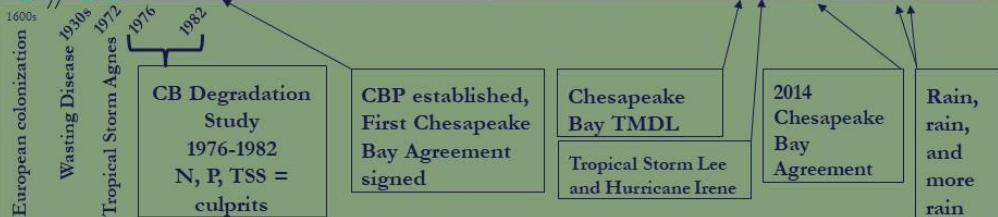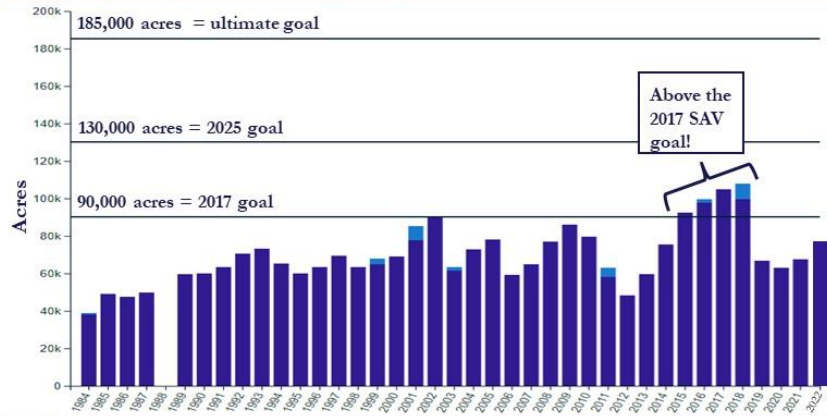# Goal: *Vital Habitats*

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.
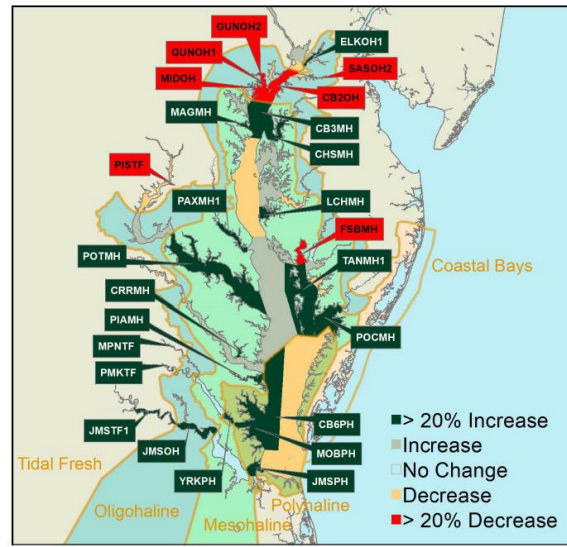
What is our Progress?

Final SAV #s were up in 2022:

- 77,425 acres were mapped in 2022 (+13.8%)
- This is 60% of the 2025 target and 42% of the ultimate 185,000-acre outcome.
- 2023 Preliminary Data expected in June.

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.vims.edu/research/units/programs/sav/access/maps/index.php

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

CBP Strategy Review System
SAV Management Strategy and Logic and Action Table/2-Year Workplan
–
SRS process ran October – March 2024
2024-2025 (V. 5) Updated Management Strategy and SAV Workplan.

Submerged Aquatic Vegetation Outcome
Management Strategy
2015–2025, v.5

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.

1

SAV Workgroup Action Plan
2024-2025

Management Approach 1: Support Efforts to Conserve and Restore Current and Future SAV Habitat and SAV Habitat Conditions.

1.a 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.

