

Partnership Approach to Optimization of the Chesapeake Bay Program's Bay and Basin Water Quality Monitoring Program: Process Review and Lessons Learned

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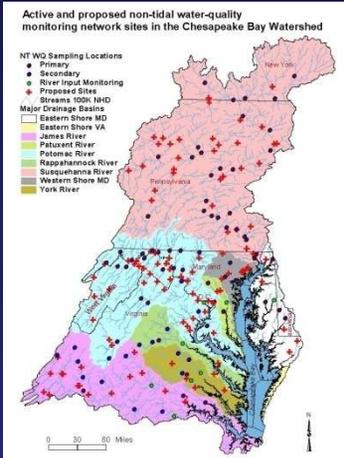
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Kirk Havens, Scott Phillips, Jeni Keisman, Katie Foreman, Jackie
Johnson and Richard Batiuk



Chesapeake Bay Program Bay/Basin Water Quality Monitoring Optimization: The Monitoring Realignment

- Chesapeake Bay and Basin Monitoring Program Overview
- Monitoring Program Review Process
 - Phase I
 - Phase II
- Lessons Learned

Overview of the Chesapeake Bay Program Monitoring Networks



Watershed Monitoring



Bay Water Quality Monitoring



Shallow Water Habitat

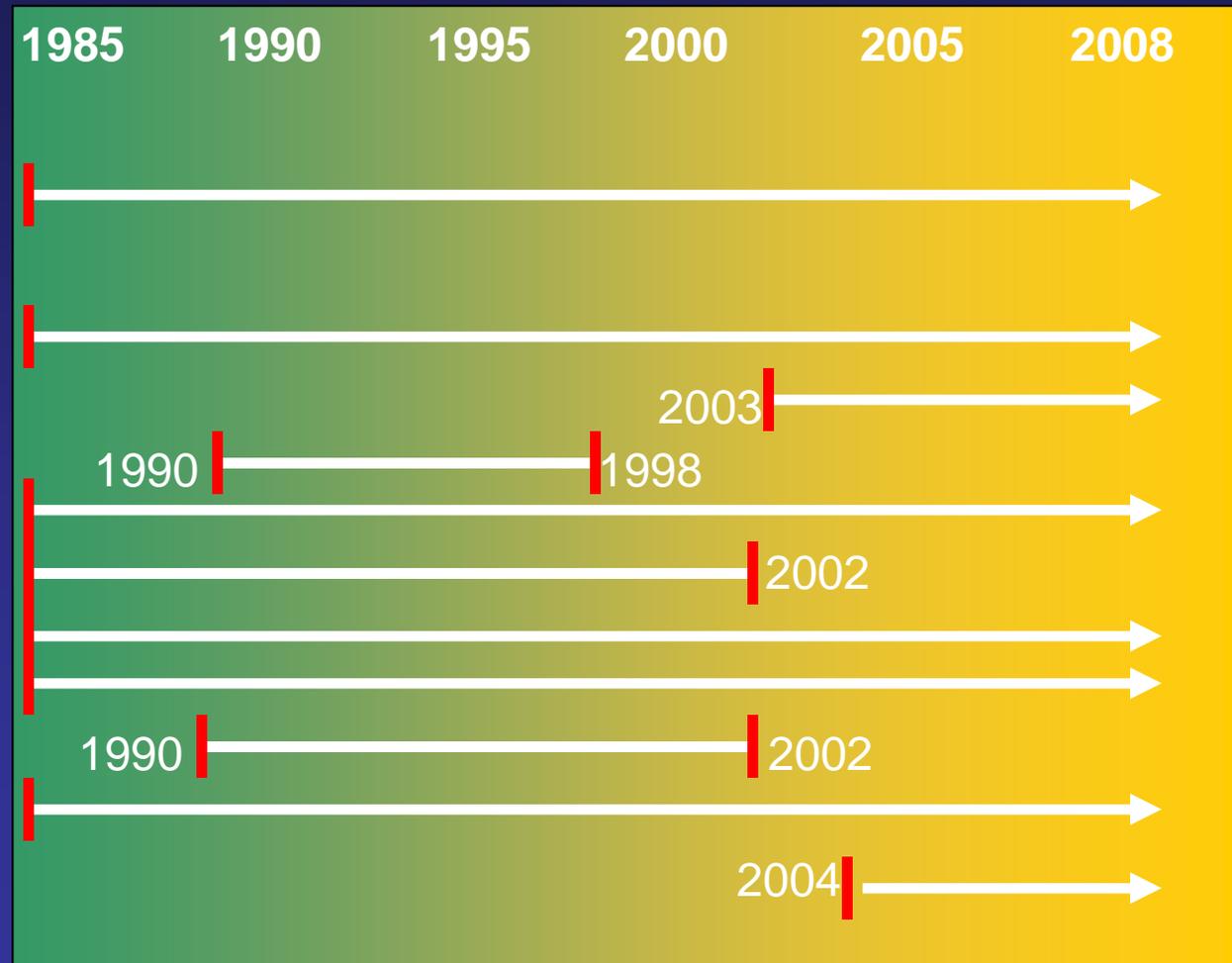


Phytoplankton, Benthos Monitoring

Chesapeake Bay Program Monitoring Networks History

Program Elements

1. Mainstem and Tidal Tributary Water Quality Monitoring
2. SAV
3. Shallow Water
4. Toxics Assessment
5. Phytoplankton
6. Zooplankton
7. Benthic
8. Ecosystem Process
9. Nutrient limitation
10. River Input
11. Nontidal Network



Review of Federal (USEPA) and State-Matching Grants: CBP Monitoring Program Support

CBP-STAC Monitoring Workshop III
December 8, 2008

