

Innovative Monitoring Design Workshop

December 8, 2014.

CBP STAC/STAR Collaboration

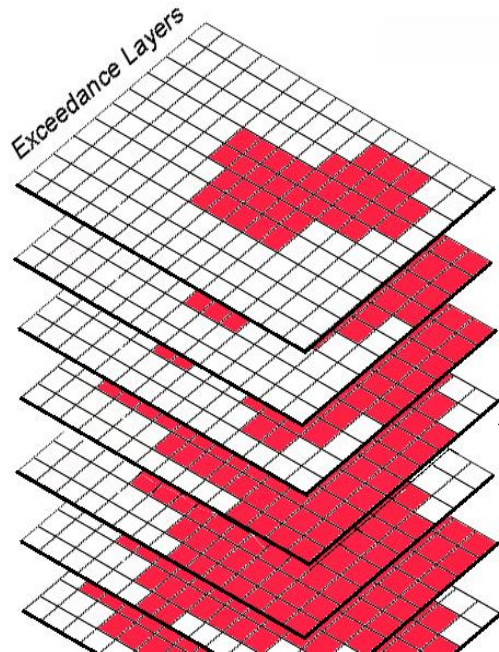
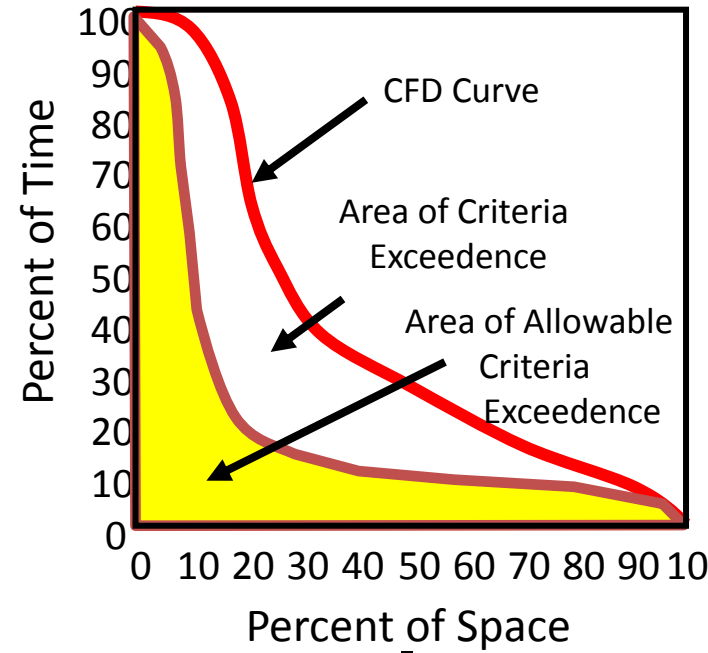
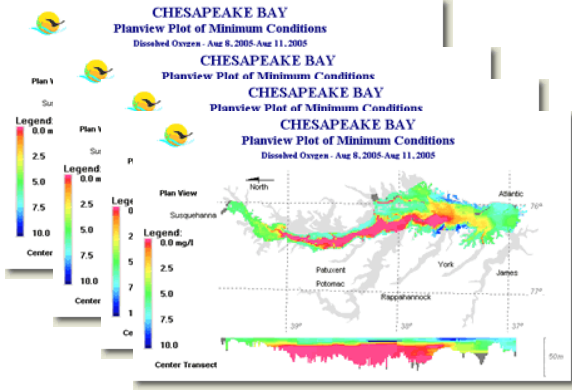
STAC sponsored workshop

Today's workshop supports the *Building and Sustaining Integrated Networks* process supporting the 2014 Bay Agreement

Today's focus:

- **PHASE II: Approaches to Sustaining the Water Quality Networks (Report: due February 2015)**
 - **CHALLENGE 1: Reducing Uncertainty in Measuring Attainment of Water Quality Standards in the Tidal Bay**
 - Key questions being considered:
 - Applications of existing or new technologies
 - Monitoring network designs
 - Opportunities for improved monitoring efficiencies and cost savings.

