STAR – February 26th, 2026

Chesapeake Bay Program

Monitoring Submerged Aquatic Vegetation in Chesapeake Bay

Integrated, Tiered, Hierarchical Approach

Increasing specificity

	Who is monitoring?	Year started	Location	Purpose	Parameters monitored
Tier 3 Sentinel Sites	Chesapeake Bay Program SAV Workgroup and Partners	2023	~ 15 sites throughout Chesapeake Bay	Monitors multiple parameters in greater detail at a significantly smaller number of locations. Focuses on identifying causal relationships by intensively monitoring drivers of change, ecosystem responses, and ecological processes.	Parameters measured in Tier 2, plus cover of each SAV species, canopy height, epiphyte loading, shoot density, biomass, indications of disease or herbivory, temperature, pH, salinity, chl a, turbidity, Secchi depth, water column depth, DO
Tier 2 SAV Watchers	Watershed Monitoring Groups and Volunteers	2019	Tributaries throughout Chesapeake Bay	Monitors a limited number of habitat characteristics at a large number of locations. Useful for broad-scale condition assessment and for identifying and quantifying driver/response relationships.	SAV species composition and total cover, presence/absence of seeds, flowers, epiphytes, filamentous macroalgae, indications of human impacts, water column and Secchi depth, sediment type, and shoreline type
Tier 1 Aerial Survey	Virginia Institute of Marine Science	1984	Bay-wide	Characterizes SAV acreage and density and progress towards SAV restoration goals. Useful for quantifying SAV habitat distribution and density throughout the Bay and its tributaries.	SAV acreage and visual cover

Neckles et al. 2012. Integrating Scales of Seagrass Monitoring to Meet Conservation Needs. E&C

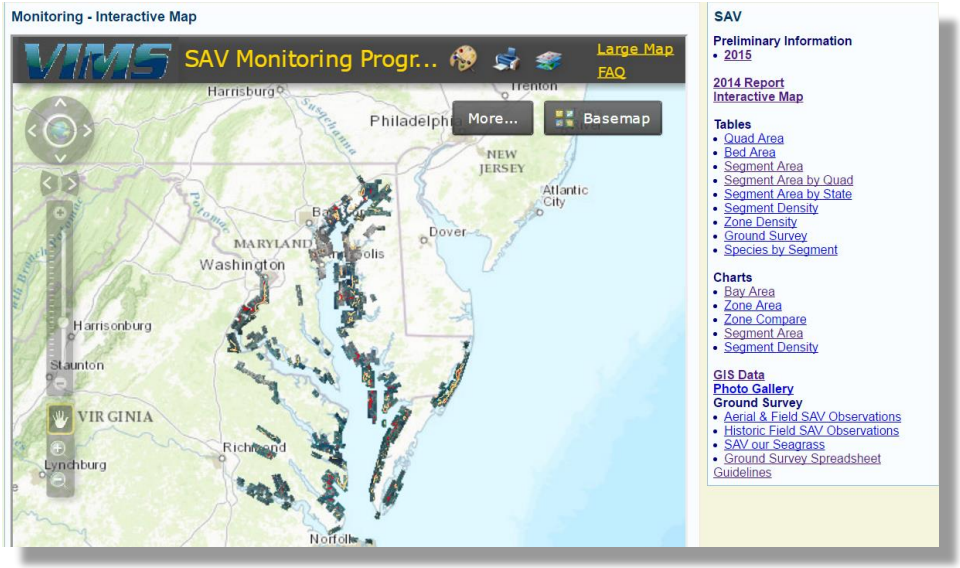
(Figure from Webster et al. 2021)

Integration

Changes in SAV habitat extent or condition detected at Tiers 1 and 2 can direct process-based investigations at Tier 3, and statistical and explanatory models built on Tier 2 and 3 data can be used to interpret and predict patterns and conditions at larger scales.

Tier 1

VIMS Bay-wide Aerial Survey



- Bay-wide Aerial Survey, conducted by VIMS annually May-Oct
- 180+ flight lines using high resolution multispectral imagery
- Ongoing since 1984
- Funded by Federal/State partnership
- Includes the use of satellite imagery to supplement aerial imagery
- Exploring increasing use of satellite data to increase program efficiency and expand temporal coverage

