SUMMER QUARTERLY MEETING – June 27th, 2023

Chesapeake Bay Program

Submerged Aquatic Vegetation Workgroup Updates

Brooke Landry
Maryland DNR and
Chair, SAV Workgroup

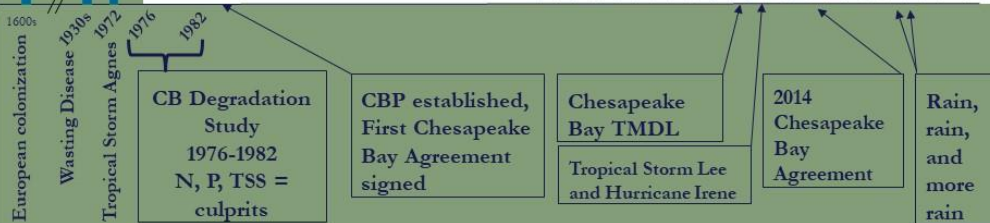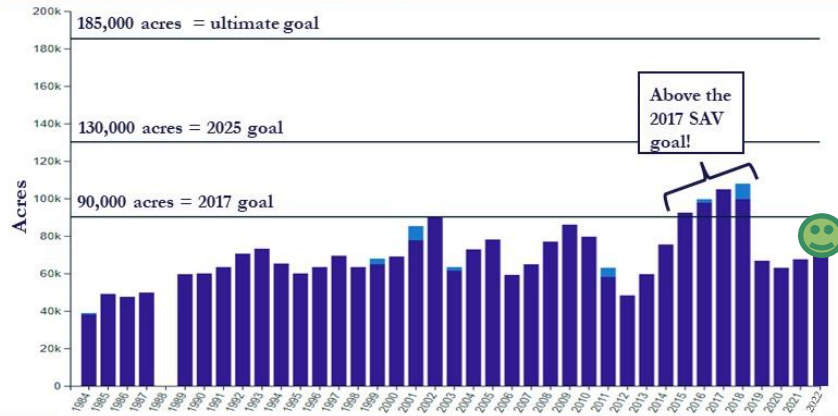# Goal: *Vital Habitats*

Outcome:

Sustain and increase the habitat benefits of SAV in the Chesapeake Bay. Achieve and sustain the ultimate outcome of 185,000 acres of SAV Bay-wide necessary for a restored Bay. Progress toward this ultimate outcome will be measured against a target of 90,000 acres by 2017 and 130,000 acres by 2025.
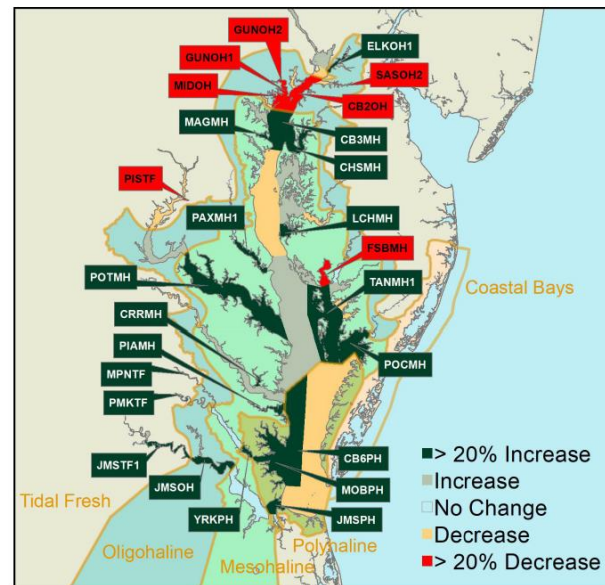
What is our Progress?

SAV #s were up in 2022!
- 2022#s are embargoed until CBP PR July 6th, 2023

Progress towards the Bay-wide SAV goal

Submerged Aquatic Vegetation Abundance (1984-2022)

- 185,000 acres = ultimate goal
- 130,000 acres = 2025 goal
- 90,000 acres = 2017 goal

Above the 2017 SAV goal!

