Synthesis examples and principles

Bill Dennison

27 May 2021

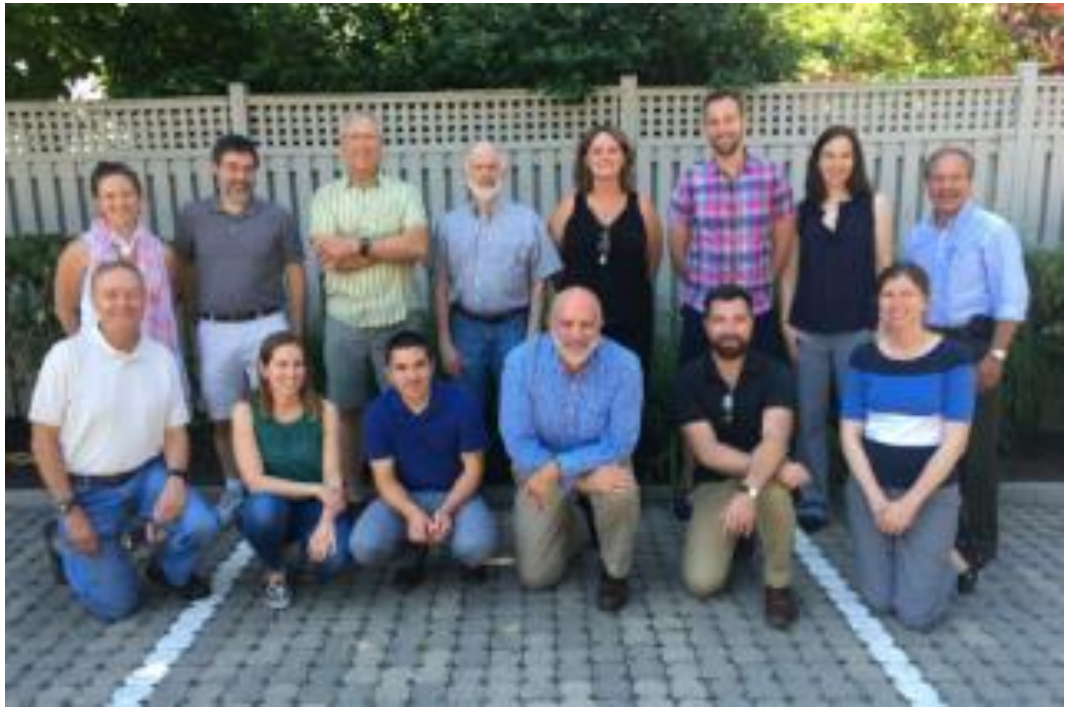
University of Maryland
CENTER FOR ENVIRONMENTAL SCIENCE
INTEGRATION AND APPLICATION NETWORK

New Insights report

New Insights report

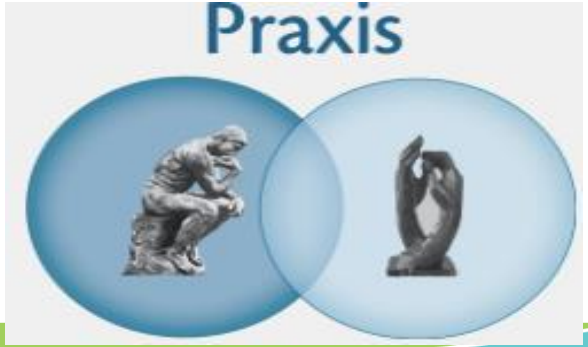
New Insights report featured in media and at Chesapeake Bay agreement meeting

Submerged Aquatic Vegetation Synthesis (SAV SYN)



Criteria for selecting participants

- Excellent scientists
- Focus on analysis and interpretation
- Commitment to Chesapeake Bay
- Willingness to work collaboratively towards a common cause



