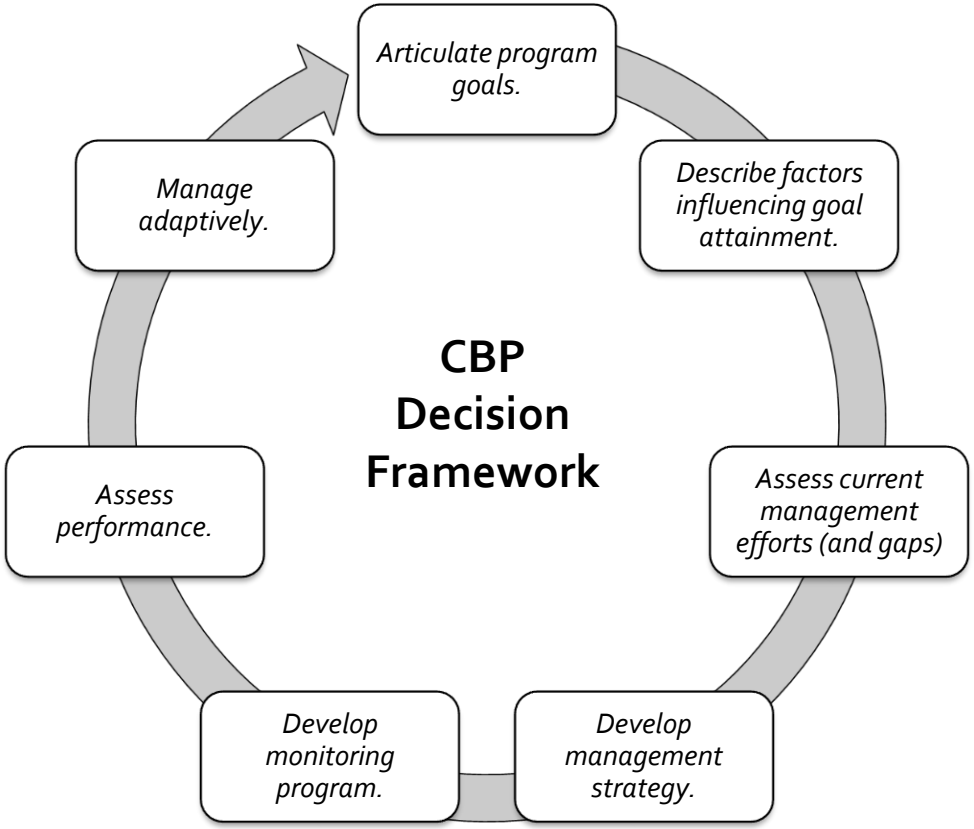
Reference: WordIQ

Adaptive Managment

Applying the Decision Framework to Attaining Water Quality Standards in the Chesapeake Bay and Its Tidal Tributaries

CBP Water Quality Goal Implementation Team

Published: July 16, 2012



http://www.chesapeakebay.net/publications/title/applying_the_decision_framework_to_attaining_water_quality_standards_in_the

Why Are We Doing This?

- The Chesapeake Bay is a large complex ecosystem with unpredictable natural factors that influence our ability to meet goals
- We collect a large body of monitoring and assessment information that we can use better to learn more and become more efficient
- The more we learn about the success of our management actions, the more effective we will become

Adaptive Management process allows for:

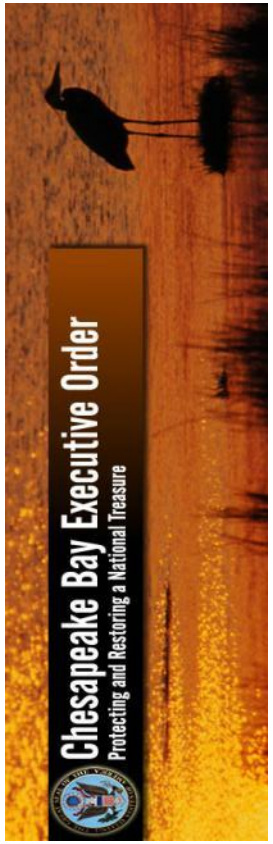
- A better articulation of goals and outcomes
- A more rigorous focus on management strategies based on all major factors that can influence our ability to meet our goals
- A more accountable system of tracking our progress
- A better understanding of when we need to change our approaches based on system response

Aren't We Doing This Already?