European colonization — 1600s
Wasting Disease — 1930s
Tropical Storm Agnes — 1972
1976
1982

CB Degradation Study 1976-1982 N, P, TSS = culprits

CBP established, First Chesapeake Bay Agreement signed

Chesapeake Bay TMDL

Tropical Storm Lee and Hurricane Irene

2014 Chesapeake Bay Agreement

Rain, rain, and more rain

> 20% Increase
Increase
No Change
Decrease
> 20% Decrease

https://www.chesapeakeprogress.com/abundant-life/sav

Commercial Break
~brought to you by VIMS~

2023 SAV Attainability Update for Strategy Review System

OUTLOOK OFF COURSE

Submerged Aquatic Vegetation (SAV)

Outcome

Sustain and increase the habitat benefits of submerged aquatic vegetation (SAV) in the Chesapeake Bay. Achieve and sustain the ultimate outcome of 185,000 acres of SAV Bay-wide necessary for a restored Bay. Progress toward this ultimate outcome will be measured against a target of 90,000 acres by 2017 and 130,000 acres by 2025.

Status

Between 2014 and 2018, SAV expanded by almost 33,000 acres in Chesapeake Bay, reaching approximately 108,000 acres in 2018, the highest acreage recorded since the annual Bay-wide SAV surveys began in 1984. Because of this record increase, SAV acreage exceeded the 2017 target of 90,000 acres in 2015, 2016, 2017, and 2018. Between 2018 and 2019, however, over 44,000 acres were lost, approximately one-third of the Bay's SAV. This loss has been attributed to degraded water clarity following two years of above-normal precipitation and subsequent high flows. Since that time, SAV has slowly begun to rebound, with the most recent data, collected in 2022, showing 76,462 acres of SAV throughout the Bay and its tidal tributaries. Additional years of increased acreage will help clarify whether this recent gain is the start of a new positive trend, but it is unlikely that the interim goal of 130,000 acres will be reached by 2025 regardless. Therefore, the SAV Outcome is considered off-course. The interim goal of 130,000 acres remains attainable in the future if additional management actions are taken to ensure long-term and consistent improvements in water clarity and shallow water habitat protection. The SAV Workgroup, however, recommends reevaluating the ultimate SAV acreage goal of 185,000 acres to determine if it should be updated. This goal was based on historical SAV distribution in Chesapeake Bay and conditions that may not be met again in the future given the projected effects of climate change.

Beyond 2025 Strategy Review System

What has helped achieve success since 2014?
• Management solutions
• Direct, small-scale, SAV restoration
• Collaboration and community engagement
• Increased research and monitoring

What challenges have hindered progress?
• Pollution reductions have been inadequate to consistently improve water clarity
• Climate change impacts
• Existing statutes, regulations, and policies have been inadequate
• Shallow water use conflicts and habitat trade-offs
• Inadequate staffing, training, and funding

What is needed to accelerate progress?

• Nutrient and sediment reductions *beyond* those currently allocated in the TMDL
• Community-specific understanding of both SAV patterns and processes
• Significant financial investments for direct SAV restoration
• An expanded monitoring effort that includes *Zannichellia*
• Structured decision making to equitably and effectively manage habitat trade-offs and shallow-water use conflicts

CBP Strategy Review System
SAV Management Strategy and Logic and Action Table/2-Year Workplan
–
SRS process is starting again in October to begin developing the 2024-2025 Updated Management Strategy and SAV Workplan

Chesapeake Bay Program

Submerged Aquatic Vegetation Outcome
Management Strategy
2015–2025, v.4

Water stargrass (Heteranthera dubia) in the clear waters of the upper Potomac River, Maryland on July 28th, 2019. (Photo by Brooke Landry/Maryland Department of Natural Resources)

I. Introduction

Submerged aquatic vegetation (SAV), or underwater grasses, provide significant benefits to aquatic life and serve critical functions in the Chesapeake Bay ecosystem. Underwater grasses provide food, habitat and nursery grounds for a number of commercially and ecologically important finfish and shellfish, such as striped bass and blue crabs, and migratory waterfowl. They reduce erosion by slowing currents and softening waves, anchor bottom sediments and help keep the water clear by absorbing nutrients and trapping sediments. Through photosynthesis, underwater grasses act as a carbon sink by taking in carbon dioxide. This contributes to the reduction of greenhouse gas emissions and reduces the potential for climate change impacts. Likewise, underwater grasses also produce oxygen, which helps sustain other aquatic life. Increasing the abundance of underwater grasses in the Bay and its rivers will dramatically improve the entire Bay ecosystem.