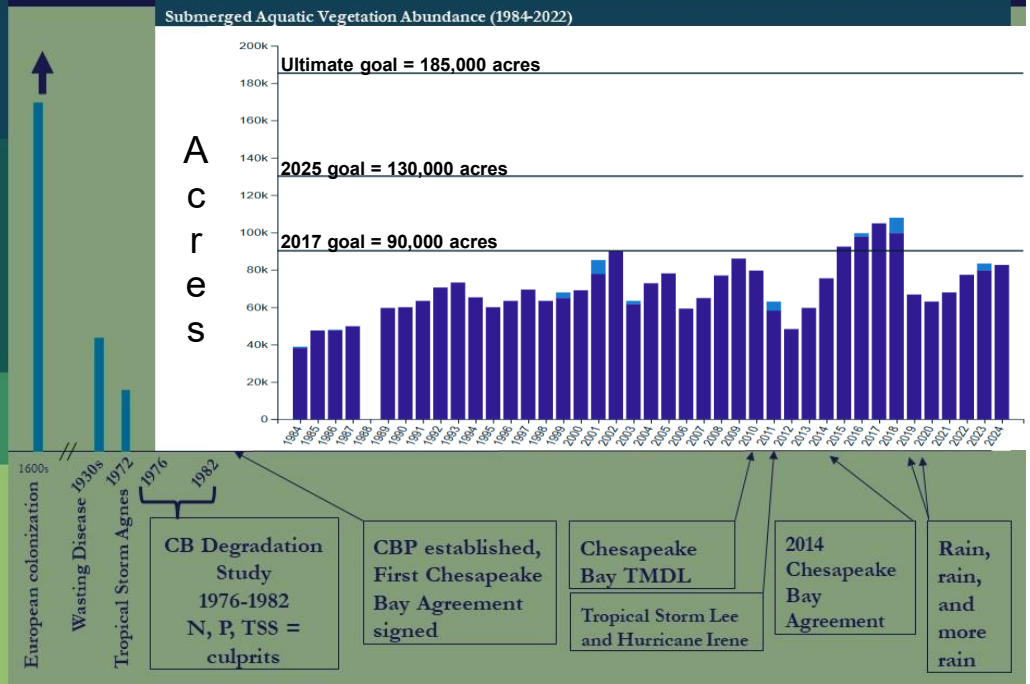
VIMS | William & Mary
Virginia Institute of Marine Science

http://web.vims.edu/bio/sav/

Tier 1

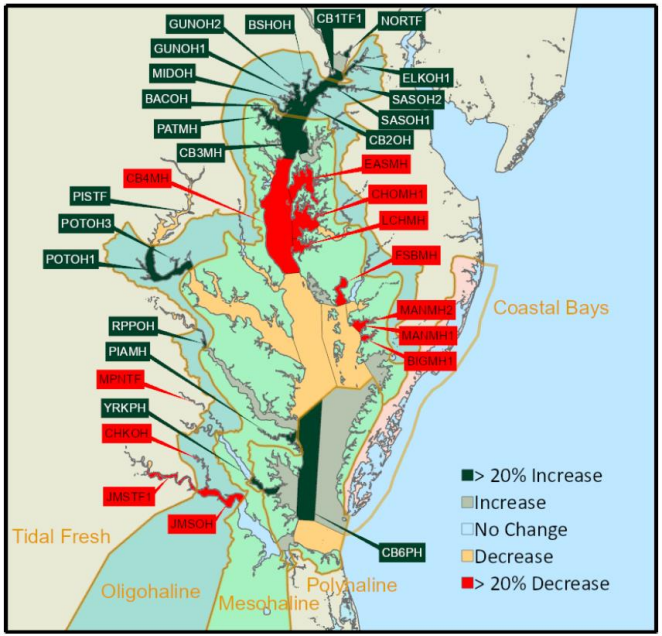
VIMS Bay-wide Aerial Survey

Progress towards the Bay-wide SAV goal



FINAL SAV #s were slightly down in 2024:

- 83,250 acres were mapped in 2024.
- 83,419 total acres of SAV estimated for 2023.
- This is 64% of the Chesapeake Bay Program's 130,000-acre restoration target and 45% of its 185,000-acre goal.
- It is a 114% increase from the 38,958 acres observed during the first underwater grass survey in 1984, but a 0.2% decrease from the 83,419 acres reported in 2023.