Batiuk: Criteria Assessment

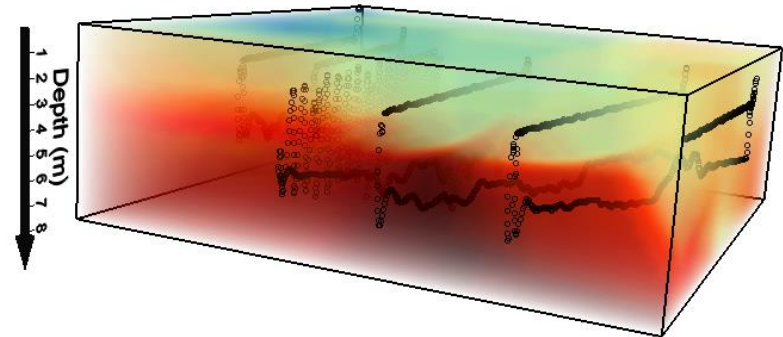
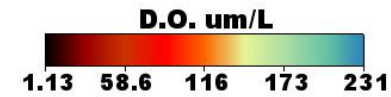
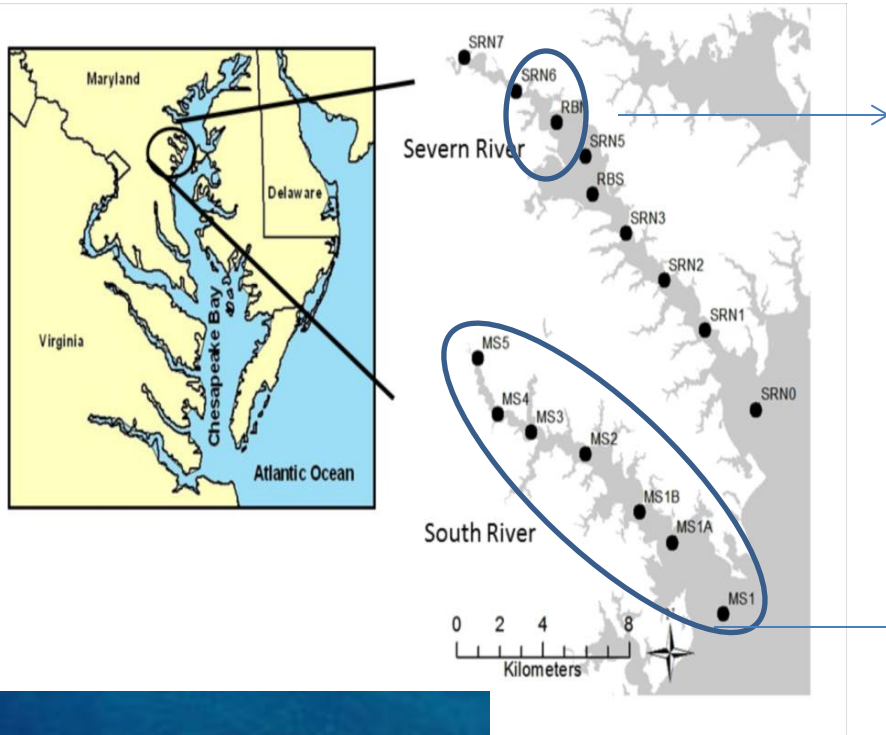


Date: 3/1/06

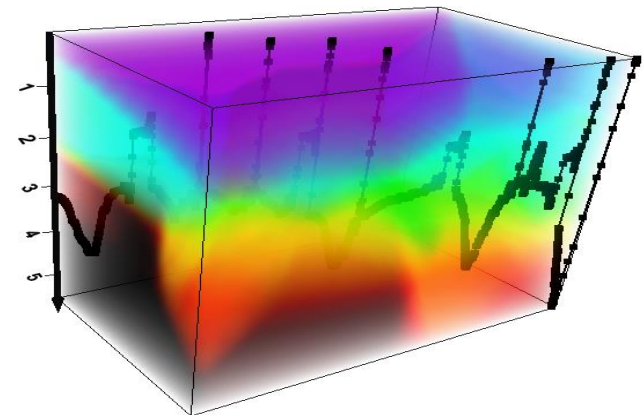
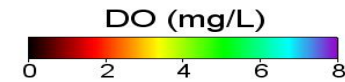
				Water Quality Criteria							Disposition by Segment/EU Pair	Listing Category	
				Dissolved Oxygen				Water Clarity					
				DO	TD	IM	Special Sturgeon	SAV Acres	WC Acres	SAV + WC*2.5			
CBTF	Maryland	MSN	Summer	5		5						Insufficient Data	3
		SWSAV	Summer	4		3.2	4.3					Insufficient Data - Previously Listed	3
		OW	Summer	4		3.2	4.3					Insufficient Data - Previously Listed	3
CECOH	Maryland	MSN	Summer	5		5						Insufficient Data	3
		SWSAV	Summer	4		3.2	4.3					Insufficient Data - Previously Listed	3
		OW	Summer	4		3.2	4.3					Insufficient Data - Previously Listed	3
CEBMR	Maryland	MSN	Summer	5		5						Insufficient Data	3
		SWSAV	Summer	4		3.2	4.3					Insufficient Data - Previously Listed	3
		OW	Summer	4		3.2	4.3					Insufficient Data - Previously Listed	3
CEBMR	Maryland	MSN	Summer	5		5						Insufficient Data	3
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		OW	Summer	4		3.2	4.3					Insufficient Data - Previously Listed	3
CEBMR	Maryland	MSN	Summer	5		5						Insufficient Data	3
		SWSAV	Summer	4		3.2	4.3					Insufficient Data - Previously Listed	3
		OW	Summer	4		3.2	4.3					Insufficient Data - Previously Listed	3
CEBMR - ALL	MD & VA	MSN	Summer	5		5						Insufficient Data	3
		SWSAV	Summer	4		3.2	4.3					Insufficient Data - Previously Listed	3
		OW	Summer	4		3.2	4.3					Insufficient Data - Previously Listed	3
CEBMR - MD	Maryland	MSN	Summer	5		5						Insufficient Data	3
		SWSAV	Summer	4		3.2	4.3					Insufficient Data - Previously Listed	3
		OW	Summer	4		3.2	4.3					Insufficient Data - Previously Listed	3
CEBMR - VA	Virginia	MSN	Summer	5		5						Insufficient Data	3
		SWSAV	Summer	4		3.2	4.3					Insufficient Data - Previously Listed	3
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CEBPH	Virginia	MSN	Summer	5		5						Insufficient Data	3
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		OW	Summer	4		3.2	4.3					Insufficient Data - Previously Listed	3