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BIENNIAL STRATEGY REVIEW SYSTEM
Chesapeake Bay Program

Logic and Action Plan: Post-Quarterly Progress Meeting

Submerged Aquatic Vegetation – 2022-2023
Long-term Target: Achieve and sustain the ultimate outcome of 185,000 acres of SAV Bay-wide; 130,000 acres by 2025
Two-year Target: To reach our 2025 goal of 130,000 acres, baywide SAV should increase by 16,000 acres per year. By 2023, we hope to achieve 98,000 acres of SAV, but a short-term target is not officially defined.

Factor	Current Efforts	Gap	Actions	Metrics	Expected Response and Application	Learn/Adapt
What is impacting our ability to achieve our outcome?	What current efforts are addressing this factor?	What further efforts or information are needed to fully address this factor?	What actions are essential (to help fill this gap) to achieve our outcome?	What will we measure or observe to determine progress in filling identified gap?	How and when do we expect these actions to address the identified gap? How might that affect our work going forward?	What did we learn from taking this action? How will this lesson impact our work?
Factor 1. Habitat Condition and Availability: SAV requires suitable water quality and clarity to recover and thrive as well as suitable shallow-water habitat in which to expand.	**Effort 1.1** The Bay TMDL was established to limit the amount of N, P and TSS entering the Chesapeake Bay. Reductions in N, P and TSS improve water clarity, which allows SAV to recover.	**Gap 1.1** Although SAV throughout the Bay has been shown to respond to improvements in water quality, it is also susceptible to degradation of water quality, particularly when impacted by multiple stressors, which we observed	**Action 1.1a** [Support WQ GIT in their efforts to improve water quality through the Bay TMDL and achieve water clarity/SAV standards in areas designated for SAV use.]	**Metric 1.1a** Acres of SAV mapped (Bay-wide aerial survey)	**Response 1.1a** Further improvements in water clarity will greatly affect the ability of SAV populations in the Bay to gain or maintain resilience against climate stressors; benefits of improved water	

Updated March 9, 2022   Page 1 of 26

https://www.chesapeakebay.net/who/group/submerged-aquatic-vegetation-workgroup

SAV Regulatory Review and SAV Mitigation Success Criteria Discussions Continue – More from Becky next

Existing Chesapeake Bay Watershed Statutes and Regulations Affecting Submerged Aquatic Vegetation

SAV Policy Discussion
March 7, 2023

Developing Success Criteria & Performance Standards for in-kind SAV mitigation projects