- **What are the steps needed for this action?** WQ Management Action 1: Enhance monitoring; Work with Bay states to support implementation of BMPs, encourage enhancement of TMDL.
- **Who are the responsible parties?** Bay States, Water Quality GIT, SAV Workgroup
- **What is the impacted geographic location?** Chesapeake Bay and Chesapeake Bay Watershed
- **What is the expected timeline for completion?** 2025 for this workplan; On-going
- **What are the goals or metrics you will use to determine the impact of your action?** Nutrient and sediment load reductions; water clarity standards attainment; Acres of SAV mapped.
- **How will we collect and assess the data that we want to monitor, how will we use the data, and how will we communicate the results?** Water quality monitoring; annual Bay-wide SAV Survey; CBP communications team; Bay states communication teams
- **How do we expect the action to fill the priority factor or gap? What do you expect to happen when the action is completed?** Further improvements in water clarity will greatly affect the ability of SAV populations in the Bay to gain or maintain resilience against climate stressors. SAV is heavily dependent on sufficient water quality for growth; improved water quality will support SAV expansion and goal attainment.

1.b Determine the local effect of flow/stormwater runoff on SAV density and acreage and options for targeting BMPs that would protect priority SAV areas. This is a current SAV Workgroup GIT-funded project contracted to Tetra Tech for completion.
- **What are the steps needed for this action?** Tetra Tech will follow the protocol established in the project QAPP and Scope of Work.
- **Who are the responsible parties?** Tetra Tech (contractor for project), SAV Workgroup (Technical lead on project; Project Steering Committee members), CBP Modeling Team (Steering Committee members), BMP experts (Steering Committee members)
- **What is the impacted geographic location?** Chesapeake Bay and Chesapeake Bay Watershed
- **What is the expected timeline for completion?** This project will be completed in 2025.
- **What are the goals or metrics you will use to determine the impact of your action?** Completed project determining the local effect of flow/runoff on SAV density and acreage and proposed options for targeting BMPs that would protect priority SAV areas.
- **How will we collect and assess the data that we want to monitor, how will we use the data, and how will we communicate the results?** The results of this study will be

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

CBP Strategy Review System
SAV Management Strategy and Logic and Action Table/2-Year Workplan
–
SRS process ran October – March 2024
2024-2025 (V. 5) Updated Management Strategy and SAV Workplan available soon.

Request to Management Board

"We ask that the MB endorse the necessity of **establishing a Shallow Water Habitat Sentinel Site Program** and guide the CBP to take the necessary steps to do so."

This tier-3 monitoring effort would not only monitor the impacts of climate change on the functional value of shallow water habitats throughout the Bay but also track the effectiveness of measures taken beyond 2025. Development and implementation of a CB Shallow Water Habitat Sentinel Site Program was one of the Shallow Water Habitat Small Teams recommendations/strategies to achieve recommendation 2: expand shallow water habitat monitoring.

CBP Strategy Review System
SAV Management Strategy and Logic and Action Table/2-Year Workplan
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Management Board: Go forth and Explore the Possibilities

CBP Strategy Review System
SAV Management Strategy and Logic and Action Table/2-Year Workplan
–
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2024-2025 (V. 5)Updated Management Strategy and SAV Workplan available soon.

Request to Management Board

Step 1: Conduct a STAC Workshop to determine where to place the Sentinel Sites and what parameters to include (ie. toxins, benthos, fish and shellfish, SAV, WQ measurements, etc.). This step would also identify which CBP Workgroups and Goal Teams would be included in this effort.

Step 2: Request GIT or other funding to develop protocols for each parameter to be measured, a QAPP for the program, data portal options, and to identify potential and sustainable funding sources for the program.

Step 3: Secure long-term funding for the Shallow Water Habitat Sentinel Site Program.

Step 4: Implement the Shallow Water Habitat Sentinel Site Program as a CBP and partner effort.