• Tidal Mainstem and Tributary Monitoring	\$1.3M
• Submerged Aquatic Vegetation	\$0.6M
• Shallow Water Monitoring	\$0.6M
• Phytoplankton Monitoring	\$0.4M
• Benthic Invertebrate Community Monitoring	\$0.4M
• Ecosystem Processes	\$0.1M
• Nontidal Water Quality Monitoring I: Network	\$0.3M
• <u>Nontidal Water Quality Monitoring II: River Input</u>	<u>\$0.6M</u>
– Total	\$4.3M

The Chesapeake Bay
Long-term Water Quality
Monitoring Program Review
and Optimization Process

Initiating the Program Optimization Process: Proposal to the Chesapeake Bay Program Scientific and Technical Advisory Committee for a Monitoring Program Review

1. Provide an assessment of how well the current package of Bay Program funded monitoring programs support Bay Program objectives.

And decision-making in the Bay watershed

2. Provide recommendations that will enable more efficient use of scarce resources and improved ecological assessments in support of Bay Program objectives.
3. Explain implications, pro and con, of recommended changes.
4. Prioritize recommended changes.

Phase I: The Process via 3 Workshops



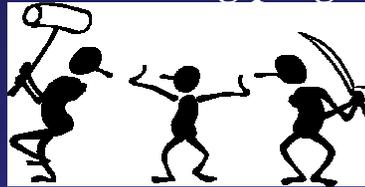
Identify existing goals



Identify existing monitoring programs



Compare goals and monitoring programs to identify gaps.