SAV workshop goals

Productive

Workshop summary produced, bookmarks event, document progress

Interactive

Activities & breakouts lead to input & exchange

Condensed

Workshops limited to necessary contact hours

Participatory

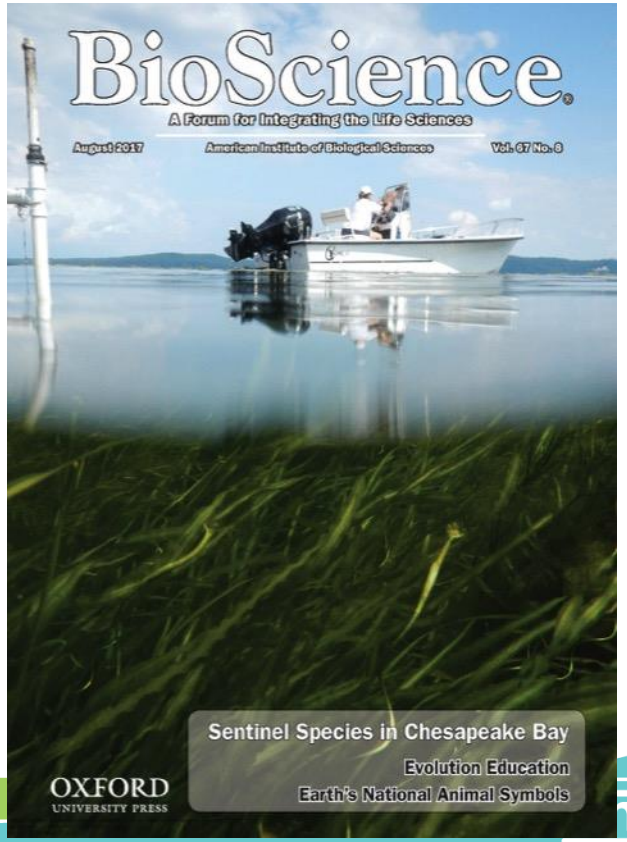
Multiple opportunities for input

Fun

Initial qualitative paper: Bioscience

Submersed Aquatic Vegetation in Chesapeake Bay: Sentinel Species in a Changing World

ROBERT J. ORTH, WILLIAM C. DENNISON, JONATHAN S. LEFCHECK, CASSIE GURBISZ, MICHAEL HANNAM, JENNIFER KEISMAN, J. BROOKE LANDRY, KENNETH A. MOORE, REBECCA R. MURPHY, CHRISTOPHER J. PATRICK, JEREMY TESTA, DONALD E. WELLER, AND DAVID J. WILCOX



Case study: Eelgrass decline due to climate change

Global Change Biology

Global Change Biology (2017) **23**, 3474–3483, doi: 10.1111/gcb.13623

Multiple stressors threaten the imperiled coastal foundation species eelgrass (*Zostera marina*) in Chesapeake Bay, USA

JONATHAN S. LEFCHECK[1], DAVID J. WILCOX[1], REBECCA R. MURPHY[2], SCOTT R. MARION[3] and ROBERT J. ORTH[1]

[1]*Virginia Institute of Marine Science, The College of William & Mary, Gloucester Point, VA 23062, USA,* [2]*University of Maryland Center for Environmental Science, Chesapeake Bay Program, Annapolis, MD 21403, USA,* [3]*Oregon Department of Fish & Wildlife, Marine Resources Program, Newport, OR 97365, USA*

Abstract

Proc. Natl. Acad. Sci.

Nutrient reductions lead to unprecedented recovery of a temperate coastal ecosystem

Jonathan S. Lefcheck[1,2*], Robert J. Orth[2], William C. Dennison[3], David J. Wilcox[2], Rebecca R. Murphy[4], Jennifer Keisman[5], Cassie Gurbisz[6,7], Michael Hannam[8,9], J. Brooke Landry[10], Kenneth A. Moore[2], Christopher J. Patrick[11], Jeremy Testa[12], Donald E. Weller[8], Richard A. Batuik[13]

Large media coverage

Energy and Environment

The Chesapeake's 'secret garden' is thriving again, but Trump could end that

By Darryl Fears March 5 Email the author

Eelgrass in the Chesapeake Bay in summer 2017. (Photo by Jon Lefcheck)

