Chesapeake Bay Program
A Watershed Partnership

Designing Sustainable Coastal Habitats

Workshop Report for STAC
September 18, 2013

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Purpose

To explore approaches for designing coastal habitats that will be sustainable in the face of multiple stressors.

Organized around three themes:

1) Assess the current status and trending condition of coastal ecosystems in the Chesapeake Bay Watershed

2) Assess the capacity of coastal habitats to support flora and fauna

3) Identify those coastal habitats that will be sustainable under increasing human impacts and a changing climate

Steering Committee

- **Alicia Berlin**, U.S. Geological Survey, Patuxent Wildlife Research Center
- **Donna Bilkovic**, Virginia Institute of Marine Science
- **Pat Devers**, U.S. Fish and Wildlife Service
- **Matthew Ellis**, Chesapeake Research Consortium
- **Natalie Gardner**, Chesapeake Research Consortium
- **Jennifer Greiner**, U.S. Fish and Wildlife Service
- **Jeff Horan**, U.S. Fish and Wildlife Service
- **Lee Karrh**, Maryland Department of Natural Resources
- **Bernie Marczyk**, Ducks Unlimited
- **Mary Ann Ottinger**, University of Maryland
- **Walter Priest**, National Oceanic and Atmospheric Administration
- **Quentin Stubbs**, U.S. Geological Survey

Key Questions

1) Trending conditions
   - *What are the most important ecological components /functions of coastal habitats?*
2) Species as Surrogates in Design
   - *How can we use changes in individual species habitat to help us gauge the sustainability of coastal habitats in the face of climate change and human development?*
3) Sustainable in Changing Conditions
   - *What data, models and other decision support tools are particularly helpful in designing coastal habitats while managing for and adapting to a rapidly changing environment?*

Major Recommendations

1) Institute a more balanced approach to Chesapeake Bay restoration by integrating water quality and habitat goals;

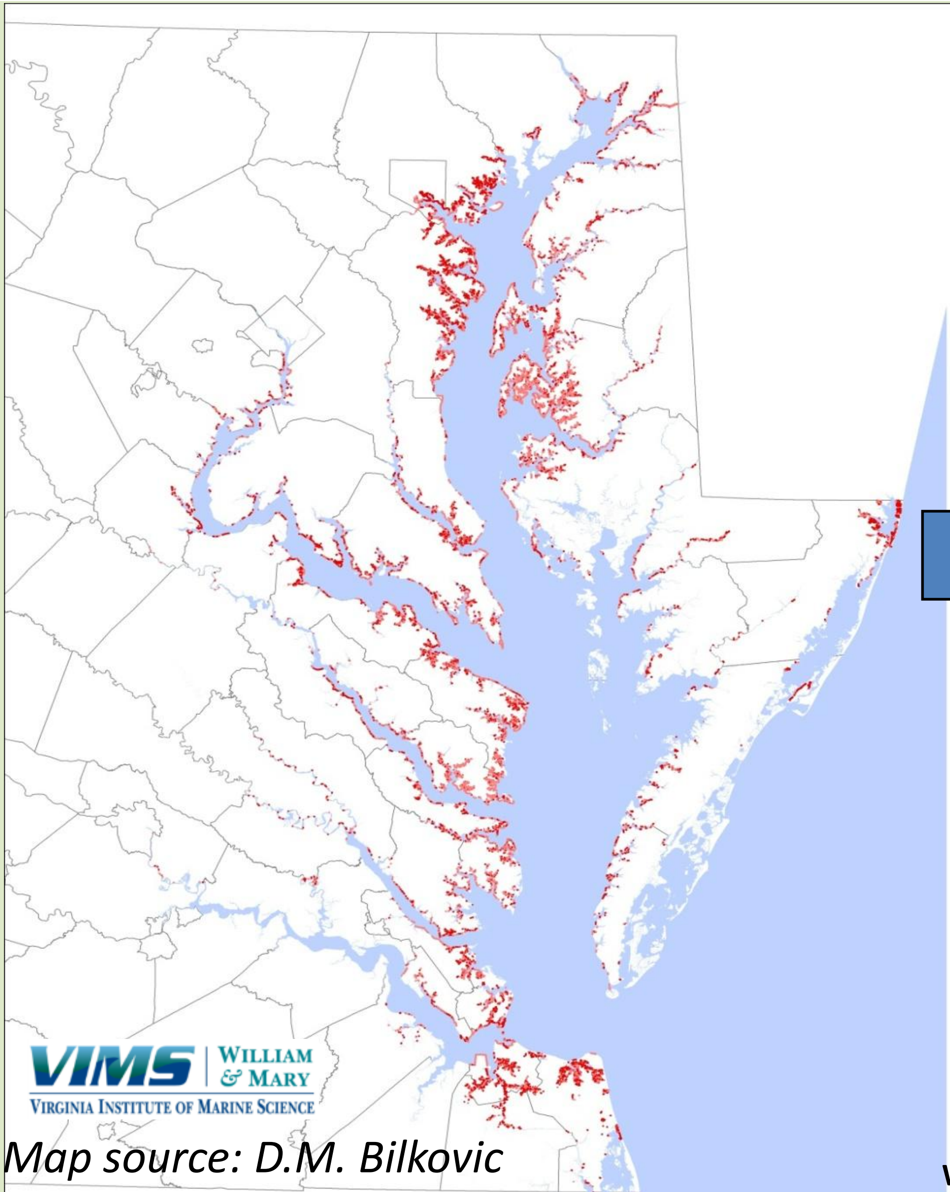
2) Expand the spatial and temporal scales used to set Bay restoration/conservation targets;