Recruit a professional facilitator

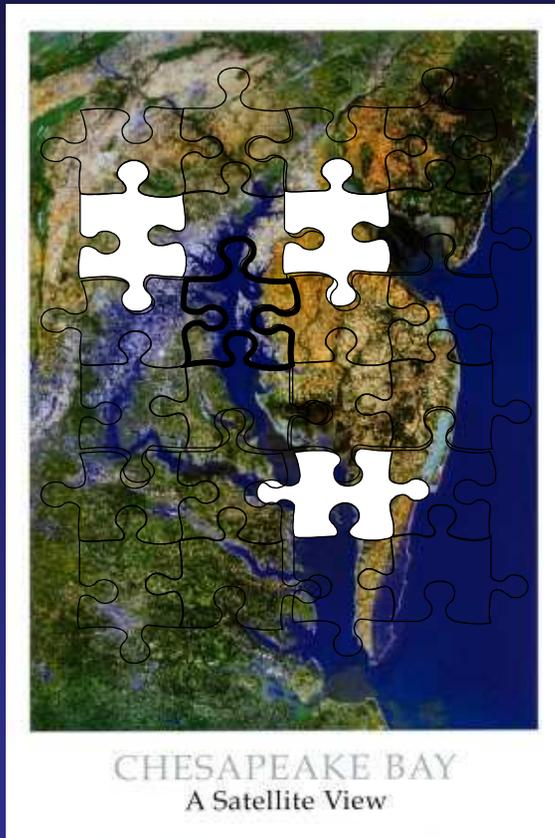


Workshop 1. Identify & convene senior level management personnel to prioritize goals.



Workshop 2. Identify & convene monitoring program representatives and identify attributes of existing programs.

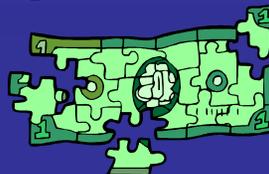
Phase I: The Process (Continued)



Compare senior management priorities with existing monitoring programs to identify gaps, overlaps, and efficiencies.



Workshop 3. Reconvene senior level managers to reaffirm priorities and realign monitoring programs to match priorities.



What does the Emerald City of Monitoring look like?



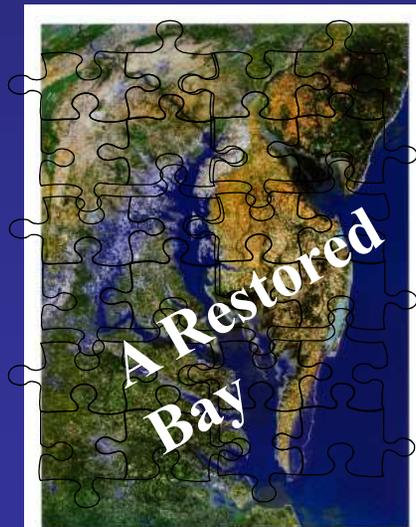
Workshop participants wallpapered the room with ideas about what should be monitored...



Our Emerald City of Monitoring



What we can afford



CHESAPEAKE BAY
A Satellite View

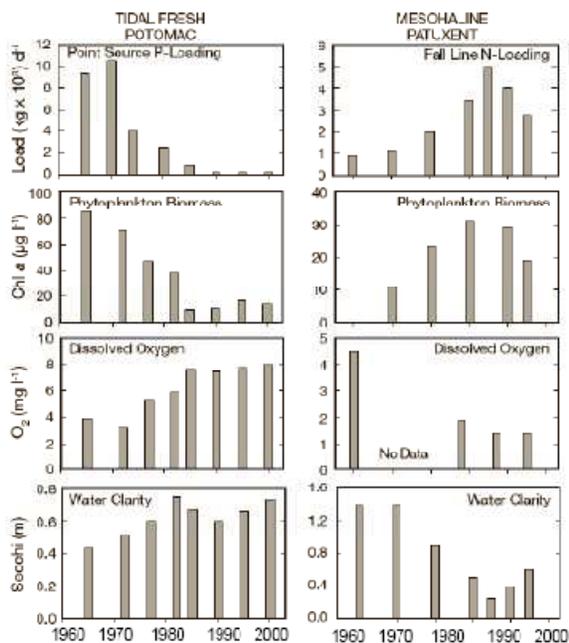
Information needs requested by the Senior Managers



Assess Management Effectiveness
in the Watershed

Monitor to Support 303d Listing/Delisting
Decisions
(Ambient Water Quality Criteria:
Dissolved oxygen, Water Clarity
and CHLA)

Support communications
(e.g. Chesapeake Bay Barometer)