The Post's View • Opinion

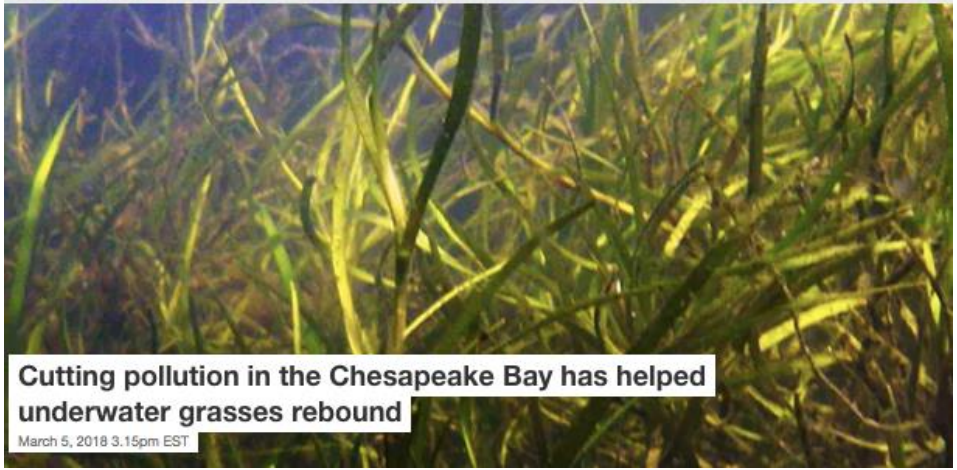
Why the Chesapeake Bay is the best in the world

THE CONVERSATION

Academic rigor, journalistic flair

Search analy

Arts + Culture Economy + Business Education Environment + Energy Ethics + Religion Health + Medicine Politics + Society Science + Technology



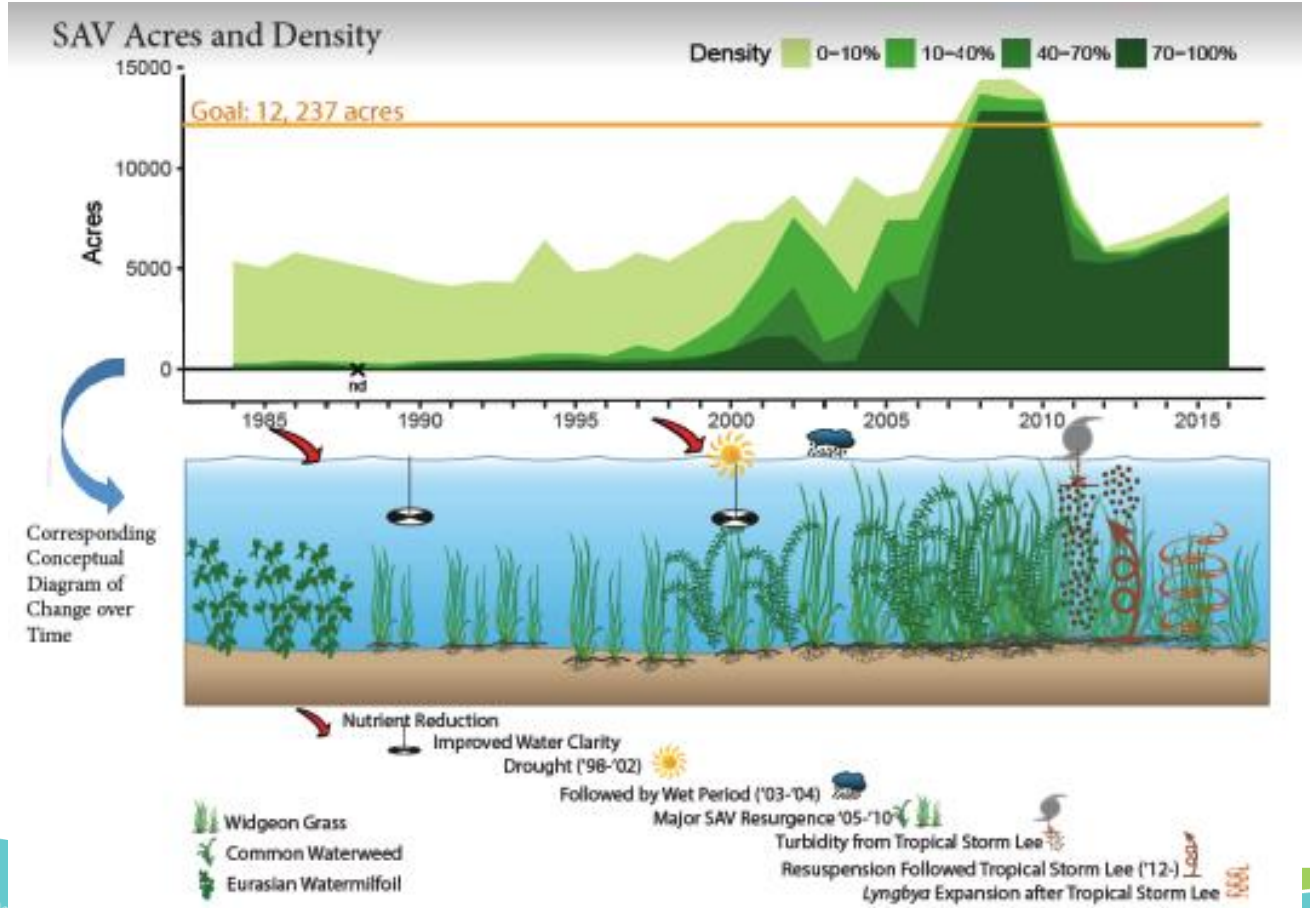
Cutting pollution in the Chesapeake Bay has helped underwater grasses rebound