Becky Golden
SAV Workgroup Meeting
3.15.23

https://www.chesapeakebay.net/who/group/submerged-aquatic-vegetation-workgroup

Modeling Climate Impacts on SAV in Chesapeake Bay: Complete!
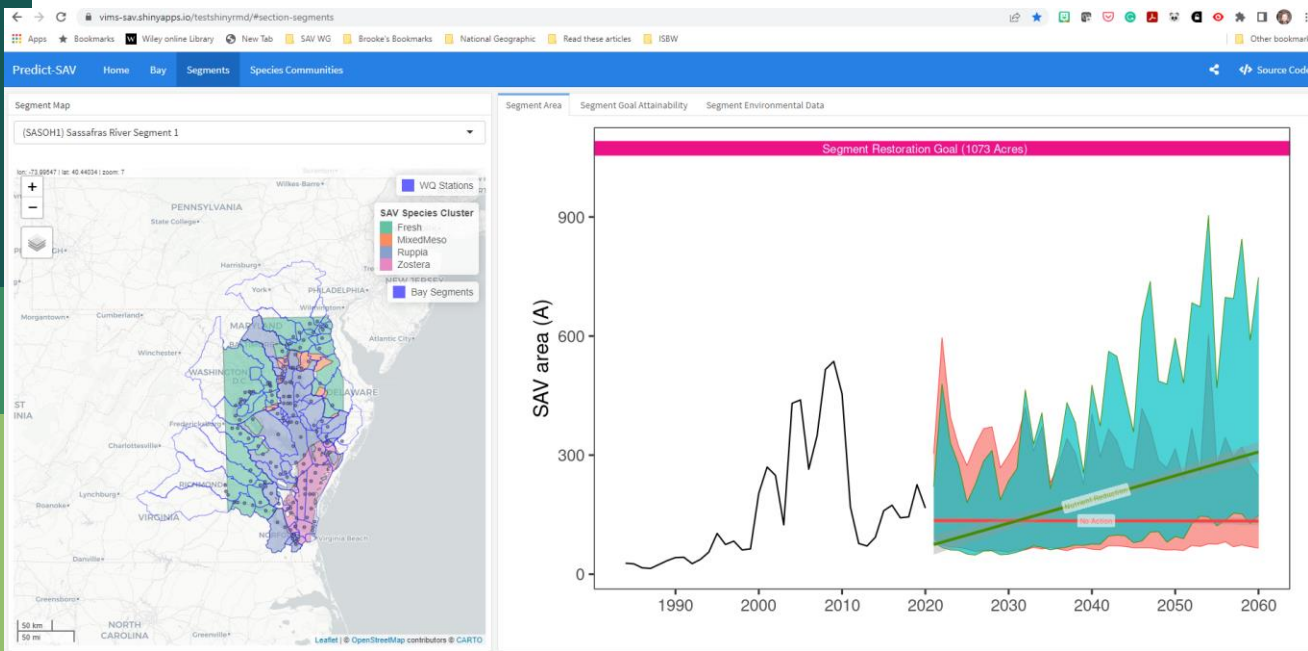
Take home message:
None of the 8000 simulations resulted in meeting our SAV restoration target BUT accelerated and expanded nutrient management will get us closer than if we stick to the current allocations dictated in the TMDL.

2022 GIT-Funded Project
Lead: SAV Workgroup

Protecting Chesapeake Bay SAV Given Changing Hydrologic Conditions: Priority SAV Area Identification and Solutions Development

Project Objective

This project will identify high-priority SAV areas within the Chesapeake Bay Watershed and determine which BMPs could be most effective in protecting those areas from loss during high-flow events/years using GIS spatial analysis/modeling and existing SAV, flow, land-use, and water quality data. With this information, steps can be taken to target high-priority SAV areas for implementation of BMPs and land management policies that will protect or restore those priority SAV habitats.

Update: Congratulations Tetra Tech!
- Steering committee
- Priority area identification

SAV Sentinel Site Program – finally beginning in 2023!

Tier III: Chesapeake Bay SAV Sentinel Site Program

A detailed, long-term SAV data collection effort at several representative locations throughout the Bay and its tidal tributaries. These data help identify causal relationships by monitoring drivers of change, ecosystem responses, and ecological processes.

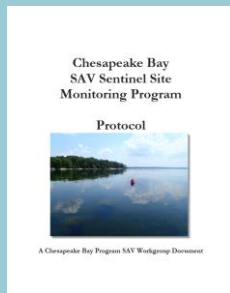### TIER III
SAV Sentinel Site Program — MOST SPECIFIC

WHO IS MONITORING?
Chesapeake Bay Program SAV workgroup and partners

YEAR STARTED
2022

LOCATION
~20 representative sites throughout the Bay

PURPOSE?
Identifying causal relationships by intensively monitoring ecological processes, drivers of change and ecosystem responses.

WHAT PARAMETERS ARE MONITORED?
Parameters measured in Tier 2 plus cover of each SAV species present macroalgae, canopy height, epiphyte loading, shoot density, indications of disease or lesions, indications of herbivory, biomass and water quality properties including temperature, pH, salinity, chlorophyll a, turbidity/total suspended solids and dissolved oxygen concentration.

Tier III: SAV Sentinel Site Program

The SAV Sentinel Site Program is a monitoring effort conducted by Bay scientists

What is the Chesapeake Bay SAV Sentinel Site Program?