3) Initiate landscape scale pilot projects to apply science using Structured Decision Making (SDM);

4) Align differing and complex objectives for management of living resources using an adaptive management framework and decision matrix models, such as SDM

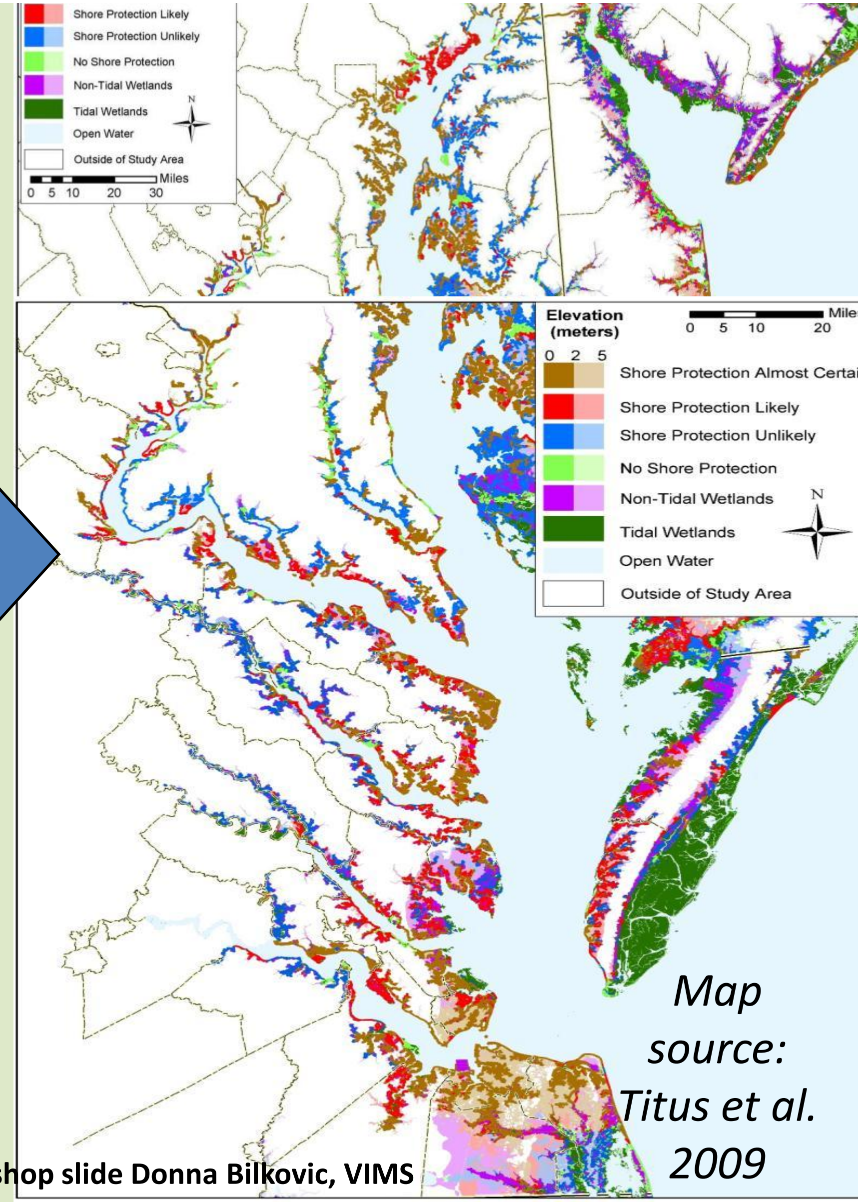
1) Institute a more balanced approach to Chesapeake Bay restoration by integrating water quality and habitat goals