March 5, 2018 3.15pm EST

Washington Post editorial supporting Chesapeake Bay Program

56 M people exposed to story via traditional and social media

Fact sheets produced for resource managers



Two key questions answered:

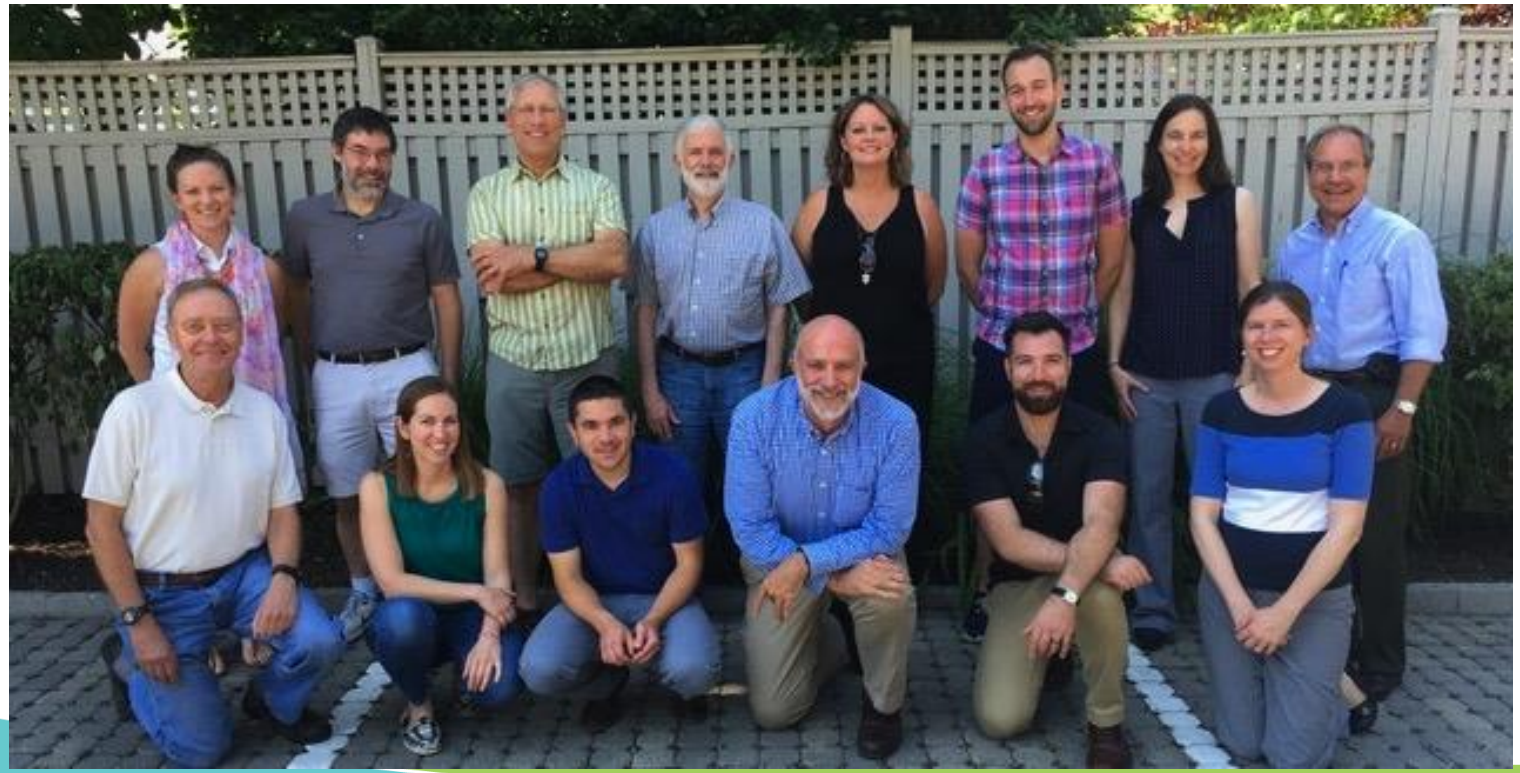
1. What are the long term SAV trends in Chesapeake Bay?