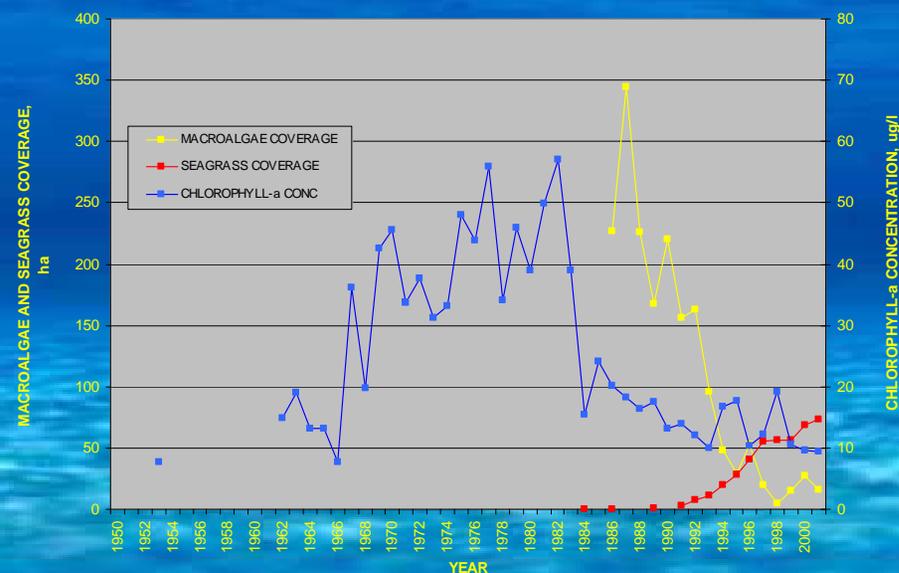


Reductions in nutrient loading

- In Potomac, P reductions led to reduce phytoplankton biomass and higher DO and water clarity
- In Patuxent, similar pattern with N reductions in the 1980s