Current shoreline hardening – Bulkhead/Riprap



Map source: D.M. Bilkovic

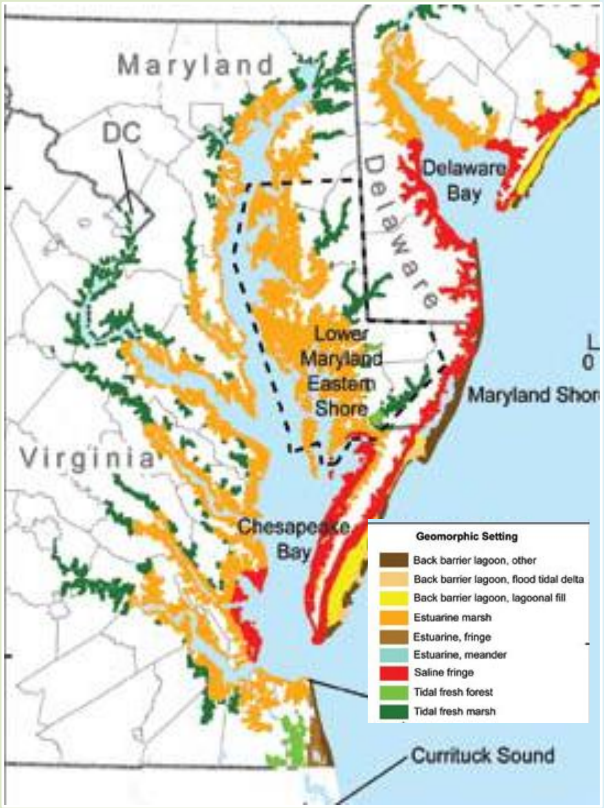
Future shore protection



Map source: Titus et al. 2009

Workshop slide Donna Bilkovic, VIMS

2) Expand the spatial and temporal scales used to set Bay restoration and conservation targets