   Nutrient reductions have led to SAV recovery since the 1980s

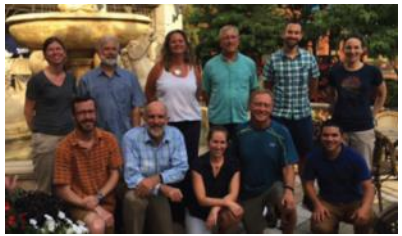
2. How are the trends related to human activities?

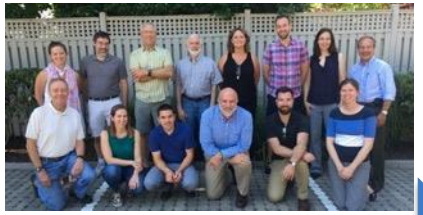
   Nutrient pollution reduces SAV; species enrichment enhances SAV

Limited size



Multiple immersive workshops





July 2016

Sept 2016

Jan 2017

Feb 2017

Aug 2017

Oct 2017

Apr 2018


Multiple stressors threaten the imperiled coastal foundation species eelgrass (Zostera marina) in Chesapeake Bay, USA


Long-term nutrient reductions lead to the unprecedented recovery of a temperate coastal region

Regular communication

Bill Dennison	Fwd: Bay Journal article on our PNAS paper - Robert J Orth CC: Jonathan Lefcheck , Bill Dennison (dennison@umc	Apr 3
Bill Dennison	Fwd: Bay Journal article on our PNAS paper - Robert J Orth CC: Jonathan Lefcheck , Bill Dennison (dennison@umc	Apr 3
Robert J Orth	Inbox **RE: [EXTERNAL] Segment conference call Wed.** - Robert J **Orth**; Bill Dennison (dennison@umces.edu); I	**Apr 3**
Brooke Landry -DNR-	Inbox Re: [EXTERNAL] Segment conference call Wed. - Robert J Orth wrote: >>> >>>> Is supposed to be an upda	Apr 3
Keisman, Jennifer	Inbox **Re: [EXTERNAL] Segment conference call Wed.** - Robert J **Orth** wrote: >> >>> Is supposed to be an upd	**Apr 3**
Brooke Landry -DNR-	Inbox **Re: [EXTERNAL] Segment conference call Wed.** - Robert J **Orth** wrote: > >> Is supposed to be an update	**Apr 3**
Keisman, Jennifer	Inbox **Re: [EXTERNAL] Segment conference call Wed.** - Robert J **Orth** wrote: > Is supposed to be an update on	**Apr 3**
Robert J Orth	Inbox **RE: Responses! th**	
Melissa Merritt	Inbox **RE: Responses! th**	
Robert J Orth	Inbox **RE: Responses! th**	
Jonathan Lefcheck	Inbox **RE: Responses! th**	
David J Wilcox	Inbox **RE: Responses! th**	
David J Wilcox	Inbox **RE: Responses! th**	
Melissa Merritt	Inbox conf line for tomorro	
Melissa Merritt	Inbox **RE: conf line for to**	