Kemp et al. 2005

MACROALGAE AND SEAGRASS COVERAGE, AND CHLOROPHYLL-a CONCENTRATIONS IN HILLSBOROUGH BAY



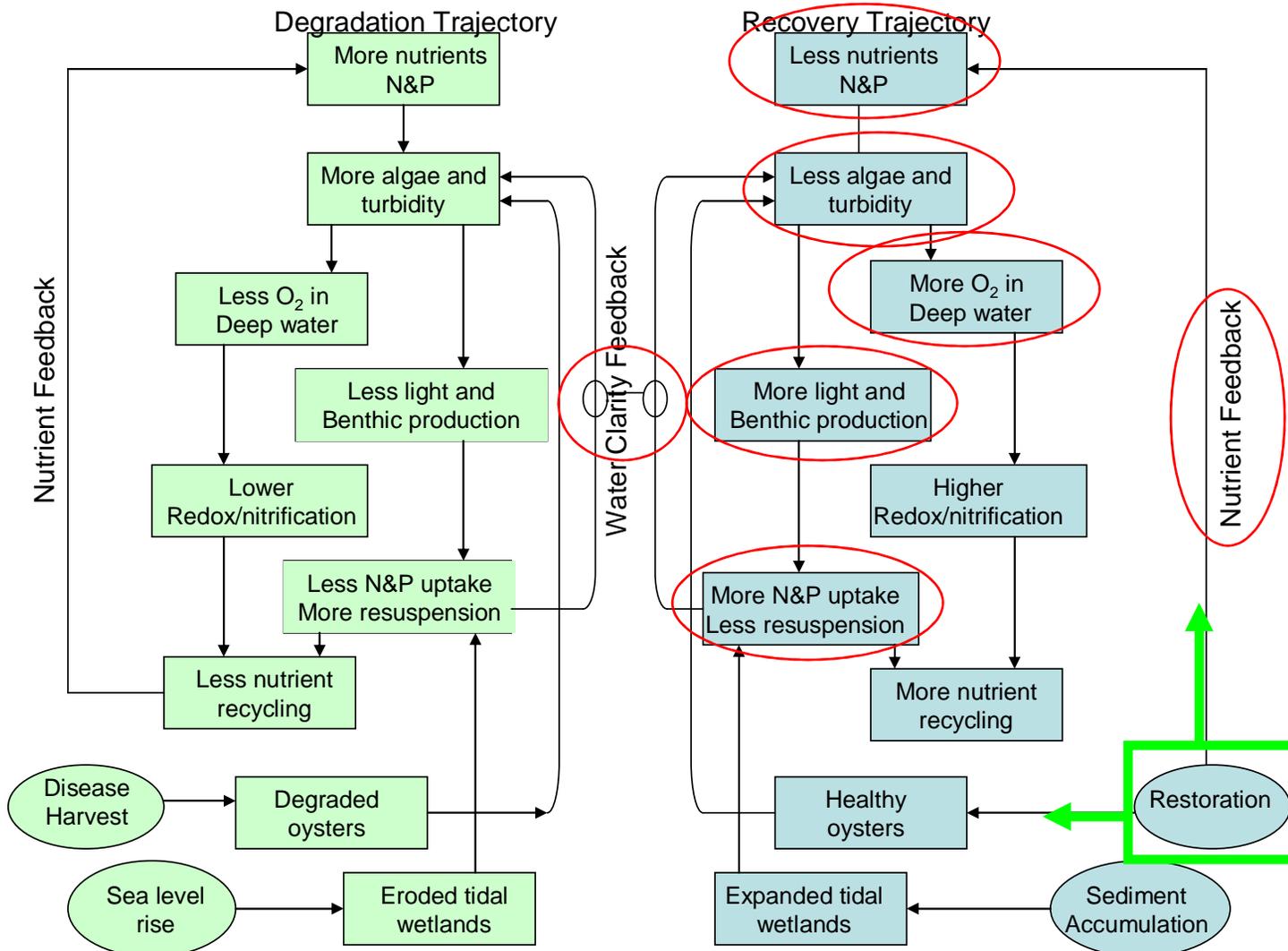
Johansson, 2002

Matching Management Goals with Monitoring Program Elements Based on Expected Restoration Tracking Signals

System Responses

Assessing effectiveness of nutrient controls:

Decrease nutrient load \longrightarrow Improve Water Quality (D.O., Water Clarity CHLA, SAV, Aq Life)