Most vulnerable coastal wetlands

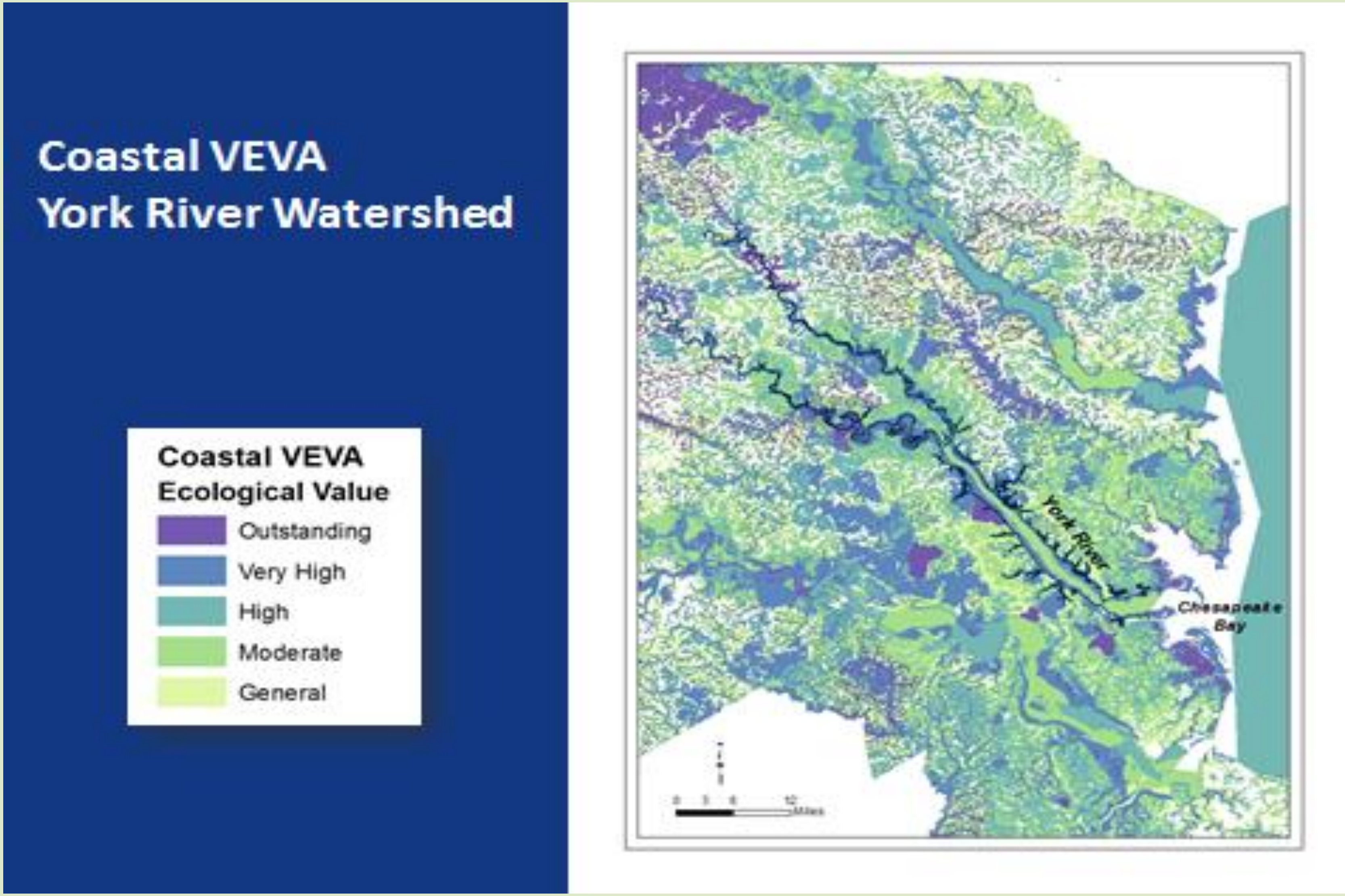
- Estuarine marshes already experiencing submergence & those exposed to development pressures & high RSLR
- Tidal freshwater marshes –physically limited resource in the coastal landscape with high ecological value for fisheries; vulnerable to species shifts with salinity intrusion (*Perry et al. 2009*)
- Freshwater wetlands that depend primarily on precipitation for their water supply may be more vulnerable to climate change than those that depend on regional groundwater systems (*Winter 2000*)