Muller: Applications of AUVs in Chesapeake Bay for documenting water quality

AUV Missions: Local hypoxia, local interests



Round Bay, Severn River hypoxia (Aug 13, 2010)



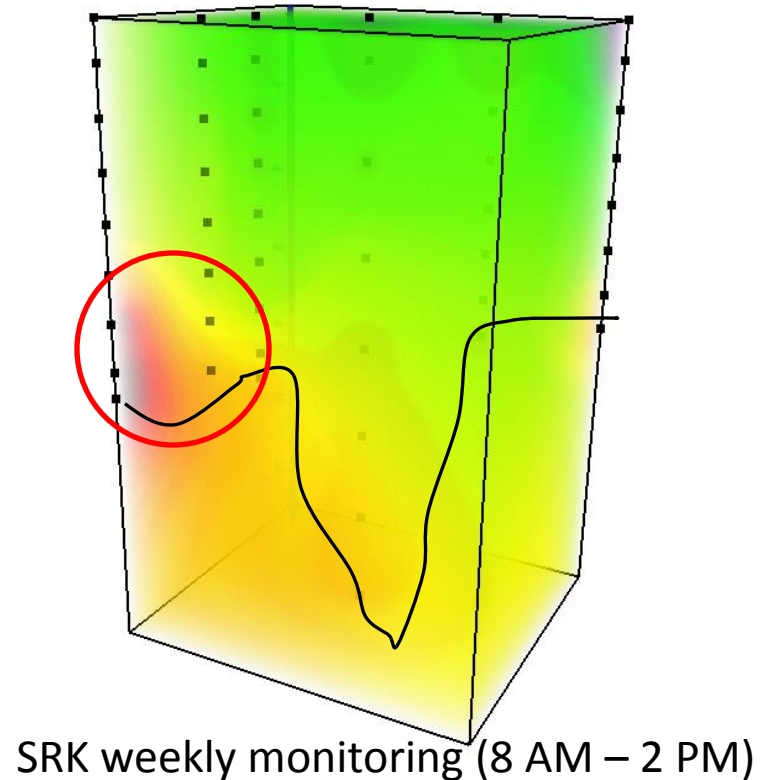
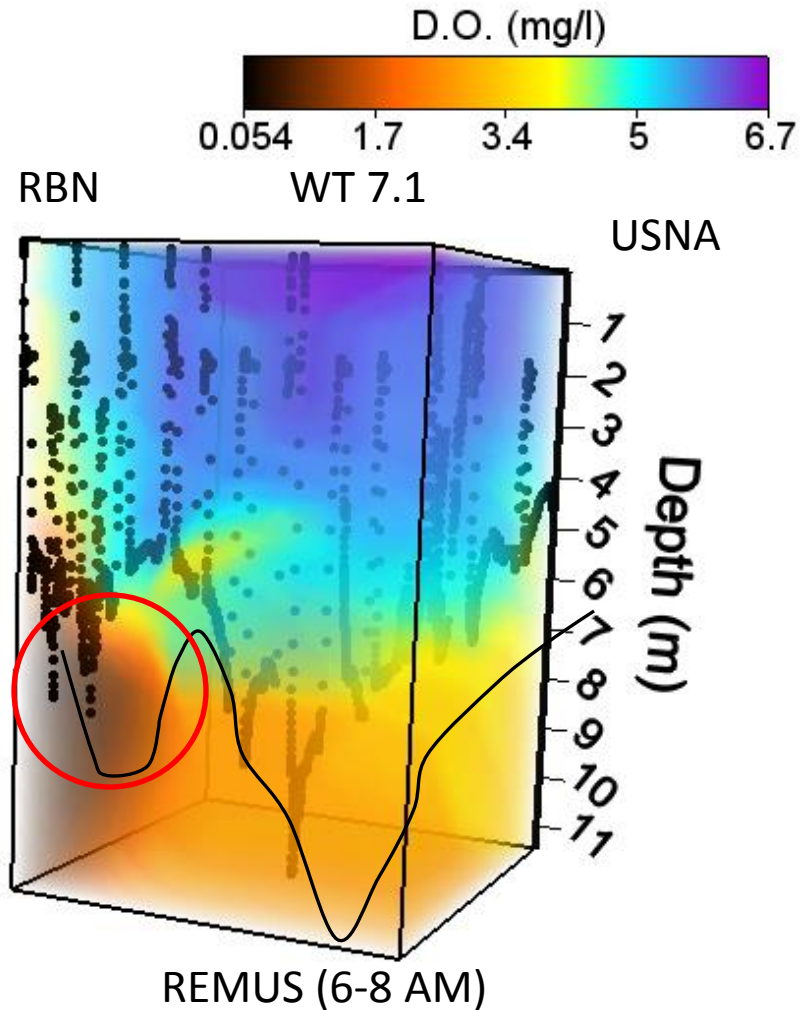
South River hypoxia (July 22, 2011)