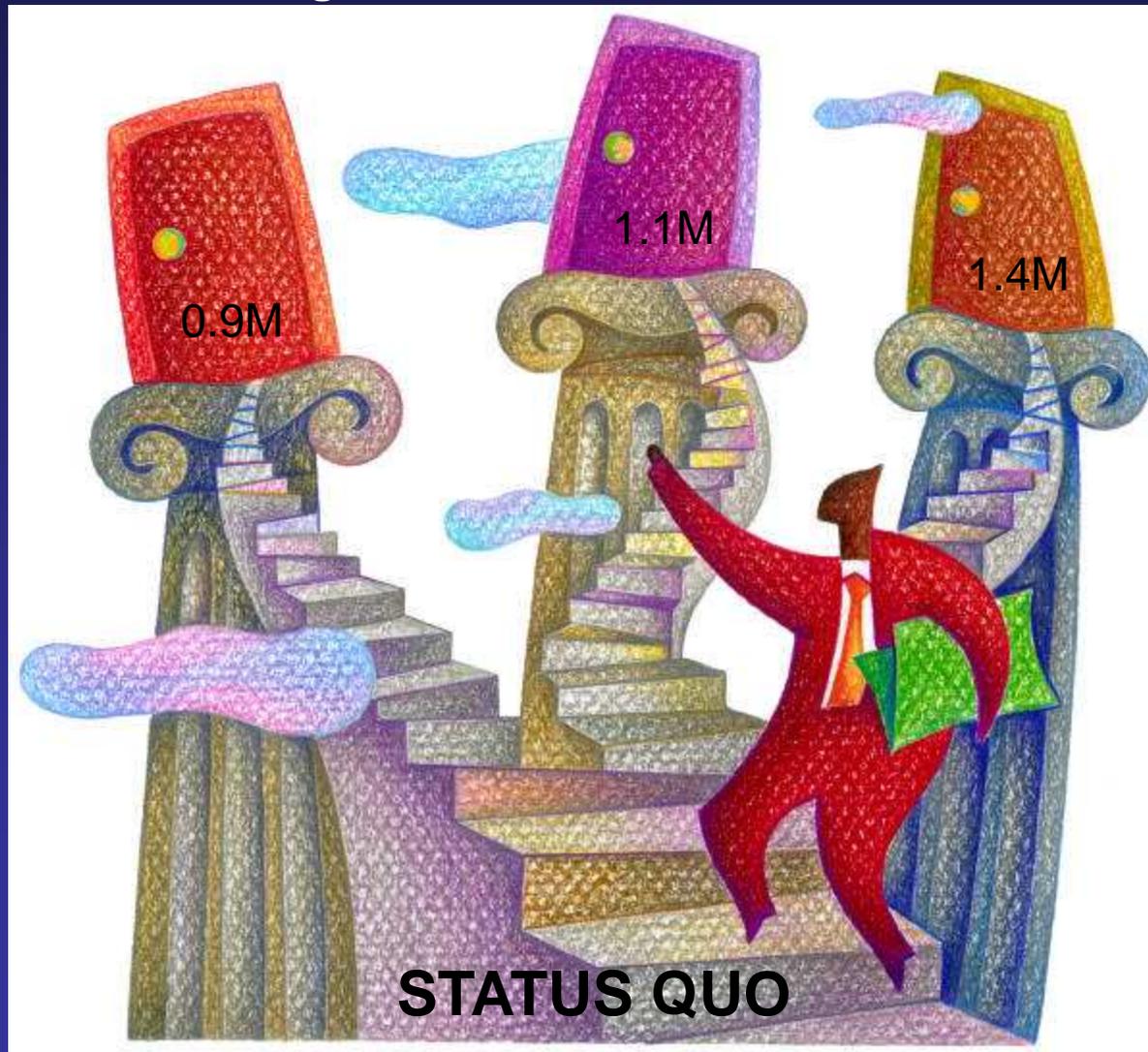


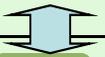
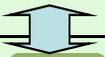
Conceptual model of Chesapeake Bay degradation and recovery. Page 21 in Kemp et al. 2005. Eutrophication of Chesapeake Bay: Historical trends and ecological interactions. Mar. Ecol. Prog. Ser. 303:1-29.

Conceptual Model of the Chesapeake Bay Ecosystem and Response Trajectories

3 Realignment Options were developed to address Management Priorities

**Option 1
Modest change** **Option 2
Significant
Change** **Option 3
Major changes**



Monitoring Programming Decision Matrix		Option 1	Option 2	Option 3	Status Quo	
TIDAL	Listing/Delisting  CWA 303d					
	Seasons:	Cruises	Summer	Apr-Oct	Apr-Oct	Mar-Nov
		Benthic & SAV	As needed	As needed	As needed	As needed
	Cruises	4 MD, VA	7 MD, VA	7 MD, VA	16 MD, 14 VA	
	Shallow water diagnostics					
	Other diagnostics (Nutrients, Phytoplankton, Ecosystem Processes, other)		 Nutrients			
WATERSHED	Nutrient/sediment load analyses for expanded data					
	Load Indicator Development					
	Additional Support for Priority Watershed Monitoring (e.g. source sectors, small watersheds)					
						
	Existing Network Support					

Pathway for Chesapeake Bay Program Monitoring Realignment

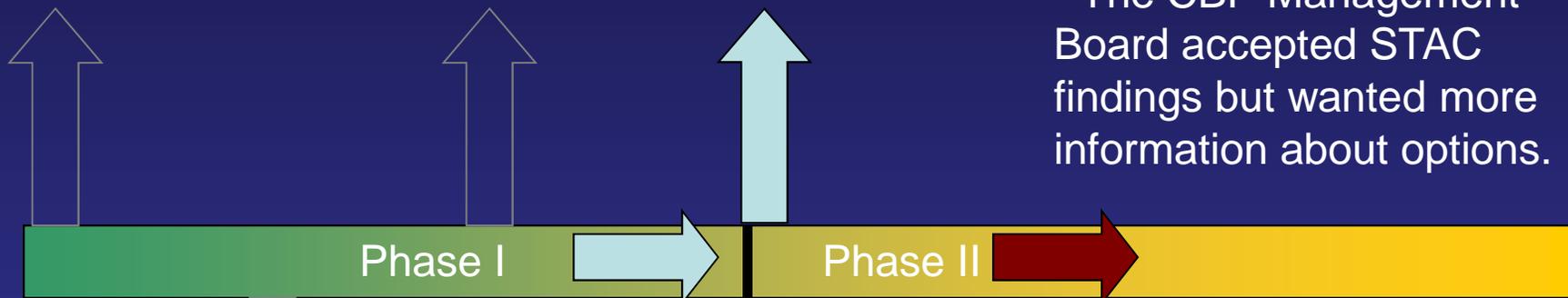
2007
Budget
Steering
Committee

2008-09
STAC
Workshops
I,II,III

2009
Monitoring
Realignment
Action Team

- CBP monitoring team developed and presented options for “rebalancing”.