CBP Strategy Review System
SAV Management Strategy and Logic and Action Table/2-Year Workplan
–
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2024-2025 (V. 5)Updated Management Strategy and SAV Workplan available soon.

Applied for STAC Workshop funding. The proposal was NOT funded in Initial Round. STAC asked us to re-apply in June.

Request to Management Board

Step 1: Conduct a STAC Workshop to determine where to place the Sentinel Sites and what parameters to include (ie. toxins, benthos, fish and shellfish, SAV, WQ measurements, etc.). This step would also identify which CBP Workgroups and Goal Teams would be included in this effort.

Step 2: Request GIT or other funding to develop protocols for each parameter to be measured, a QAPP for the program, data portal options, and to identify potential and sustainable funding sources for the program.

Step 3: Secure long-term funding for the Shallow Water Habitat Sentinel Site Program.

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CBP Strategy Review System
SAV Management Strategy and Logic and Action Table/2-Year Workplan
–
SRS process ran October – March 2024
2024-2025 (V. 5)Updated Management Strategy and SAV Workplan available soon.

Request to Management Board

- Step 1: Literature and Existing Program Review; identification of data gaps.
- Step 2: Scoping Workshop.
- Step 3: Full Shallow Water Habitat Sentinel Site Program Development.
- Step 4: Secure long-term funding for the Shallow Water Habitat Sentinel Site Program.
- Step 5: Implement the Shallow Water Habitat Sentinel Site Program as a long-term CBP partnership effort.

Since we didn't get STAC funding for a workshop, we re-envisioned the steps needed and put it for GIT funding for this effort instead to cover Steps 1,2, and 3.
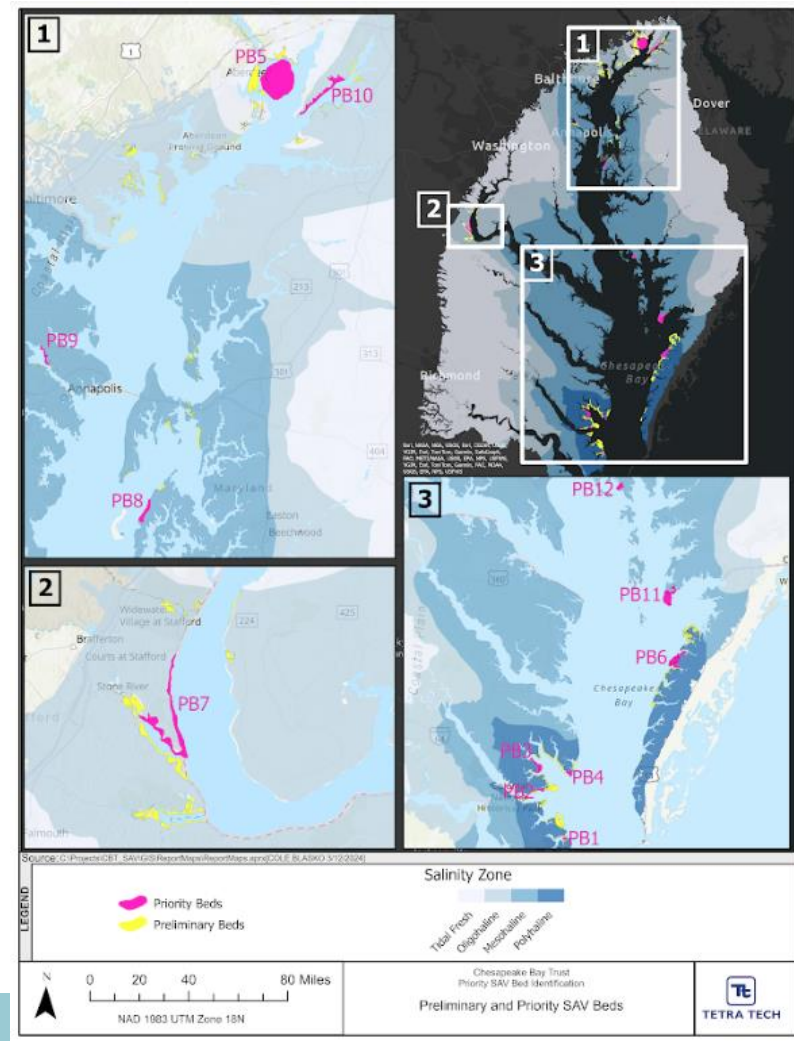
2022 GIT-Funded Project Lead: SAV Workgroup

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.