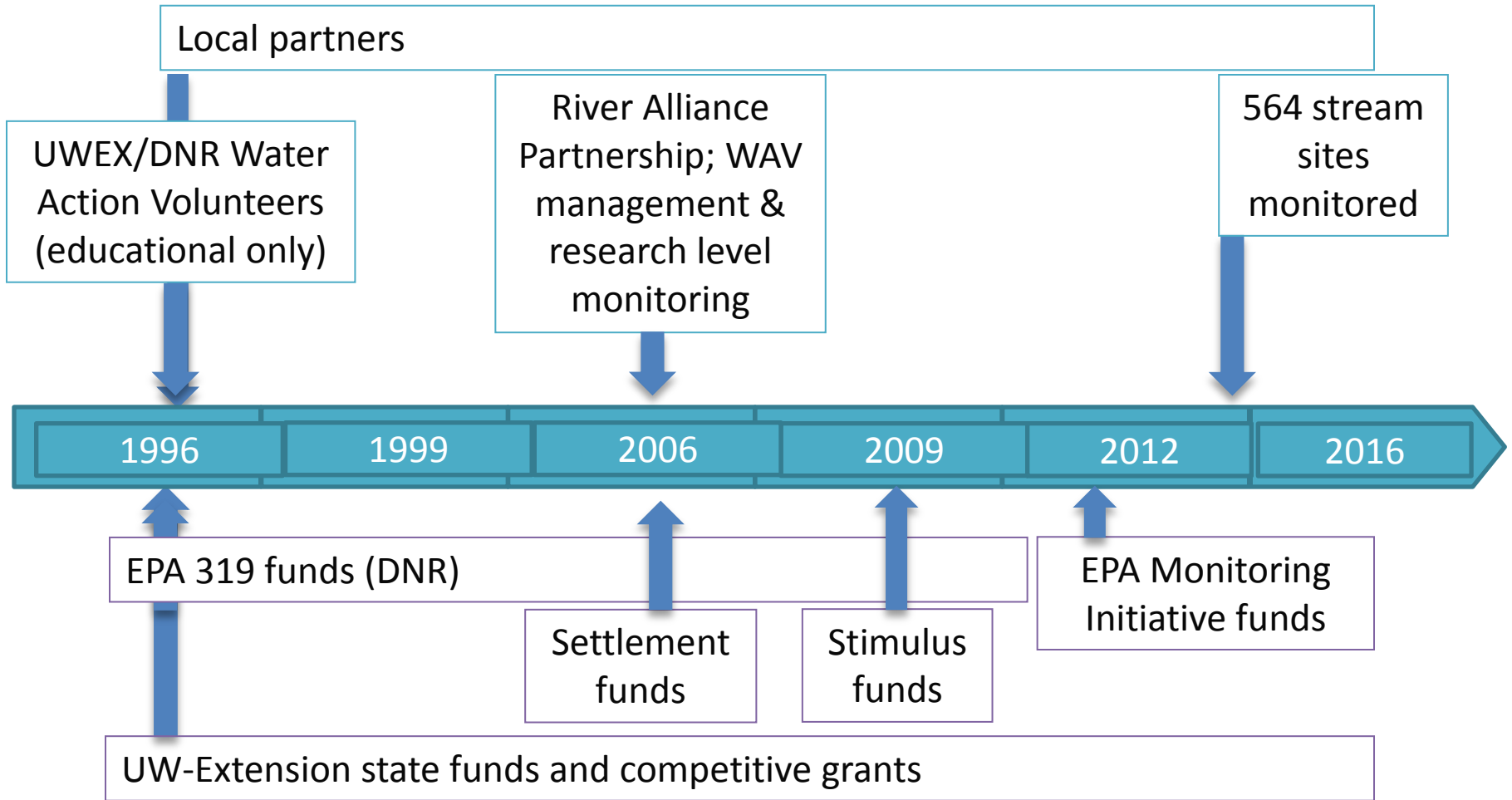
Muller and Muller: AUV vs. Citizen Science