Robert J Orth	Inbox	**conf line for tomorrow** - Melissa: Can you set up a conf line for all of us to call in to review the segment wo	**Apr 3**
Robert J Orth	Inbox	**RE: [EXTERNAL] Segment conference call Wed.** - Robert J **Orth** Cc: Bill Dennison (dennison@umces.ed	**Apr 3**
Robert J Orth	Inbox	**RE: Double-checking which SAV goal we are using for the segment summaries** - Robert J **Orth** Cc: Da	**Apr 3**
David J Wilcox	Inbox	**RE: Double-checking which SAV goal we are using for the segment summaries** - Robert J **Orth** Cc: Da	**Apr 3**
Batiuk, Rich	Inbox	**RE: Double-checking which SAV goal we are using for the segment summaries** - Robert J **Orth** Cc: Da	**Apr 3**
David J Wilcox	Inbox	**RE: Double-checking which SAV goal we are using for the segment summaries** - Robert J **Orth** Cc: Da	**Apr 3**
Keisman, Jennifer	Inbox	**Re: [EXTERNAL] Segment conference call Wed.** - @usgs.gov 443-498-5565 On Mon, Apr 2, 2018 at 9:41	**Apr 3**
Brooke Landry -DNR-	Inbox	**Re: Double-checking which SAV goal we are using for the segment summaries** - Robert J **Orth** wrote: >	**Apr 3**
Robert J Orth	Inbox	RE: Double-checking which SAV goal we are using for the segment summaries - Robert J Orth; Jonathan Le	Apr 3
Robert J Orth	Inbox	**RE: Responses! the segment work - full speed ahead** - Robert J **Orth**; Melissa Merritt Cc: Brooke Landry	**Apr 3**
Jonathan Lefcheck	Inbox	RE: Responses! the segment work - full speed ahead - Robert J Orth; Melissa Merritt Cc: Brooke Landry; Bill	Apr 3
David J Wilcox	Inbox	**RE: Responses! the segment work - full speed ahead** - Robert J **Orth** ; Melissa Merritt Cc: Brooke Landry	**Apr 3**
Jonathan Lefcheck	Inbox	**RE: Responses! the segment work - full speed ahead** - Robert J **Orth**; Melissa Merritt Cc: Brooke Landry	**Apr 3**
David J Wilcox	Inbox	**RE: Responses! the segment work - full speed ahead** - Robert J **Orth** ; Melissa Merritt Cc: Brooke Landry	**Apr 3**
Jonathan Lefcheck	Inbox	**RE: Responses! the segment work - full speed ahead** - Robert J **Orth**; Melissa Merritt Cc: Brooke Landry	**Apr 3**
David J Wilcox	Inbox	**RE: Responses! the segment work - full speed ahead** - Robert J **Orth** Sent: Tuesday, April 03, 2018 8:57	**Apr 3**