Contracted to: Tetra Tech

2022 GIT-Funded Project Lead: Comms Workgroup

Advancing Social Marketing Through Two Pilot Programs

Proposed Project Outcomes
This project will develop pilot programs for existing community-based social marketing (CBSM) campaigns that have been developed over the past few years, SAV being one.

Contracted to: OpinionWorks

CHESAPEAKE BAY
I PROTECT BAY GRASS BEDS.

TO LEARN MORE GO TO CHESAPEAKEBAY.NET

Chesapeake Bay Program
Science. Restoration. Partnership.

WHEN BAY GRASSES ARE GREEN, OUR BAY IS CLEAN

The Chesapeake Bay is my Home. I protect Bay grasses because they:

Chesapeake Bay is my Community. I commit:
- To not removing my Bay grasses
- To trim my motors in shallow waters
- To fertilizing my lawn less, or using a Bay-friendly fertilizer
- To following posted speed limits while boating

Join your neighbors and help restore the Chesapeake Bay by protecting your Bay grasses.

SIGN HERE

CHESAPEAKEBAY.NET

WHEN BAY GRASSES ARE GREENER OUR BAY IS CLEANER
Help Protect & Restore the Bay's Underwater Grasses

TO LEARN MORE GO TO CHESAPEAKEBAY.NET

WHEN BAY GRASSES ARE GREEN.
OUR BAY IS CLEAN

Help Protect & Restore the Bay's Underwater Grasses
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Three SAV Watcher Trainer Certification Events planned for 2024:
Marshy Point Nature Center - Havre de Grace maritime Museum
Accokeek Foundation at Port Tobacco

Chesapeake Bay SAV Watchers Program
(program dev for this was also GIT-funded)
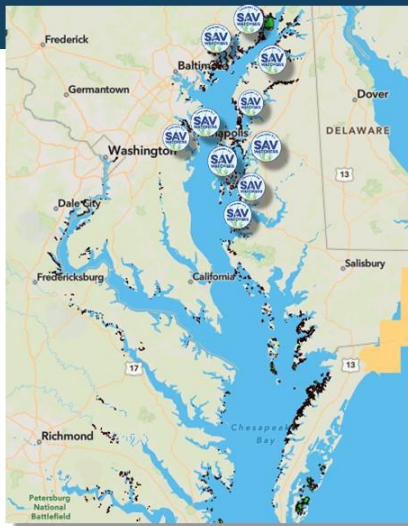
Chesapeake Bay SAV Watchers

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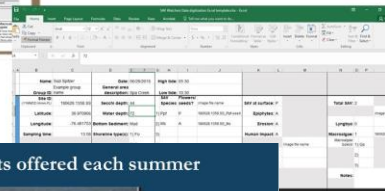
This is the first official SAV monitoring program for volunteer scientists developed by the Chesapeake Bay Program.

www.chesapeakebaysavwatchers.com

Chesapeake Bay SAV Watchers – Tier 2 Participation

ShoreRivers

Havre de Grace MARITIME MUSEUM and Environmental Center

James River ASSOCIATION

SRA Severn River Association
America's Oldest River Group

Magothy River Association
Saving our river for future generations

THE GUNSTON SCHOOL 1911 CENTREVILLE, MD

TEAM BCPS Baltimore County Public Schools
Raising the bar, Closing gaps, Preparing for your future.