Severn River

June 15, 2011- Round Bay to College Creek

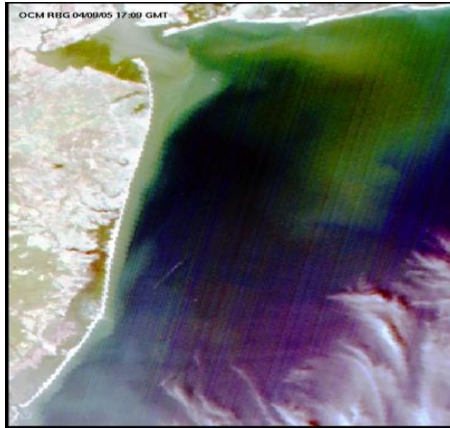


A BRIEF HISTORY – STREAMS PROGRAM

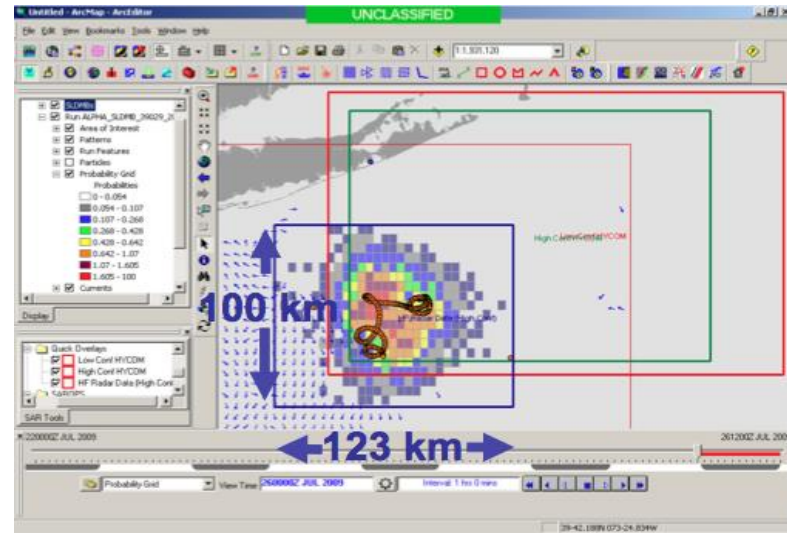


KUSKA: MARACOOS THEMES IN THE CHESAPEAKE

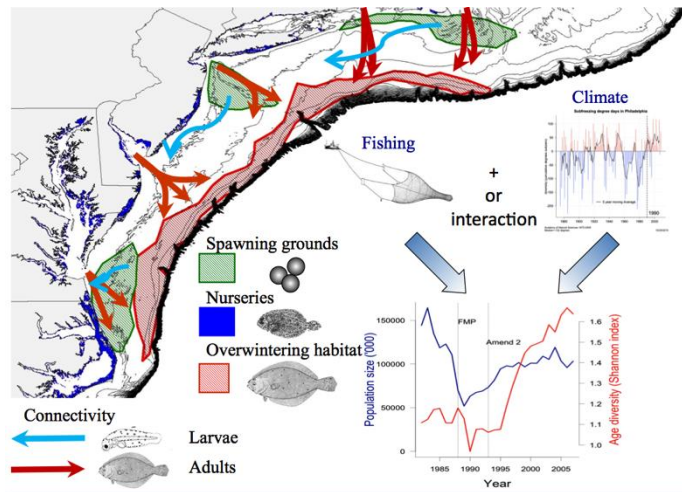
Water Quality



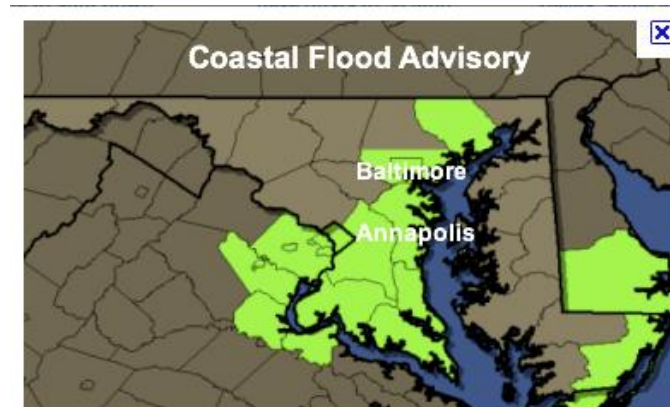
Maritime Safety and Resiliency