- The CBP Management Board accepted STAC findings but wanted more information about options.



2007-08
MASC
Proposal
To STAC

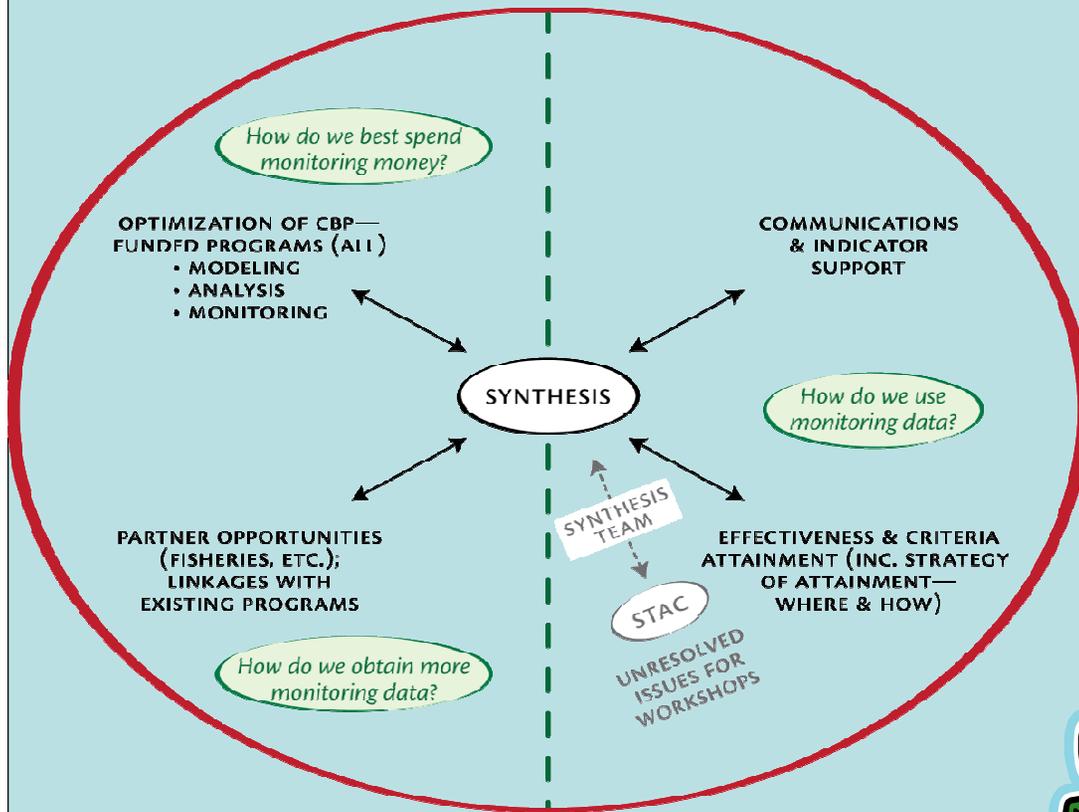
March 2009
Rebalancing Options
presentation
to the new
CBP Management
Board



*Phase II: CBP Baywide and Basinwide Partners
Monitoring Networks Realignment Options*