MARSHY POINT Nature Center

Chesapeake Bay National Estuarine Research Reserve Maryland
Using Sound Science...Finding Solutions...Promoting Wise Decisions

Arundel Rivers FEDERATION

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

New app:
ArcGIS Survey123

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

SAV Sentinel Site Program – continuing in 2024!

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?	YEAR STARTED	LOCATION
Chesapeake Bay Program SAV workgroup and partners	2022	~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.

Sites that will be installed and monitored in 2024:

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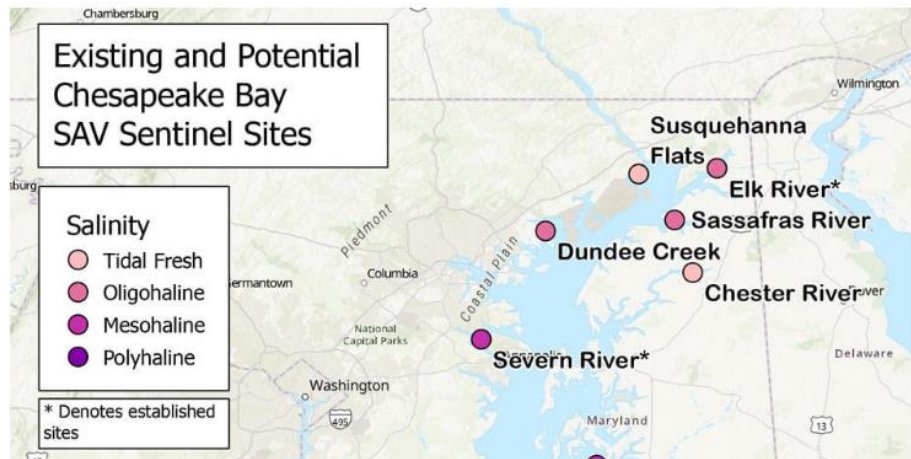- St. Mary's
- VIMS sites
- CB- NERR sites

Chesapeake Bay
SAV Sentinel Site
Monitoring Program

Protocol

A Chesapeake Bay Program SAV Workgroup Document

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.

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

NOAA Funding Opportunity

(funding announcement likely in June)

Proposal 1:

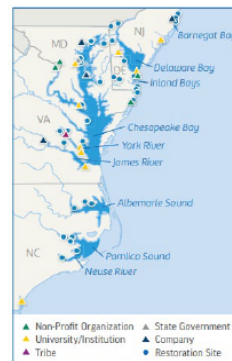**RESTORE AMERICA'S ESTUARIES**

Infrastructure and Capacity Building for Transformational Submerged Aquatic Vegetation Restoration in the Mid-Atlantic United States

Funding Stream: NOAA Transformational Habitat Restoration and Coastal Resilience Grants

Budget Requested: $13,874,547 over 5 years

Submerged aquatic vegetation (SAV) habitat is in crisis globally due to pressure from human development along our coasts and degraded water quality. Due to the ecosystem services that SAV provides, however, its recovery is a priority and steps must be taken to accelerate SAV recovery both locally and nationally.

Restore America's Estuaries (RAE) and its partners propose to enhance SAV restoration capacity throughout the Mid-Atlantic by leveraging substantial existing infrastructure to develop SAV nurseries and seed processing facilities, forge strategic partnerships with the aquaculture industry, conduct direct SAV restoration, develop and implement an SAV restoration training and certification program, and develop accessible SAV lesson plans and community outreach products. Together these project components will significantly enhance the capacity for SAV restoration throughout the mid-Atlantic and serve as an example for SAV restoration efforts nationally.