- We have many of the pieces necessary to do adaptive management
- We are doing some aspects of adaptive management now
- We need to tighten up how we are using all of our tools to get the most out of adaptive management

Restore Clean Water

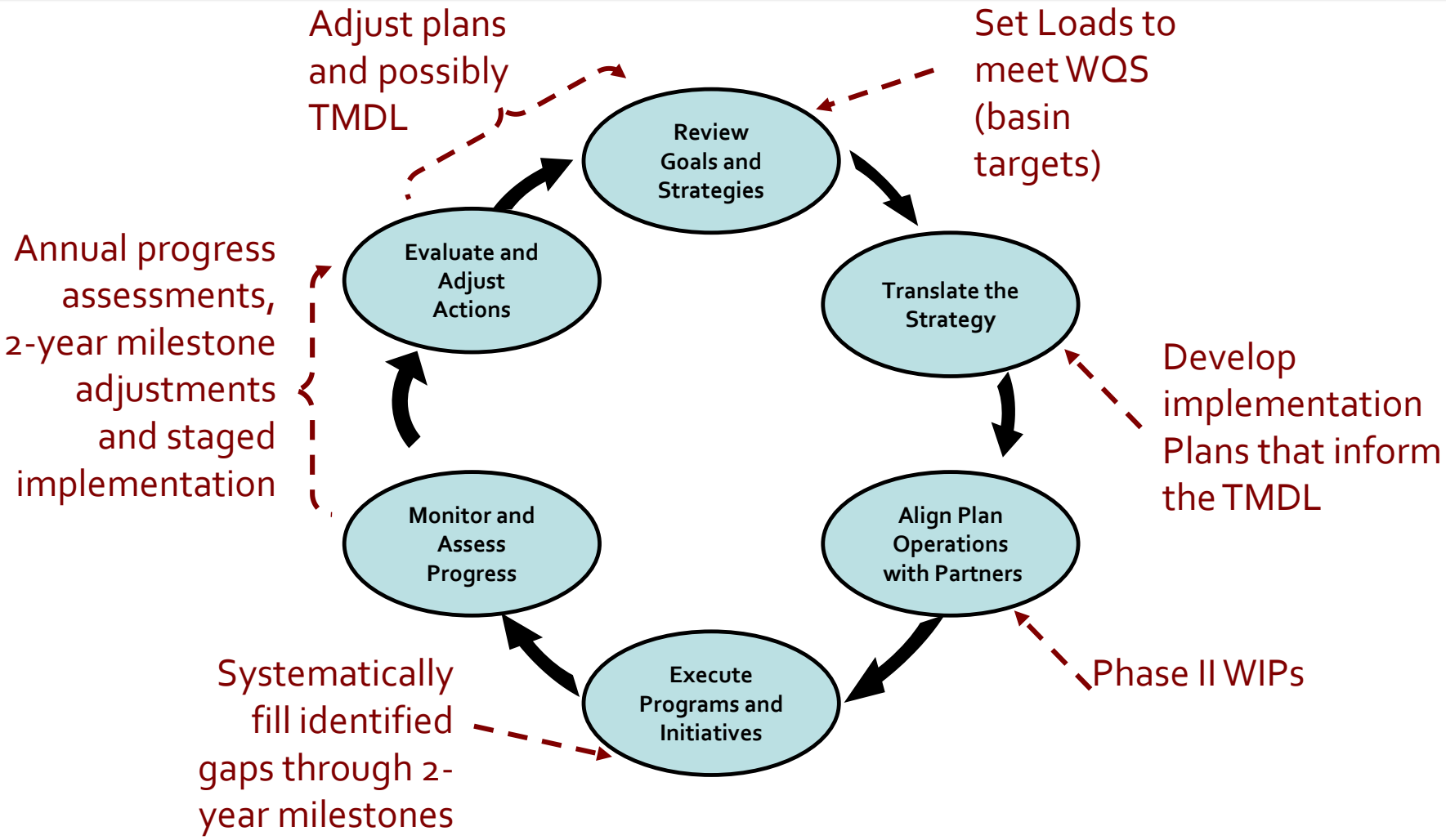
Goal:
Reduce nitrogen, phosphorus, sediment and other pollutants to meet Bay water quality goals for dissolved oxygen, clarity, chlorophyll-a and toxic contaminants.