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

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

Tier 2

Chesapeake Bay SAV Watchers

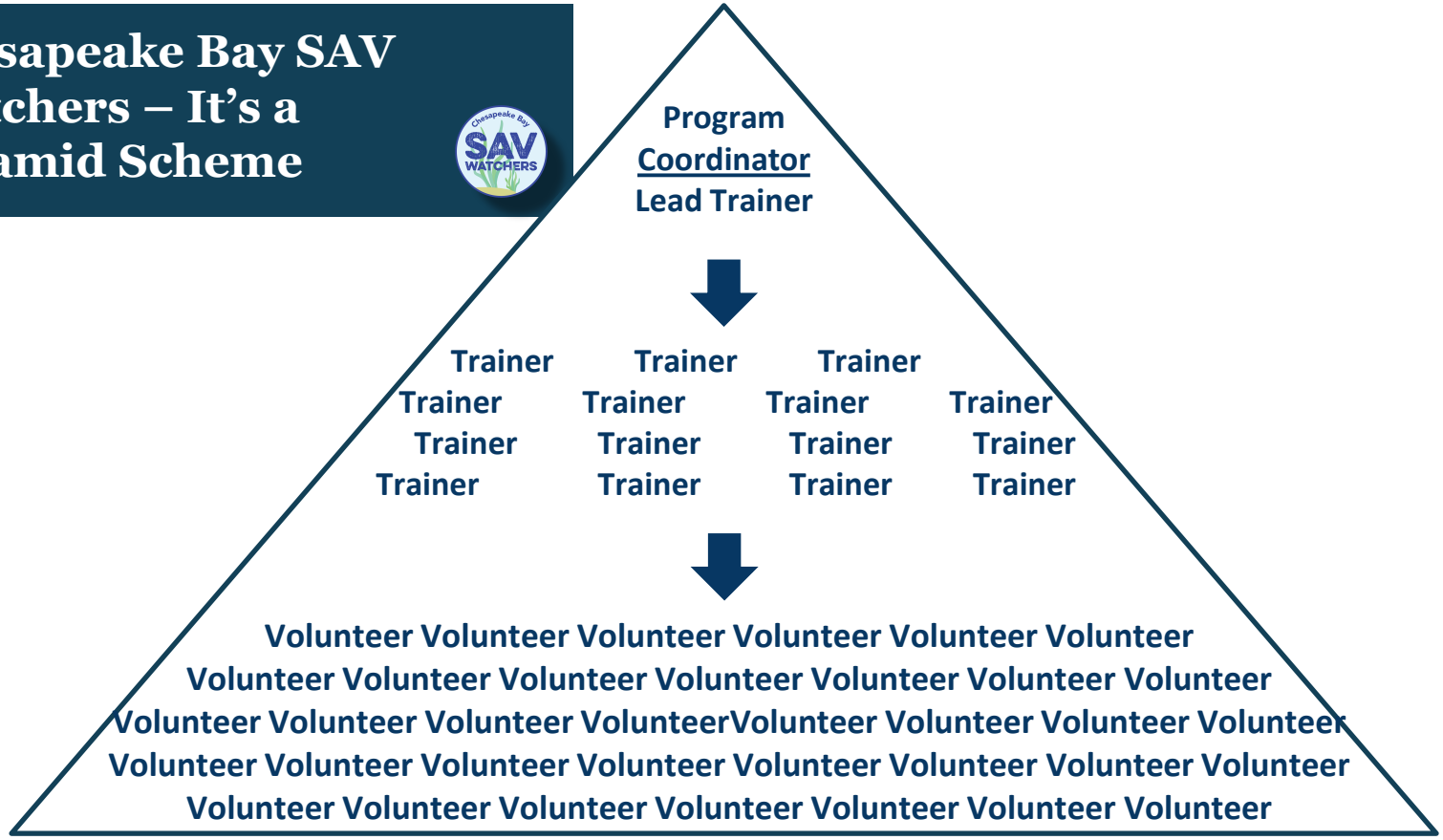
Chesapeake Bay SAV Watchers is a program to provide volunteer scientists with an engaging and educational experience with SAV while also generating useful data for Bay scientists and managers.

This is the first official SAV monitoring program for volunteer scientists developed by the Chesapeake Bay Program (SAV Workgroup GIT Funding)

www.chesapeakebaysavwatchers.com

Tier 2

Chesapeake Bay SAV Watchers – It's a Pyramid Scheme



Tier 2

Chesapeake Bay SAV Watchers – For Most Anyone

This program is for everyone: individuals, riverkeepers, watershed organizations, and school groups!

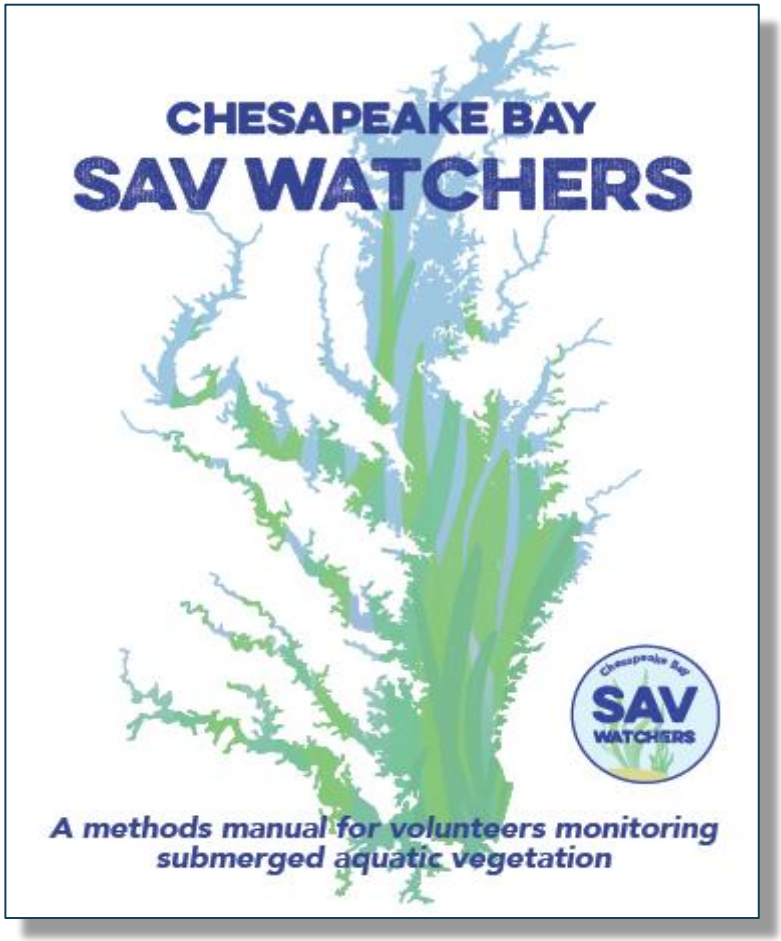
Volunteers can be a:

1. Non-certified Volunteer
2. Certified Volunteer Monitor
3. Certified Trainer

Tier 2

Chesapeake Bay SAV Watchers – Parameters Collected

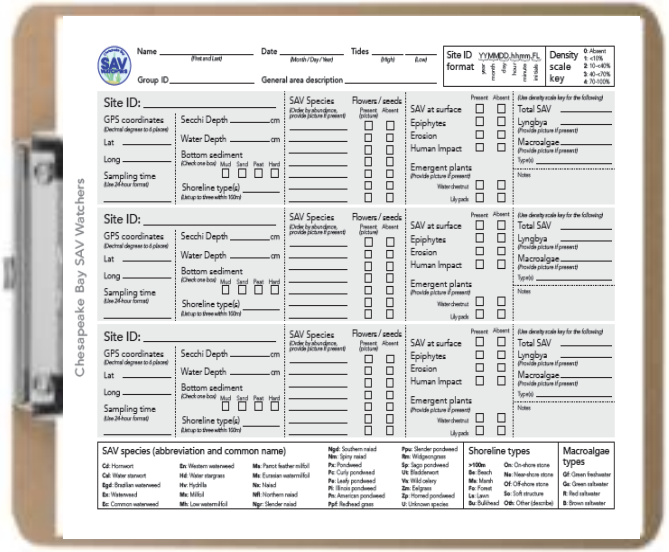
- Total SAV Cover
- SAV species present
- Reproductive status of plants
- Epiphyte presence
- Macroalgae presence
- Microseira (cyanobacteria) presence
- Shoreline features
- Water depth
- Secchi depth
- Bottom type



Tier 2

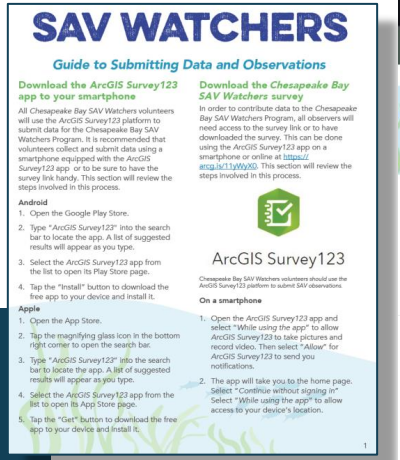
Chesapeake Bay SAV Watchers – Data Collection

Datasheets



ALL data eventually ends up in Survey123 database!

ArcGIS Survey123


SAV WATCHERS

Guide to Submitting Data and Observations

Download the *ArcGIS Survey123* app to your smartphone

All *Chesapeake Bay SAV Watchers* volunteers will use the *ArcGIS Survey123* platform to submit data for the Chesapeake Bay SAV Watchers Program. It is recommended that volunteers collect and submit data using a smartphone equipped with the ArcGIS Survey123 app or to be sure to have the survey link handy. This section will review the steps involved in this process.

Android

1. Open the Google Play Store.
2. Type "*ArcGIS Survey123*" into the search bar to locate the app. A list of suggested results will appear as you type.
3. Select the *ArcGIS Survey123* app from the list to open its Play Store page.
4. Tap the "Install" button to download the free app to your device and install it.

Apple

1. Open the App Store.
2. Tap the magnifying glass icon in the bottom right corner to open the search bar.
3. Type "*ArcGIS Survey123*" into the search bar to locate the app. A list of suggested results will appear as you type.
4. Select the *ArcGIS Survey123* app from the list to open its App Store page.
5. Tap the "Get" button to download the free app to your device and install it.

Download the *Chesapeake Bay SAV Watchers* survey

In order to contribute data to the *Chesapeake Bay SAV Watchers* Program, all observers will need access to the survey link or to have downloaded the survey. This can be done using the *ArcGIS Survey123* app on a smartphone or online at https://arcg.is/1TyWyX0. This section will review the steps involved in this process.

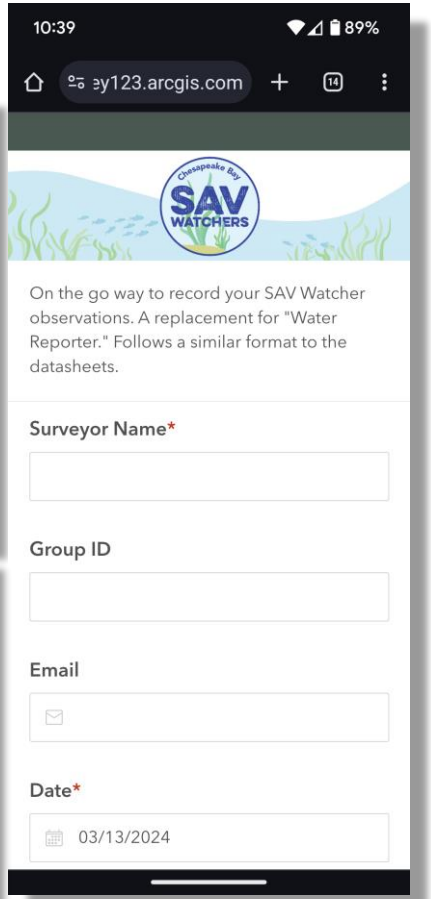
ArcGIS Survey123

Chesapeake Bay SAV Watchers volunteers should use the ArcGIS Survey123 platform to submit SAV observations.