Ecological Decision Support



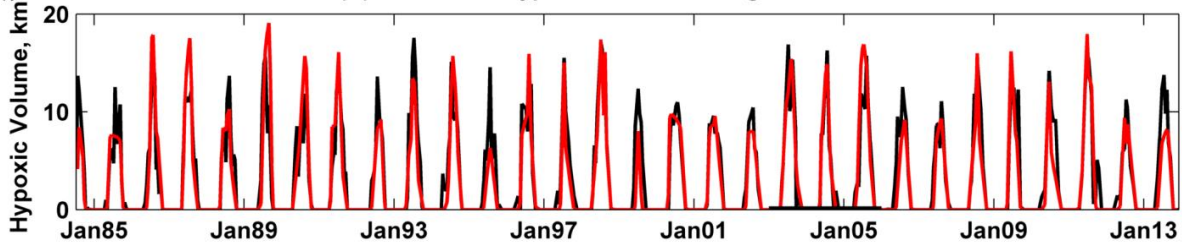
Coastal Inundation



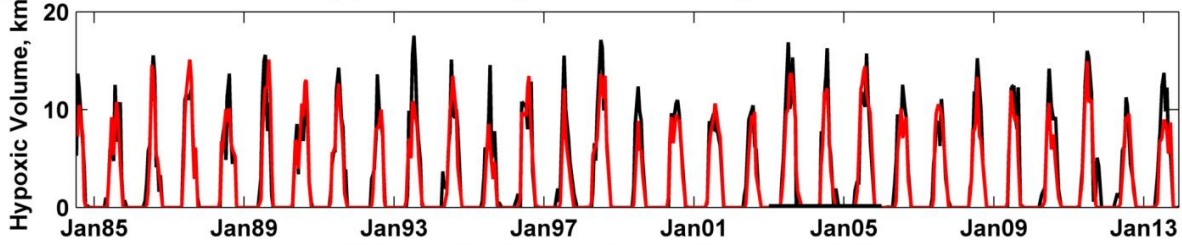
➤ Results (1): Monitoring Cruise Data (every 2 to 4 weeks for 28 years)

Compare “Interpolated HV” (13 sites) to “Geometric HV” with 2 to 3 sites:

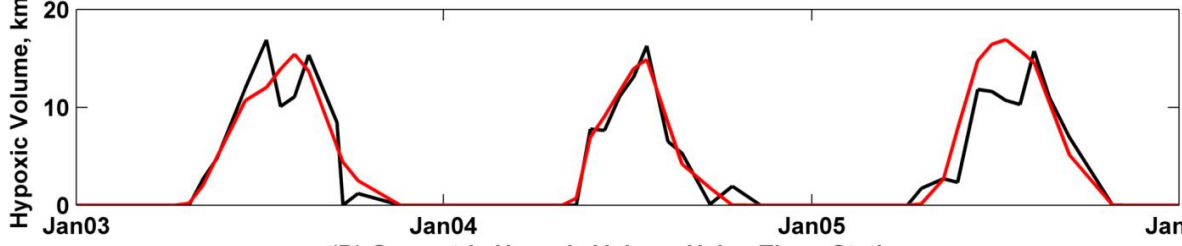
(A) Geometric Hypoxic Volume Using Two Stations