OUTCOMES

Water Quality Meet water quality standards for dissolved oxygen, clarity/underwater grasses and chlorophyll-a in the Bay and tidal tributaries by implementing 100 percent of pollution reduction actions for nitrogen, phosphorus and sediment no later than 2025, with 60 percent of segments attaining water quality standards by 2025. *(Current condition: 89 of the 92 segments of the Bay and its tidal waters are impaired.)*

How Are We Addressing Adaptive Management?



Source: Shared almost identical slide with the WQSC in July 2009

Influencing Factors

1. Pollutant Loads
   - Fertilizer, manure, bio-solids on land
   - Mobilized sediments
   - Air deposition
2. Natural and human mitigating factors
   - Riparian buffers, wetlands
   - Natural hydrological conditions
   - Ag BMP implementation
   - Wastewater and stormwater management
   - Air pollution control

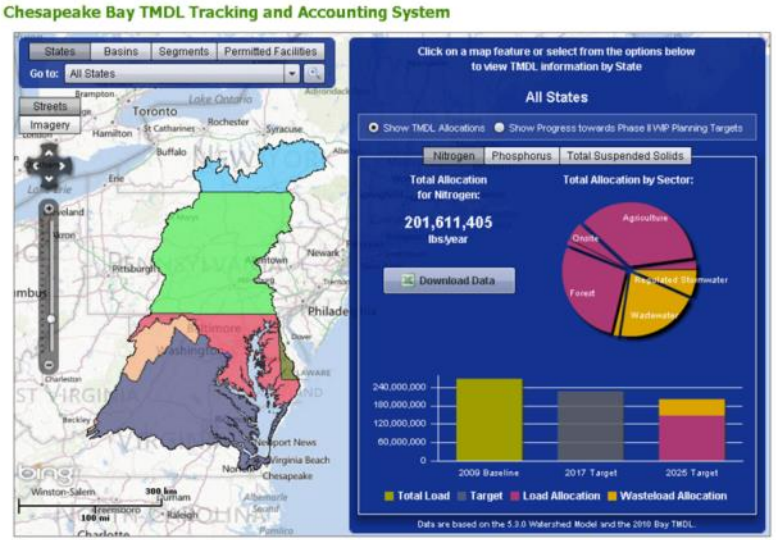
Influencing Factors

3. Ecosystem responses to changes in pollutant loads
4. Climate Change
   - Altered precipitation
   - Temperature
   - Sea level rise
   - Increased storm frequency and intensity

Management Efforts

CURRENT EFFORTS

- Bay TMDL
  - Load reduction
  - Enhanced mitigation of delivered loads
- Accountability Framework

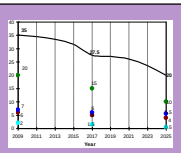


http://stat.chesapeakebay.net/?q=node/130&quicktabs_10=2

Components of the Bay TMDL Accountability Framework

1. Watershed Implementation Plans identify nutrient and sediment targets that meet water quality standards.

2. 2-Year Milestones with programmatic and pollutant reduction commitments



3.Track and Assess Progress implementing WIPs and milestones

4. Federal Actions if insufficient Watershed Implementation Plans or 2-year milestones

Source: Chesapeake Bay TMDL Section 7

Gaps

- Cannot manage ecosystem responses to load changes
- Not accounting for climate changes effects on existing management efforts
- Local scale load assessments
- BMP verification
- Capacity

Monitoring

- BMP tracking with modeling of potential impacts
- Monitoring of desired water quality outcome
- Assessment of assumptions
  - Are BMPs performing as modeled?
  - Is climate change not impacting BMP performance?