On a smartphone

1. Open the *ArcGIS Survey123* app and select "*While using the app*" to allow *ArcGIS Survey123* to take pictures and record video. Then select "*Allow*" for *ArcGIS Survey123* to send you notifications.
2. The app will take you to the home page. Select "*Continue without signing in*" Select "*While using the app*" to allow access to your device's location.

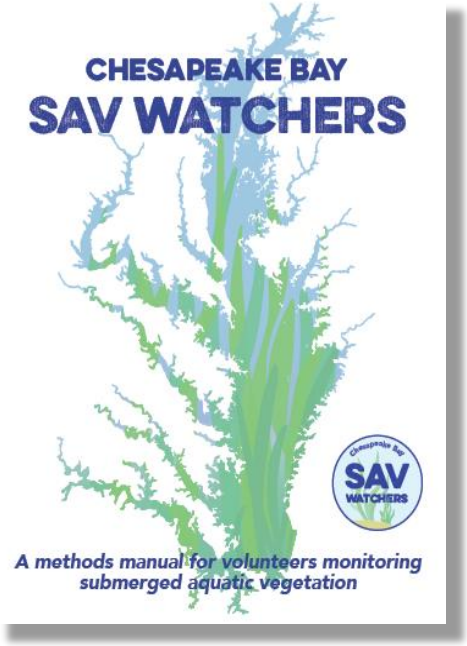
1

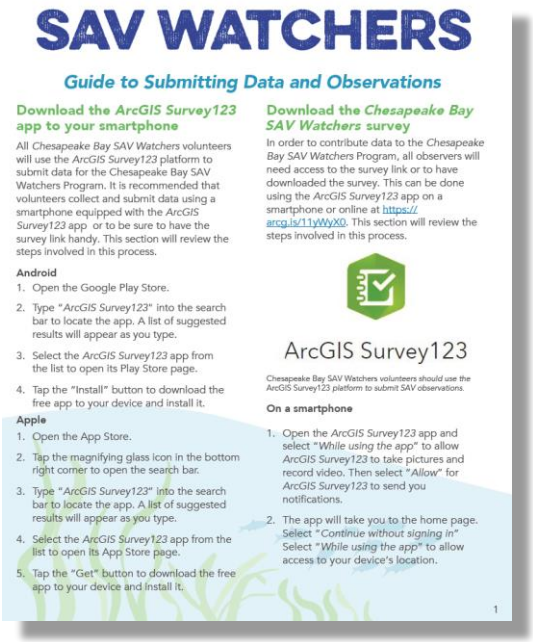


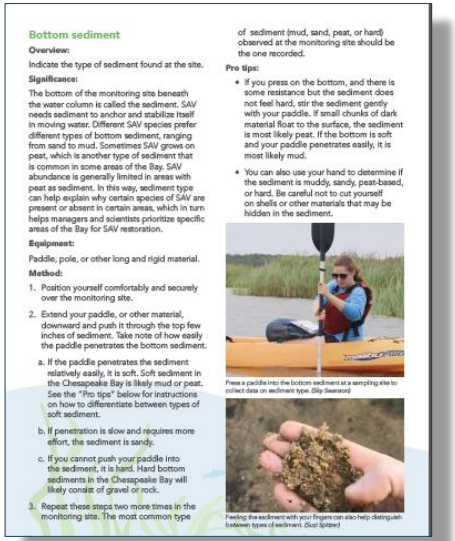
Tier 2

Chesapeake Bay SAV Watchers – Resources

Instructions for measuring each data parameter are in the methods manual and pocket guide and instructions for Survey123 are in the Guide to Submitting Data and Observations!