Key Benefits	Program Partners	
• Build SAV Nurseries and Seed Processing Centers throughout the Mid-Atlantic	**Primary**	**Supporting**
• Expand SAV Restoration Capacity through Aquaculture Industry Partnership	• Tetra Tech • Maryland Department of Natural Resources	• Delaware Center for Inland Bays • Delaware State University • Ferry Cove Oyster Hatchery • Green Fin Studios
• Conduct Direct, Transformative SAV Restoration to Enhance Coastal Climate Resiliency		• Maryland Coastal Bays Program • Mattaponi Indian Tribe and Reservation • Old Dominion University • Smithsonian Environmental Research Center
• Establish an SAV Restoration Training and Certification Program		• St. Mary's College of Maryland • Stockton University • University of Delaware and Delaware Sea Grant • University of North Carolina Wilmington
• Develop K-12 Lesson Plans and Community Outreach Product		• Virginia Institute of Marine Science • Virginia Institute of Marine Science CB NERR • Waterkeepers Chesapeake

Restore America's Estuaries (RAE) is a national leader in the protection and restoration of our nation's estuaries and bays. RAE has over 25 years of experience managing complex programs on behalf of federal agencies, public/private partnerships, corporations and foundations.

Proposal 2: HEAT Helping Eelgrass Adapt to Temperature – this project will conduct common garden experiments with eelgrass from NC to ME, facilitating the migration of more heat tolerant plants northward.

If either of these projects are funded, there will be huge implications for SAV restoration in Chesapeake Bay.

East Coast SAV Collaborative

~

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 East Coast SAV Collaborative Meetings:

- **SAV and Aquaculture:** April 26th, 10am - 1pm
- **Next Meeting**: SAV and Living Shorelines; September 2024
- www.eastcoastsavcollaborative.com

Science and Research Needs

CB SAV Science Needs Google Form and Responses

Chesapeake Bay SAV Workgroup Science Needs_2024 Update

Hello hello SAV Workgroup members!

Please review the following list of SAV science and research needs and in your best professional opinion, indicate whether that need is a 3 (High), 2 (Medium), or 1 (Low) Priority at this time. Other responses for each science need listed include "In progress, not complete" and "We have enough information on this topic to consider it complete and deprioritize it for now with the understanding that there are elements to the question we don't have all the answers for at this time and may need to revisit in the future." I know, I know, that selection is lacking commitment, but are we ever really just finished with a topic? None of the questions are required, so if you are completely unfamiliar with the state of the science on a topic and have no clue how important it is, just skip it. Likewise, there are three questions at the bottom of the list that will allow you to write in any additional SAV science needs that you may consider important. If you add any additional needs, please say whether you think they're high, medium, or low priority.

Thanks everyone! Please complete this form by March 6th so that I can tally responses in time for the March 13th SAV Workgroup Meeting.

brooke.landry@maryland.gov Switch account

* Indicates required question

Email *

Your email

Name *

Your answer

Averaged and Ranked

Science Need	Average Score 1-3	Rank
Zostera v Ruppia Ecosystem Services and impact of shift on fisheries	2.47	1
Research to advance the use of Satellite data in Bay-wide survey	2.44	2
SAV and bivalve co-restoration advantages	2.41	3
Investigate the impacts of climate change on our freshwater SAV community and individual species.	2.40	4
Assess integrated impacts of shallow water uses (e.g. living shorelines, aquaculture) on SAV habitat to determine long-term SAV goal attainability.	2.39	5
Assess the impact of Living shorelines on SAV	2.33	6
Local effect of stormwater runoff and targeted BMPs for SAV priority beds	2.21	7
Increase SAV Restoration Capacity in CB	2.21	8
Expand implementation of CB SAV Sentinel Site Program	2.21	9
Determine future SAV habitat availability in relation to climate change, sea level rise, shoreline alteration, and nearshore development to determine if SAV restoration goals ar	2.18	10
Determine the habitat requirements for recovering SAV (seedlings, juvenile plants) as opposed to mature SAV plants/beds.	2.15	11
Determine carbon sequestration potential in the three primary SAV communities in Chesapeake Bay	2.15	12
Establish a more thorough understanding of climate impacts on SAV biology and ecology in Chesapeake Bay	2.14	13
In situ study of seed based SAV restoration to determine ideal timing for seed broadcasting and other parameters	2.12	14
Impact of hydraulic clamming on SAV and potential SAV habitat.	2.08	15
Determine the contribution of Zannichellia to baywide SAV totals	2.05	16
Conduct further research on fresh and brackish SAV species restoration best practices.	2.00	17
Conduct further SAV/aquaculture research to determine our ability to reach segment-specific and Bay-wide SAV restoration targets.	1.94	18
Determine potential for facilitated migration of Zostera into CB to restore Zm populations	1.79	19
Determine role of microplastics in/on SAV beds	1.60	20