Assessing Performance

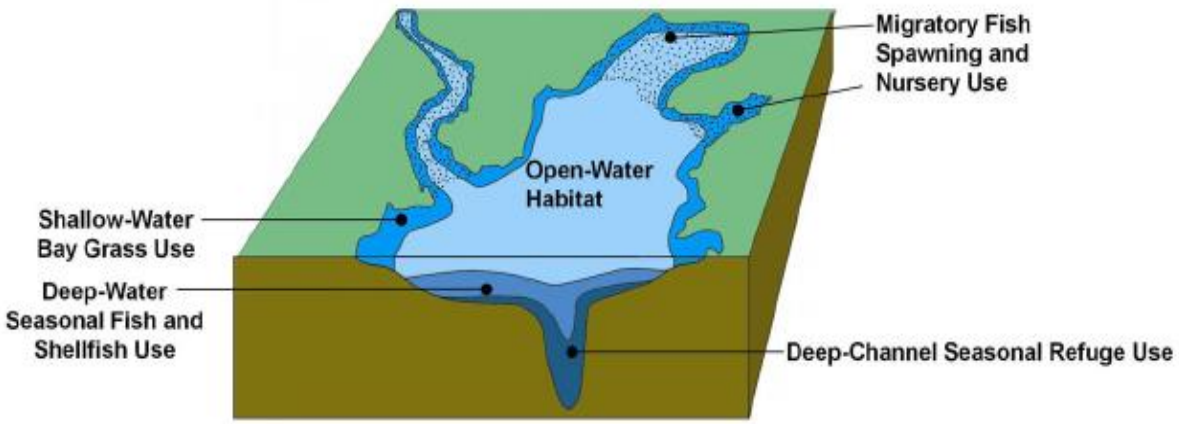
- 100% BMP implementation by 2025
- 60% attainment by 2025

- Water Quality Indicator
  - Metric for monitoring desire outcome
  - Useful for establishing interim goals

Water Quality Indicator

Purpose:
To measure progress toward the achievement of Chesapeake Bay water quality standards.