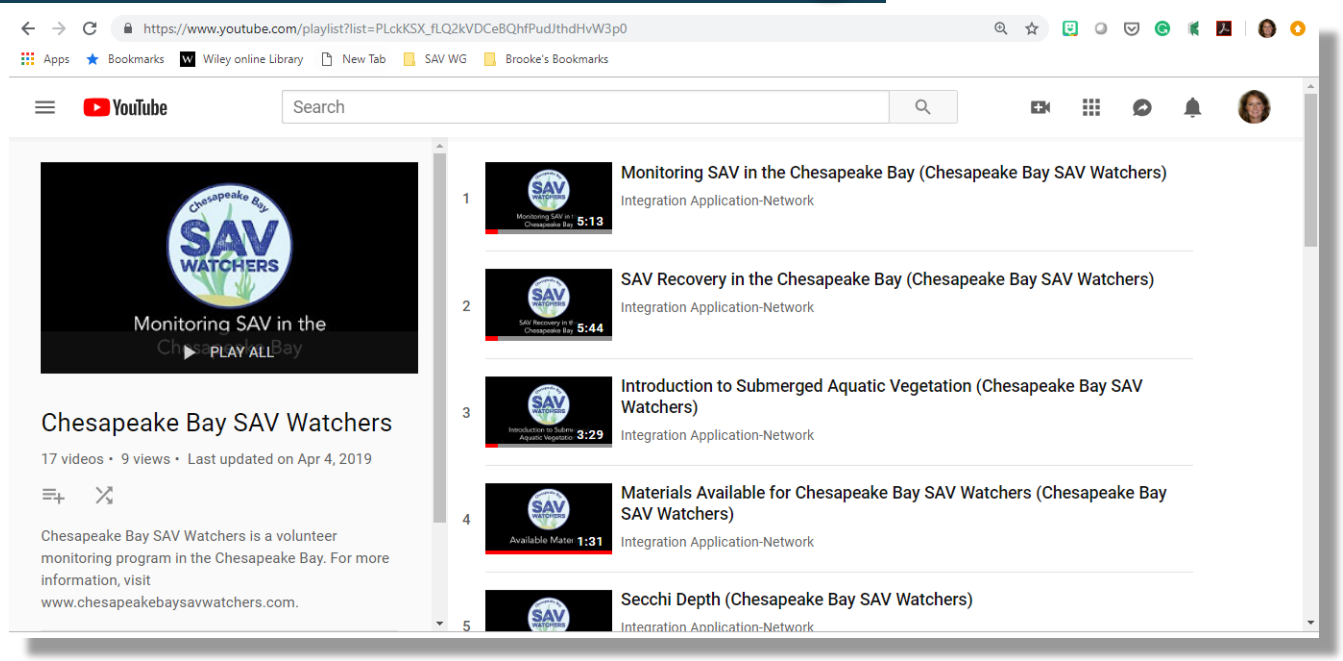




www.chesapeakebaysavwatchers.com

Tier 2

Chesapeake Bay SAV Watchers – YouTube Instructional Videos



https://www.youtube.com/playlist?list=PLckKSX_fLQ2kVDCeBQhfPudJthdHvW3p0

Tier 2

Chesapeake Bay SAV Watchers – Train-the-Trainer Certification Events

Chesapeake Bay SAV Watchers Trainer Training Event Sign up

The Chesapeake Bay Program's SAV Workgroup is offering two "Trainer training" events this summer for the SAV Watchers volunteer SAV monitoring program. As a trainer, you'll be officially certified to train your organization's volunteers to follow the established protocol and monitor SAV in tributaries throughout the Chesapeake Bay.

https://www.youtube.com/playlist?list=PLckKSX_fLQ2kVDCeBQhfPudJthdHvW3p0

Tier 2

Chesapeake Bay SAV Watchers – Signed Certifications

Tier 2

Chesapeake Bay SAV Watchers – Quarterly Newsletter

Subscribe to our Newsletter here:
https://forms.gle/yYwkDPShvBjFCiby5

Tier 2

Chesapeake Bay SAV Watchers – Upcoming Events

SAV Watchers Trainer Events to be on the lookout for in 2026:

- Havre de Grace Maritime Museum Env. Center
- Washington College
- Virginia Institute of Marine Science - ESL
- Virginia Commonwealth University/TNC
- Coastal Bays
- Mallows Bay

2025 Stats:

- 70+ New Trainers in 2025!
- 110+ new data points, 2,747 points total
- Held both 2-day and 1-day trainings

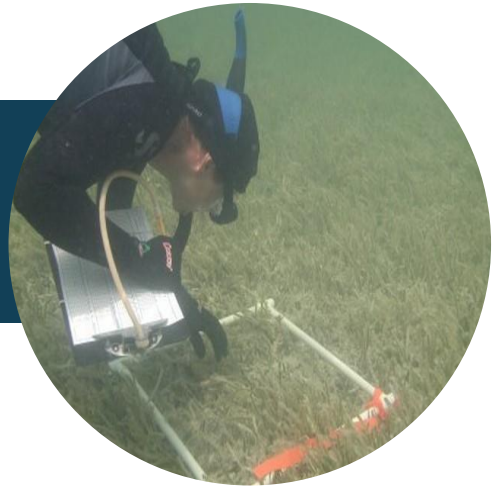
2025 Program Stats - Participating Organizations

TIMMONS GROUP
ST. MARY'S RIVER Watershed Association
EPA
OLD DOMINION UNIVERSITY
SHORERIVERS
Havre de Grace MARITIME MUSEUM and Environmental Center
James River ASSOCIATION
WILLIAM & MARY VIMS Virginia Institute of Marine Science School of Marine Science
Severn River Association America's Oldest River Group
VCU
Magothy River Association
CRISFIELD RESILIENCE ACADEMY
MARITIME MUSEUM ANNAPOLIS
Baltimore County Public Schools
The Nature Conservancy
Arundel Rivers FEDERATION
Chesapeake Bay National Estuarine Research Reserve Maryland
Using Sound Science...Finding Solutions...Promoting Wise Decisions
Washington College
Accokeek Foundation at Piscataway Park

www.chesapeakebaysavwatchers.com

Tier 3

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.