The Chesapeake Bay SAV Sentinel Site Program forms the third tier of the Chesapeake Bay SAV Monitoring effort. SAV sentinel sites are located in each of the Bay's four salinity zones (tidal fresh, oligohaline, mesohaline and polyhaline) and are monitored using a standardized, in-depth data collection protocol. These sentinel sites are a combination of existing, long-term sites and new sites where Bay scientists monitor changes in SAV habitat characteristics and resilience indicators. This program is coordinated by the Bay Program's SAV Workgroup. If you are interested in adopting and managing an SAV Sentinel Site, contact the program coordinator at brooke.landry@maryland.gov.

Sites that will be installed and monitored in 2023:

- Severn River
- Susquehanna Flats
- Smith Island
- Marshy Creek
- Dundee Creek
- St. Mary's
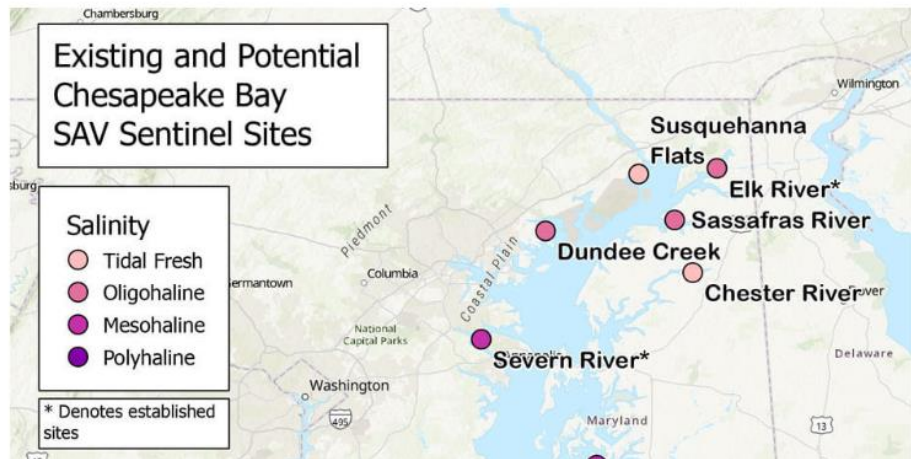- VIMS sites
- CB- NERR sites

Chesapeake Bay
SAV Sentinel Site
Monitoring Program

Protocol

A Chesapeake Bay Program SAV Workgroup Document

Existing and Potential Chesapeake Bay SAV Sentinel Sites

Salinity
- Tidal Fresh
- Oligohaline
- Mesohaline
- Polyhaline

Susquehanna Flats
Elk River*
Sassafras River
Dundee Creek
Chester River*
Severn River*

* Denotes established sites

https://www.chesapeakebay.net/what/programs/monitoring/sav-monitoring-program

Chesapeake Bay SAV Watchers Program

Chesapeake Bay SAV Watchers

Chesapeake Bay SAV Watchers is a program to provide volunteer scientists with an engaging and educational experience with submerged aquatic vegetation (SAV) while also generating useful data for Bay scientists and managers.

This is the first official SAV monitoring program for volunteer scientists developed by the Chesapeake Bay Program.

www.chesapeakebaysavwatchers.com

Chesapeake Bay SAV Watchers – Tier 2 Participation
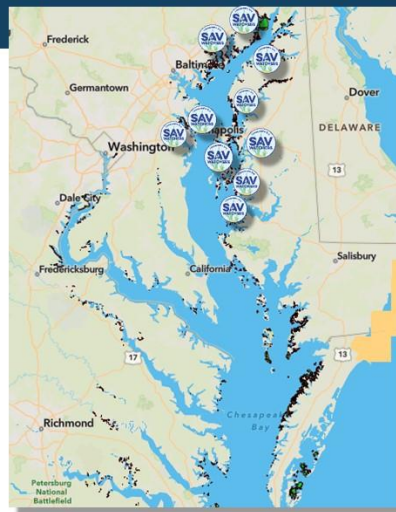
Standardized datasheet and digitization template
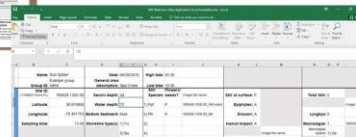
"Train the trainer" certification events offered each summer

www.chesapeakebaysavwatchers.com **OR** https://www.chesapeakebay.net/what/programs/monitoring/sav-monitoring-program