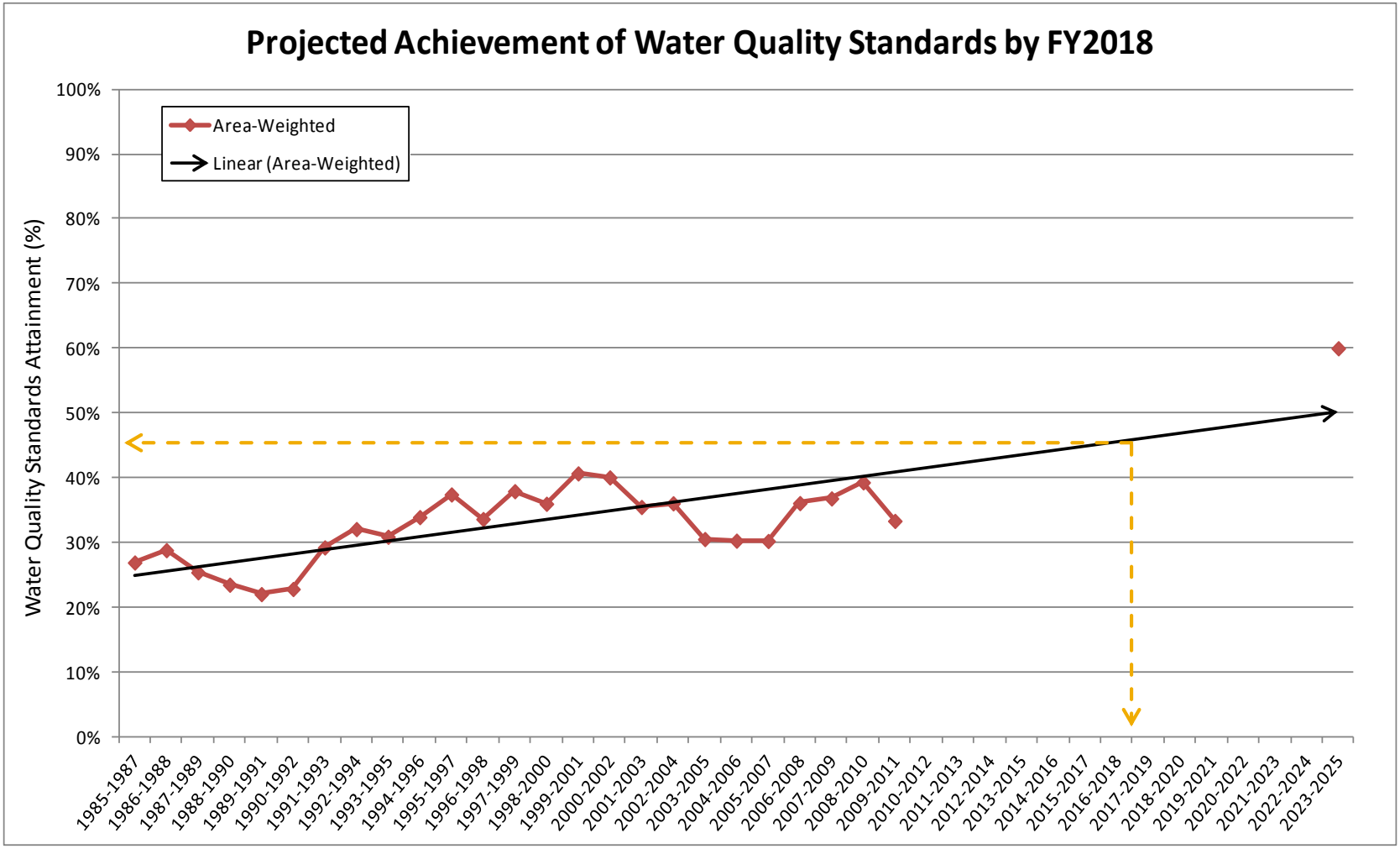
- 92 TMDL segments
- 291 designated-use segments
- Weighted, area-based approach