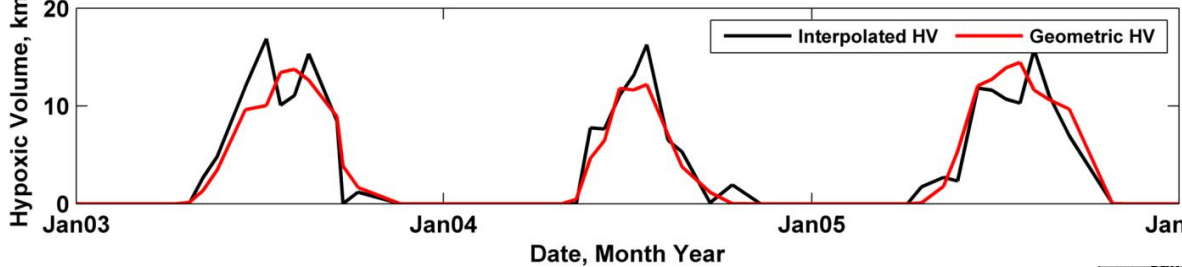
(B) Geometric Hypoxic Volume Using Three Stations



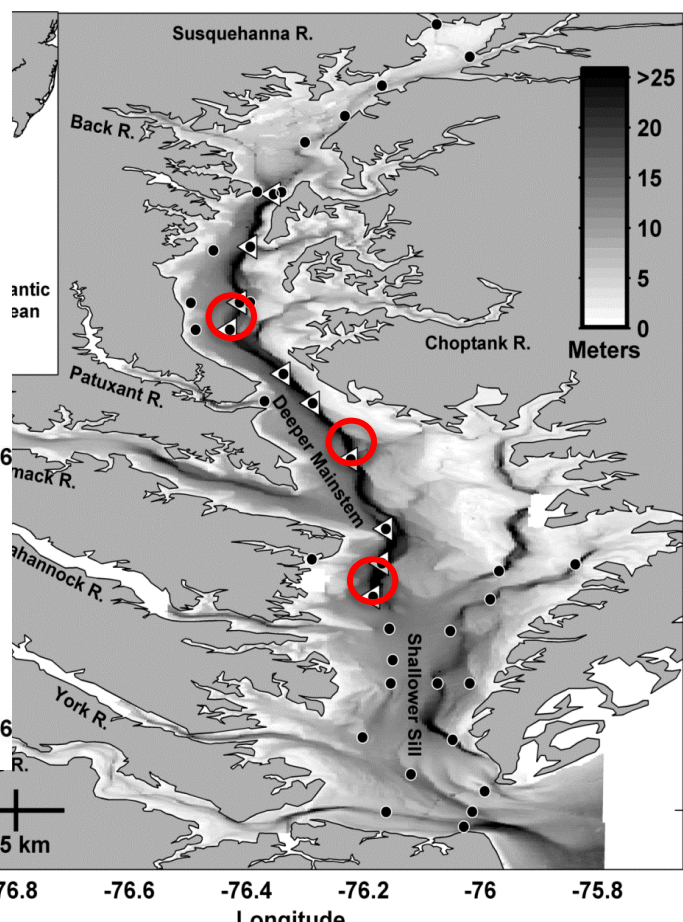
(C) Geometric Hypoxic Volume Using Two Stations