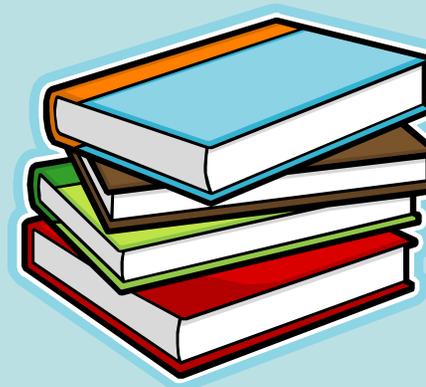


Monitoring Realignment and Synthesis: Phase II



Workshops and Meetings

Weekly Conference Calls



Focused Reports



Phase 2: Rebalancing Options Charts

- Program
- Realignment description
- Realignment value
- Current uses
- Consequences of Realignment from Tidal Monitoring
- Rationale for Realignment
- Investment to Watershed Monitoring
- **Remaining Unmet Needs to Tidal and Watershed Monitoring Programs (\$7-8M)*



2007-Nov 10, 2009

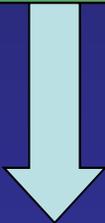
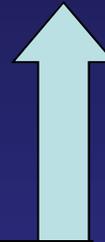
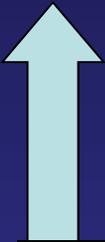
2007
Budget
Steering
Committee

2008-09
STAC
Workshops
I,II,III

2009
Monitoring
Realignment
Action Team



Revised
Options/
Management
Board decisions



2007-08
MASC
Proposal
To STAC

2009
March
Options
presentation

2009
State
Budget
issues



USEPA + State Match Monitoring Program Elements (Water Quality)	2009 State changes	2009 Realignment Mgt Board Decision 1
Mainstem/Tidal tribs	VA reduced Eliz River stations	MD adjusts from 16 cruises to 14 (- \$34K)
SAV	No change	
Shallow water	Reduced	MD adjusts (- \$100K)
Phytoplankton	MD program eliminated VA continues	
Benthic	MD cut spring sampling	
Ecosystem Processes	Reduced	
River Input	No change	
Watershed	117d in progress	+ \$134K to Watershed Monitoring Priorities

- \$472K

Phase 3: Program Implementation

Lessons Learned

Lessons Learned

- *News flash!* Senior Managers indicated the Bay and Basin monitoring program was not providing them with the information they needed.
 - Shorter, more frequent scientist-manager and multi-level manager interactions preferred over less frequent, longer meetings.

Communications Team findings:

- Public wants local information (Watershed emphasis).
- Scientists need to more clearly articulate their findings in communications.
 - Managing manager expectations is critical.

Lessons Learned

- Partnership Team findings.
 - Our existing Monitoring Program is built upon partnerships.
 - There are nearly 300 monitoring programs that were accounted for across the Bay and the watershed.
 - Partnerships do not come free.
 - Standards and protocols are needed for guiding development of new partnerships for a monitoring alliance.

Lessons Learned

- Optimization Team.
 - Programs that are unified in their approach across jurisdictional boundaries sustained the strongest support. (e.g. SAV, Tidal Benthic programs, tidal long term water quality network).
 - Phytoplankton program eliminated in MD but not all plankton related variables (e.g. chlorophyll *a* still monitored)
 - Previously zooplankton monitoring eliminated.
 - In this review, programs with proven support to regulatory needs had the strongest support.

Lessons Learned

- Monitoring Realignment
 - **Synthesis is critical!**
 - We are in some respects data rich and information poor.
 - Synthesis is not free.
 - **We framed a vision for the growth of the monitoring program.**
 - This includes synthesis support, communications development and expanding partnerships.
 - **Gaps remain and are understood.**
 - We established a prioritized ranking table for future funding needs.
 - More integrated ranking beyond the next \$1M remains the work of the partnership to support priorities.

Lessons Learned

- Monitoring Realignment
 - Plan for a tremendous time investment by the community involved.
 - This was just one piece of the monitoring engine in the Chesapeake Bay and the Watershed.
 - Optimization exercises could benefit interactions among other monitoring elements.

Thank you

CBPO Staff (especially Jeni, Katie, Jackie, MEL, Jake, Mike)
Chesapeake Bay Management Community
Chesapeake Bay Monitoring Community
Chesapeake Bay Academic Community
MRAT Co-chairs Carlton Haywood and Denice Wardrop
MRAT Synthesis Team
CBPO Management Board