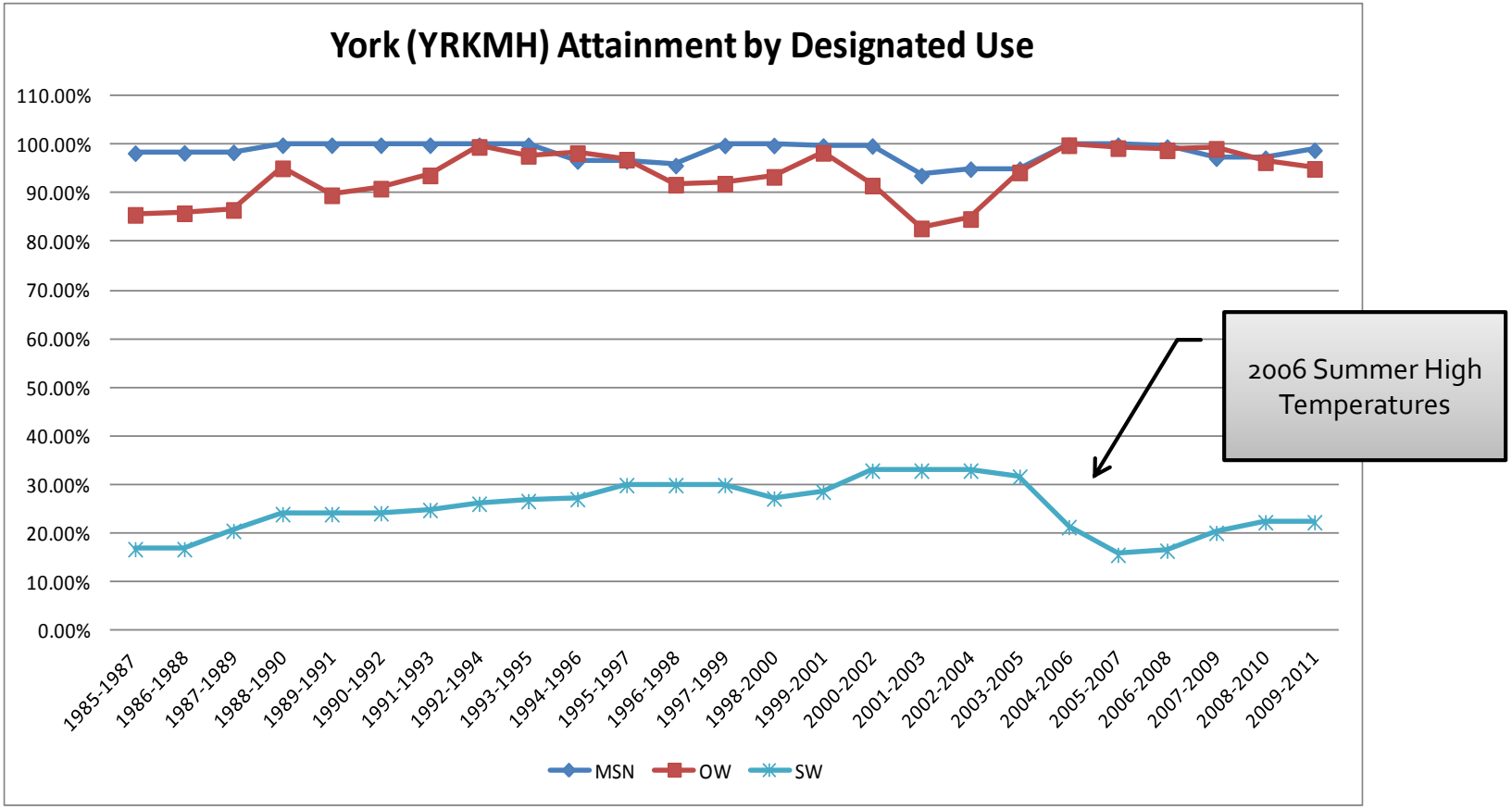
Setting Interim Expectations

- Assume validation of the umbrella criteria
  - Fully assess attainment across all segments, uses and criteria
- Value based on
  - An evaluation of the 1985-2011 time series of criteria attainment; and
  - Driving towards 60% attainment by 2025 as the current end point