Factors and Gaps → Management Strategies

Factors and Gaps
1. Habitat Condition and Availability
2. Protection of Existing and Recovering SAV
3. SAV Restoration Potential and Activity
4. SAV Research and Monitoring
5. Public Perception, Knowledge, and Engagement

Management Strategies
1. Support Efforts to Conserve and Restore Current and Future SAV Habitat and Habitat Conditions.
2. Protect Existing and Recovering SAV
3. Restore SAV
4. Enhance SAV Research and Monitoring
5. Enhance Community Involvement, Education, and Outreach

Science Need	Average Score 1-3	Rank	Factor/Gap/Approach
Assess integrated impacts of shallow water uses (e.g. living shorelines, aquaculture) on SAV habitat to determine long-term SAV goal attainability.	2.39	5	1 (Habitat Cond and Availability)/2 (Protect SAV)
Assess the impact of Living shorelines on SAV	2.33	6	1 (Habitat Cond and Availability)/2 (Protect SAV)
Local effect of stormwater runoff and targeted BMPs for SAV priority beds	2.21	7	1 (Habitat Cond and Availability)/2 (Protect SAV)
Determine future SAV habitat availability in relation to climate change, sea level rise, shoreline alteration, and nearshore development to determine if SAV restoration goals are feasible.	2.18	10	1 (Habitat Cond and Availability)/2 (Protect SAV)
Impact of hydraulic clamming on SAV and potential SAV habitat.	2.08	15	1 (Habitat Cond and Availability)/2 (Protect SAV)
Conduct further SAV/aquaculture research to determine our ability to reach segment-specific and Bay-wide SAV restoration targets.	1.94	18	1 (Habitat Cond and Availability)/2 (Protect SAV)
SAV and bivalve co-restoration advantages	2.41	3	3 (Restoration)
Increase SAV Restoration Capacity in CB	2.21	8	3 (Restoration)
In situ study of seed based SAV restoration to determine ideal timing for seed broadcasting and other parameters	2.12	14	3 (Restoration)
Conduct further research on fresh and brackish SAV species restoration best practices.	2.00	17	3 (Restoration)
Research to advance the use of Satellite data in Bay-wide survey	2.44	2	4 (Monitoring)
Expand implementation of CB SAV Sentinel Site Program	2.21	9	4 (Monitoring)
Determine the contribution of Zannichellia to baywide SAV totals	2.05	16	4 (Monitoring)
Zostera v Ruppia Ecosystem Services and impact of shift on fisheries	2.47	1	4 (Research)
Investigate the impacts of climate change on our freshwater SAV community and individual species.	2.40	4	4 (Research)
Determine the habitat requirements for recovering SAV (seedlings, juvenile plants) as opposed to mature SAV plants/beds.	2.15	11	4 (Research)
Determine carbon sequestration potential in the three primary SAV communities in Chesapeake Bay	2.15	12	4 (Research)
Establish a more thorough understanding of climate impacts on SAV biology and ecology in Chesapeake Bay (redundant w line 5)	2.14	13	4 (Research)
Determine potential for facilitated migration of Zostera into CB to restore Zm populations	1.79	19	4 (Research)
Determine role of microplastics in/on SAV beds	1.60	20	4 (Research)

Questions?