Flexibility

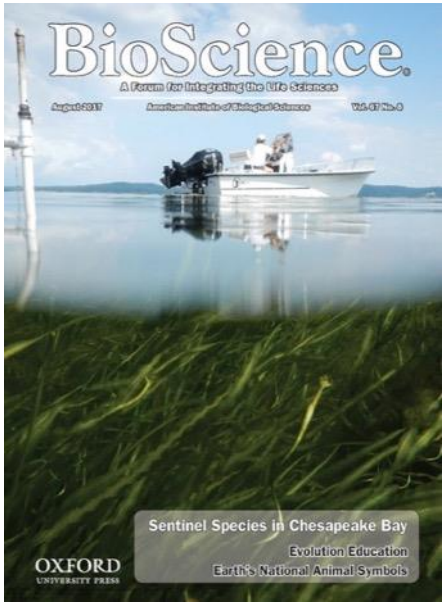
SAV Status and Trends
Agenda Feb. 1 and 2, 2018
IAN Conference Room, Annapolis, MD

Thursday	9:00-9:30	Review PNAS Media Strategy
	9:30-10:30	Review, revise, and finalize segments recently completed
	10:30-11:00	COFFEE BREAK
	11:00-12:30	Identify next set of segments for analysis and begin process of developing the SAV storyline for them
	12:30-1:30	LUNCH
	1:30-3:00	Continue analysis
	3:00-3:30	COFFEE BREAK
	3:30-5:30	Continue analysis

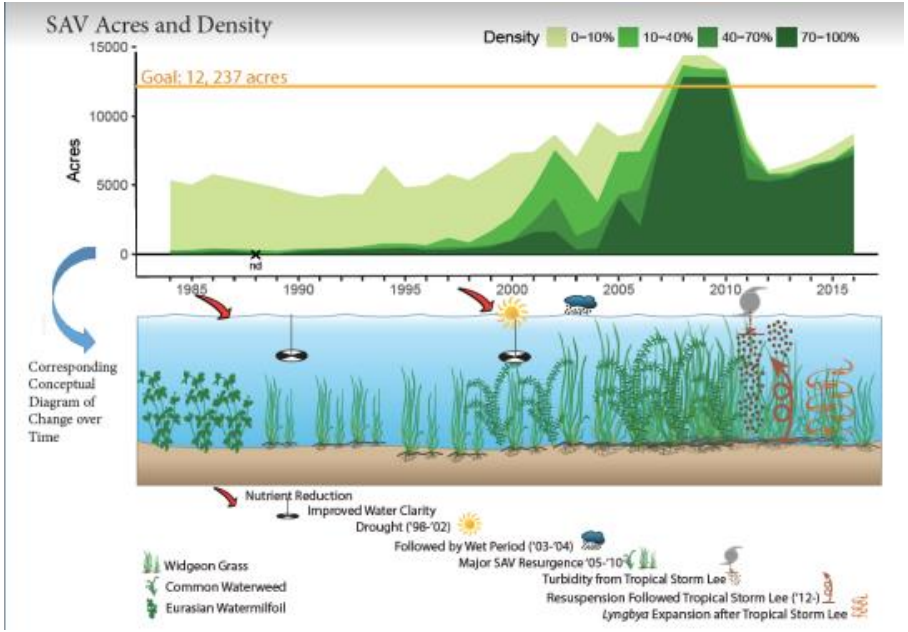
Friday	8:30-10:30	Summary first day – Continue segment analysis
	10:30-11:00	COFFEE BREAK
	11:00-12:00	Continue segment analysis
	12:00-1:00	LUNCH
	1:00-2:30	Review Progress and set date for next segment meeting

Product focus

Peer review papers



Segment analysis



Conducive location

Walk-able restaurants, coffee shops, bars & hotels

Fun

The Chesapeake Sentinels

27 Jan 2017

William C. Dennison

Submerged aquatic vegetation are an important mainstay

They provide homes to many of the little critters

So if we lost the sentinels, the critters would get the jitters.

Defending against erosion and protecting the coastline

These aquatic grasses are not at all benign

They suck up nutrients, and cause sediments to drop out

Cleaning the water in the Bay beyond any doubt.

Indicators for water quality, acting as a coastal canary

Declining when water gets too warm or too cloudy

They are sensitive to subtle changes in nature

So we can recognize signs of imminent danger.