FY2018 Target

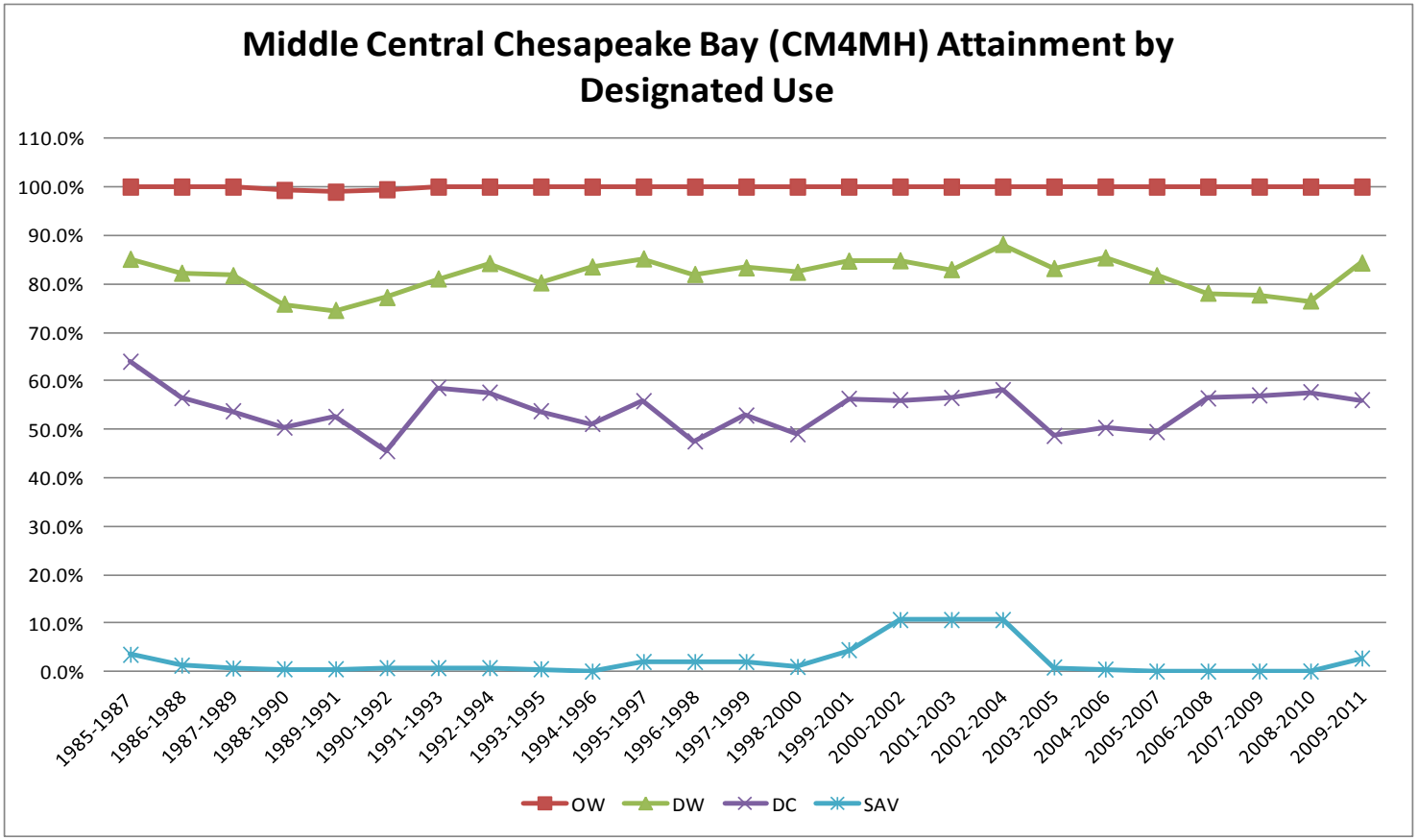


Virginia Lower York River



Improving trend in shallow-water Bay grasses WQS attainment through 2005; then 2006 summer high temperatures depleted eelgrass populations, which have yet to recover fully.

Middle Central Chesapeake Bay



No noticeable trends in deep water and deep channel designated use criteria attainment over time. Consistent with WQSTM findings: Need an additional 20-30+ mil. lbs more N reduction to effectively reduce abundant algal populations.

Continuing Efforts

- Establish an acceptable range based on our current level of knowledge and uncertainty to inform us –
  - At what point is our understanding is compromised?
  - At what point should we reconsider our assumptions?

Adaptive Management

- Improve capacity to attain original goal

1. Adjust current efforts to account for reduced uncertainties via new insights

Adaptive Management

- Informed adjustments based on:
  - Needs to improve monitoring
  - Proper understanding of the system
- Re-evaluation of 2025 Water Quality Outcome

Special Thanks to:

- Liza Hernandez, University of Maryland Center for Environmental Science

- Carl Hershner, Virginia Institute of Marine Sciences

Questions?