(D) Geometric Hypoxic Volume Using Three Stations

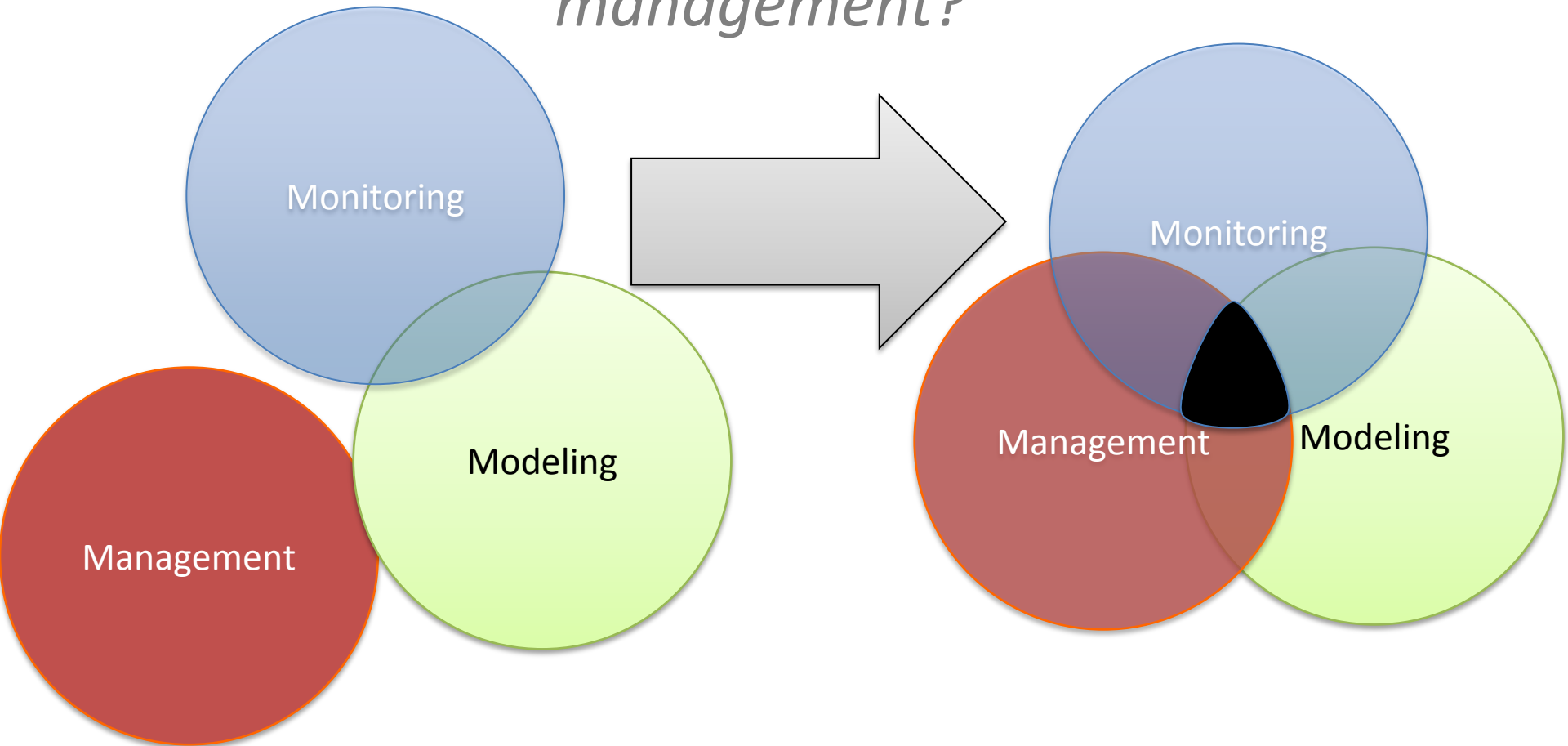


Bever, Friedrichs 2x: Assessment Options Support: Lessons From Model Assessments of Bay Monitoring Data



Bringing new hypotheses and models into CBP monitoring

*how do we better tie monitoring, modeling and
management?*



Pete Kleinman and Kathy Bailey-Boomer

Targeted Monitoring Opportunity: Bay Water Quality Management Considerations to Advancing Chesapeake Bay Monitoring Strategies

Monitoring Needs from a Manager's Perspective:

- Watershed Inputs
 - Practice outcomes
 - Tributary response
- Estuarine circulation
 - Mainstem vs Trib influence
- Estuarine restoration effects (underwater wetland bmp's?)
 - Oyster reefs
 - SAV restoration

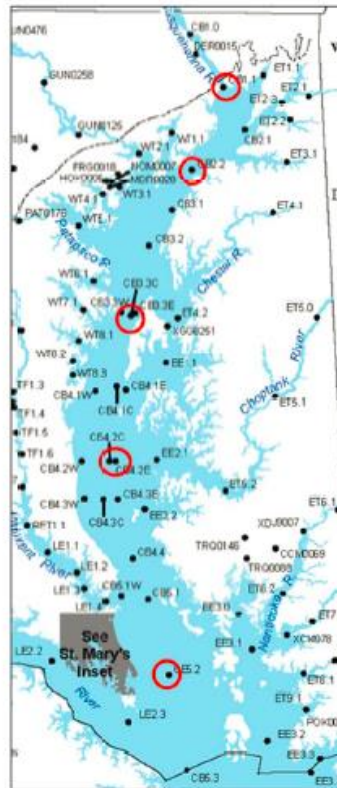


Figure S-1. Stations (circled in red) selected for time series plots.

CBP Model Results:

Application of the CBEMP to Examine the Impacts of
Sediment Scour in Conowingo Reservoir on Water
Quality in the Chesapeake Bay

A Report to the US Army Engineers Baltimore District
October 2013 Draft Report

Carl F. Cerco, Mark R. Noel

US Army Engineer Research and Development Center, Vicksburg MS



June Storm

Alternative
Models?
Wind, Shed
Landscape
Setting?