Most resilient coastal wetlands

- Wetlands within an ecologically connected network of terrestrial, FW, coastal & marine areas
- Wetlands in landscape settings that allow retreat
- Wetlands that receive relatively high sediment loads &/or are experiencing relatively low rates of SLR/subsidence

Workshop slide Donna Bilkovic, VIMS

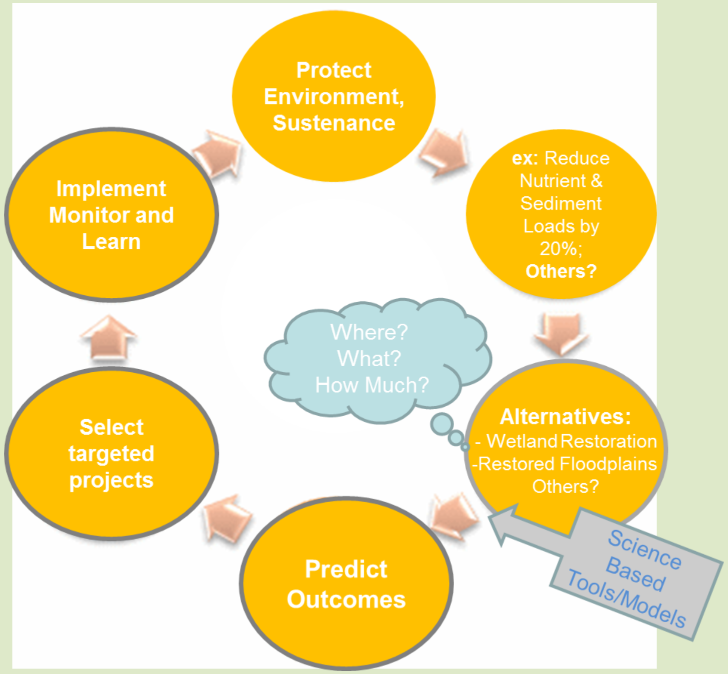
3) Initiate landscape scale pilot projects to apply science using Structured Decision Making



Workshop slide Marsha Berman, VIMS

4) Align differing and complex objectives for management of living resources using an adaptive management framework and decision matrix models, such as SDM

Workshop slide Kathy Boomer, TNC



Reach	Subbasin	Reach Length (ft)	Watershed Area (acres)	Retention Area (acres)	Restoration Type	Number of Owners	EOS TN (lbs/yr)	TN captured (lbs/yr)	EOS TP (lbs/yr)	TP captured (lbs/yr)	EOS TSS (lbs/yr)	TSS captured (lbs/yr)	Cost	C
6297	Nass	266	749.64	19.36	buffer	1	212,264	39,177	32,779	11,318	144,877	3,449	$104,544	
6588	Nass	1043	28.88	5.58	plug	1	78,430	61,379	12,501	11,975	6,187	717	$3,232	
6592	Nass	1260	292.3	6.31	buffer	1	193,895	30,415	30,546	9,111	47,800	662	$34,074	
7232	Nass	492	85.19	2.82	buffer	1	140,458	32,306	22,332	9,352	15,881	285	$15,228	
10123	Nass	1053	79.63	7.53	buffer	1	53,676	28,240	8,463	6,667	7,860	952	$40,662	
6621	Nass	541	16.91	2.69	plug	1	45,920	32,842	7,319	6,779	3,622	346	$2,076	
6685	Nass	669	213.19	3.91	buffer	1	187,775	25,308	29,688	7,706	27,376	398	$21,114	
6796	Nass	164	10.99	10.91	plug	2	29,836	29,825	4,756	4,756	2,354	1,402	$5,364	
6853	Nass	371	64.17	10.99	plug	1	35,353	26,218	5,550	5,216	10,176	1,180	$5,396	
7521	Nass	285	211.73	57.31	buffer	3	2,573	2,270	79	78	49,722	6,616	$309,474	


Questions?