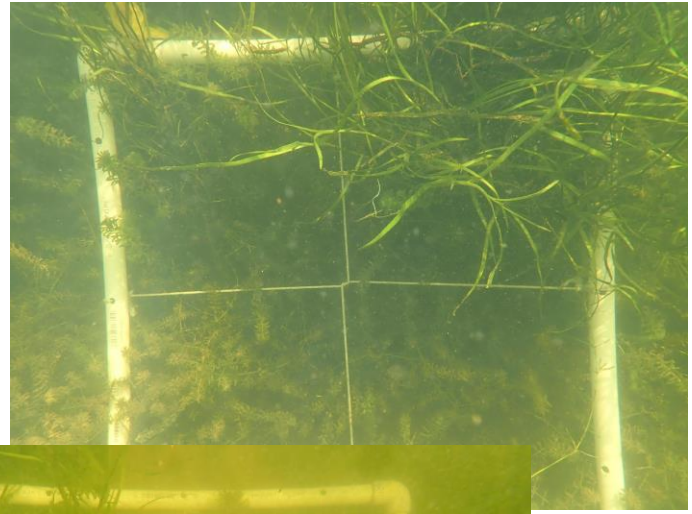
https://www.chesapeakebay.net/what/programs/monitoring/sav-monitoring-program/tier-iii-sav-sentinel-site-program

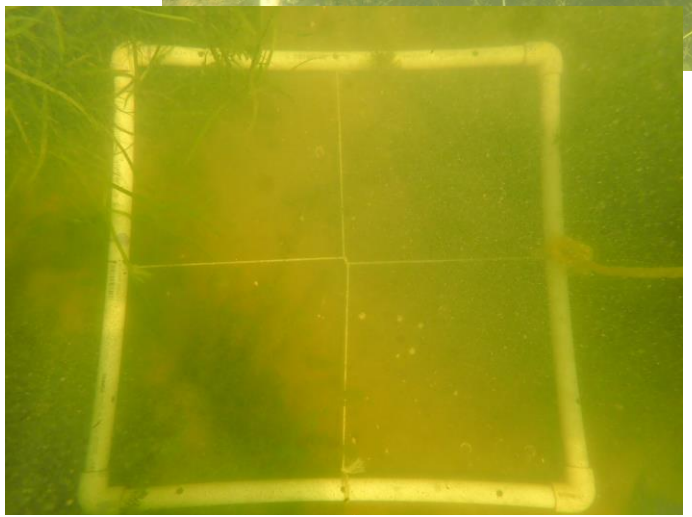
Tier 3

SAV Sentinel Site Program - Applications

Sentinel Sites are Useful for:

- Early Detection of Changes
- Monitoring Trends and Patterns
- Indicator of Ecosystem Health
- Research and Scientific Study
- Risk Assessment and Management
- Decision Support for Policy and Management
- Validation of Models
- Community Engagement and Education
- Adaptive Management





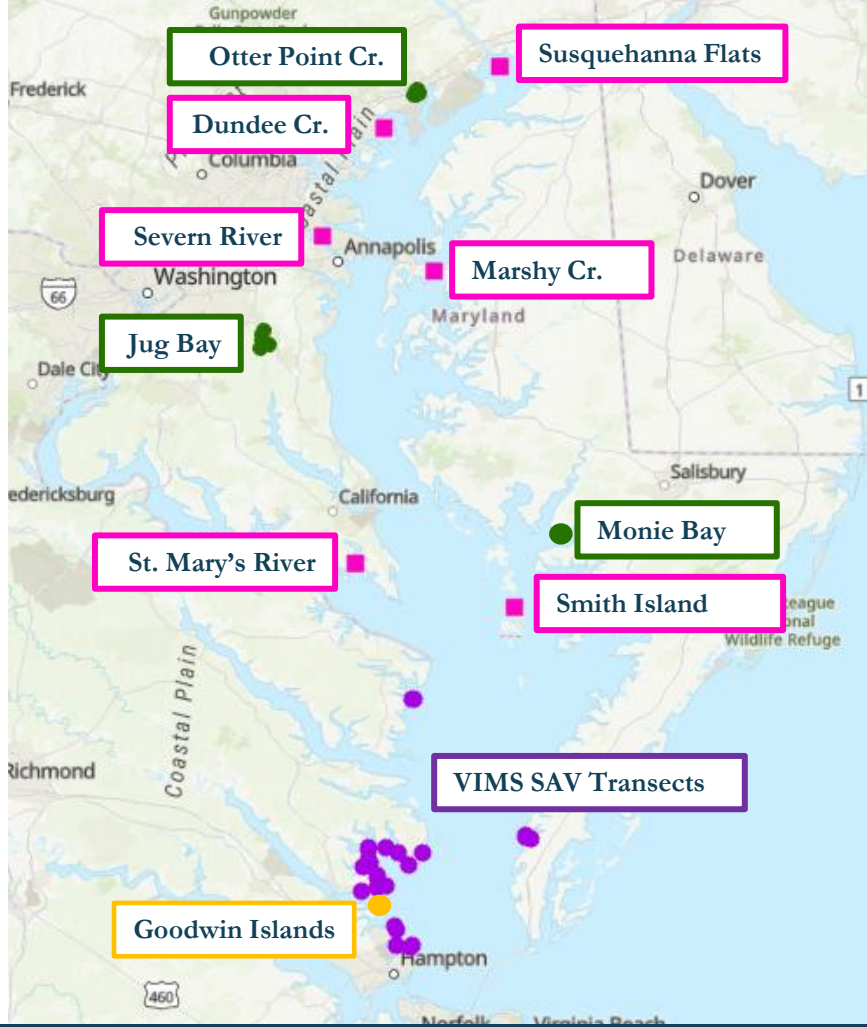
https://www.chesapeakebay.net/what/programs/monitoring/sav-monitoring-program/tier-iii-sav-sentinel-site-program