PSC Report and Recommendations - 2 RFPs coming soon

Monitoring Chesapeake Bay's Submerged Aquatic Vegetation (SAV): Program Evolution and Funding Needs
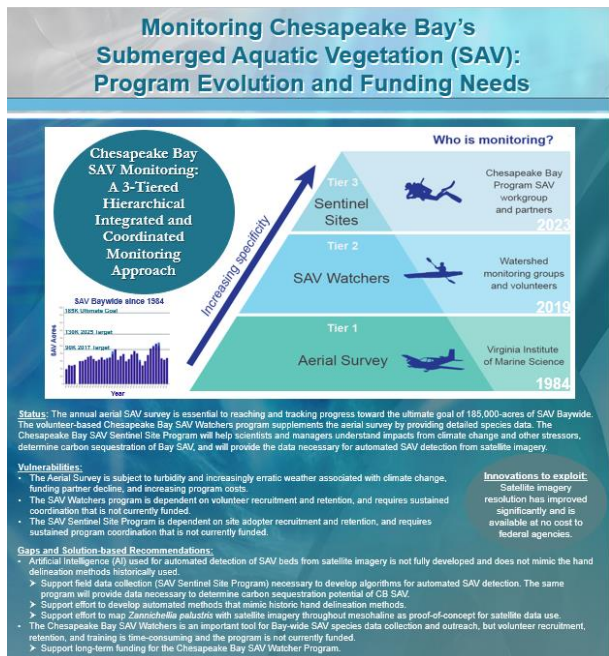
RFP #1 (this summer) will: Support effort to develop automated methods that mimic historic SAV bed delineation methods for aerial imagery. Will also support effort to map *Zannichellia palustris* with satellite imagery throughout mesohaline as proof-of-concept for satellite data use.

RFP #2 (this fall) will: Support long-term funding for the Chesapeake Bay SAV Watcher Program..data entry portal and management, program coordination, etc.

NOAA Funding Opportunity

NOAA Climate Resilience Regional Challenge

A Competitive Funding Opportunity
Approximately $575 million is available for projects that build the resilience of coastal communities to extreme weather (e.g., hurricanes and storm surge) and other impacts of climate change, including sea level rise and drought.

The focus of this grant program is on collaborative approaches to achieving resilience in coastal regions. Proposed projects should address risk reduction, regional collaboration, and equity, and build enduring capacity for adaptation

- **Track One: Regional Collaborative Building and Strategy Development**
- **Track Two: Implementation of Resilience and Adaptation Actions**

The First Step: Outline your proposed project and **submit a letter of intent**. NOAA will invite selected applicants to submit a full application. Details regarding the letter of intent and the application are provided within the funding announcement.

- **Due Dates:** For the letter of intent: Monday, August 21, 2023.
  For the full application: Tuesday, Feb 13, 2024.

- **Eligible Applicants:** Coastal states, territories, counties, cities, tribes, and tribal organizations; public or private nonprofit organizations; and institutions of higher education.

- **Matching Funds:** There is no matching requirement for this funding

- https://coast.noaa.gov/funding/ira/resilience-challenge/

East Coast SAV Collaborative

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Co-chairs:
Brooke Landry, Md DNR
Jessie Jarvis, UNCW
Elizabeth Lacey, Stockton U.

The goal for this collaborative is to bring together experts in SAV research and management from each of the U.S. East Coast states from NC to ME to share ideas and information, provide training and resources, and collaborate on efforts that bring actionable science to the forefront of our SAV management strategies.

Upcoming SAV Collaborative Meetings and Workshops:

- **SAV Remote Sensing Workshop**: July 25th and 26th in Annapolis, MD **(FULL)**
- **First Quarterly meeting**: 2:00 pm July 26th, after workshop. Topic: SAV Sentinel sites

- www.eastcoastsavcollaborative.com
- Join as member: https://forms.gle/9Ks6UX2SHkBPEccx9

Science and Research Needs

Questions?