Tier 3

SAV Sentinel Site Program - Locations

SAV Sentinel Sites to be monitored in 2026:

- Maryland DNR and Partner Sites
- VIMS sites
- CB- NERR MD
- CB-NERR VA



https://www.chesapeakebay.net/what/programs/monitoring/sav-monitoring-program/tier-iii-sav-sentinel-site-program

Tier 3

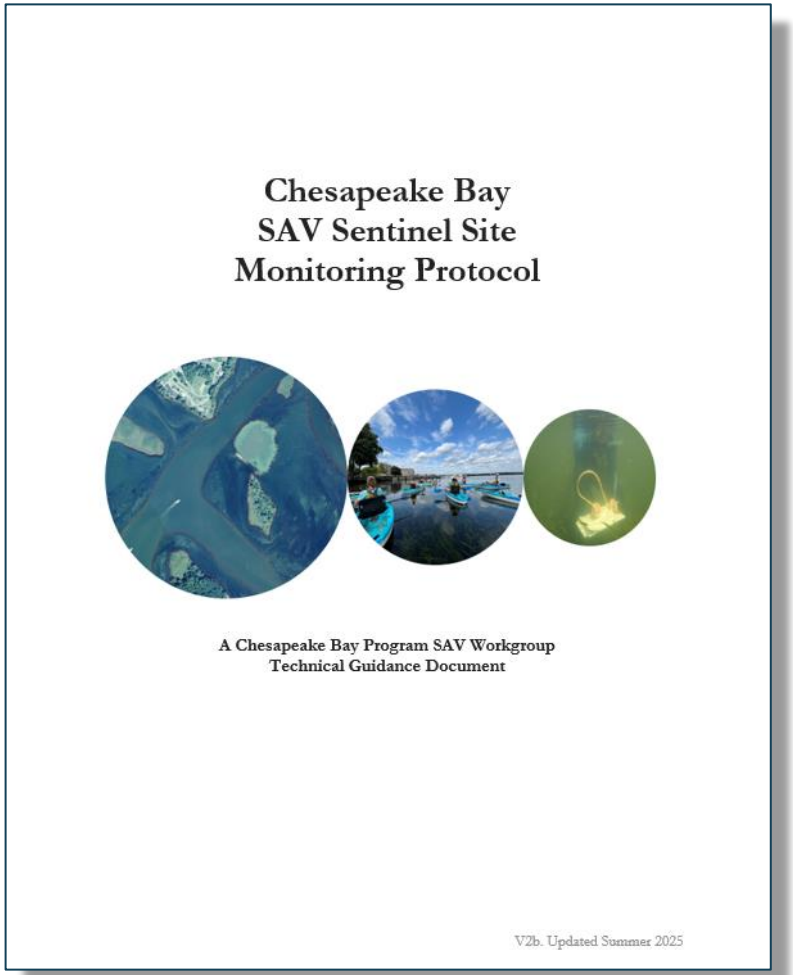
Chesapeake Bay SAV Sentinel Site Program – Parameters and Protocol

General Information:
- Date
- Time
- Site name
- Surveying organization
- Name of data collector(s)
- General site coordinates

Physical Parameters:
- Waypoint
- Water depth
- Sediment/substrate type
- Bottom disturbance

Water Quality:
- Secchi Depth
- Light Attenuation
- Salinity
- Temperature
- pH

Biological Parameters:
- Total SAV % cover, including macroalgae
- Cover of each species present, including macroalgae
- Canopy height
- Epiphyte loading
- Shoot density
- Presence/absence of reproductive structures
- Indications of disease/lesions
- Indications of herbivory



https://www.chesapeakebay.net/what/programs/monitoring/sav-monitoring-program/tier-iii-sav-sentinel-site-program

Tier 3

Chesapeake Bay SAV Sentinel Site Program – Monitoring Schedule

Survey Timeframe	Months	SAV Community Peak Biomass
Early-summer	May/June	Zostera/Zannichellia
Mid-summer	July	Mesohaline/estuarine SAV community
Late-summer	August/ September	Tidal Fresh/Oligohaline SAV community

Monitoring Schedule

At new or previously established SAV Sentinel Sites, survey three times during the growing season. Peak biomass varies depending on the salinity regime/SAV community at the SAV Sentinel Site. The following monitoring schedule ensures that a survey takes place during peak biomass of each of the Bay's SAV communities.

https://www.chesapeakebay.net/what/programs/monitoring/sav-monitoring-program/tier-iii-sav-sentinel-site-program

Questions?

Brooke.Landry@Maryland.Gov