



Chesapeake Bay Program



Chesapeake Bay Restoration

The Power of Watershed Partnerships

Gary Shenk

STAC Liaison

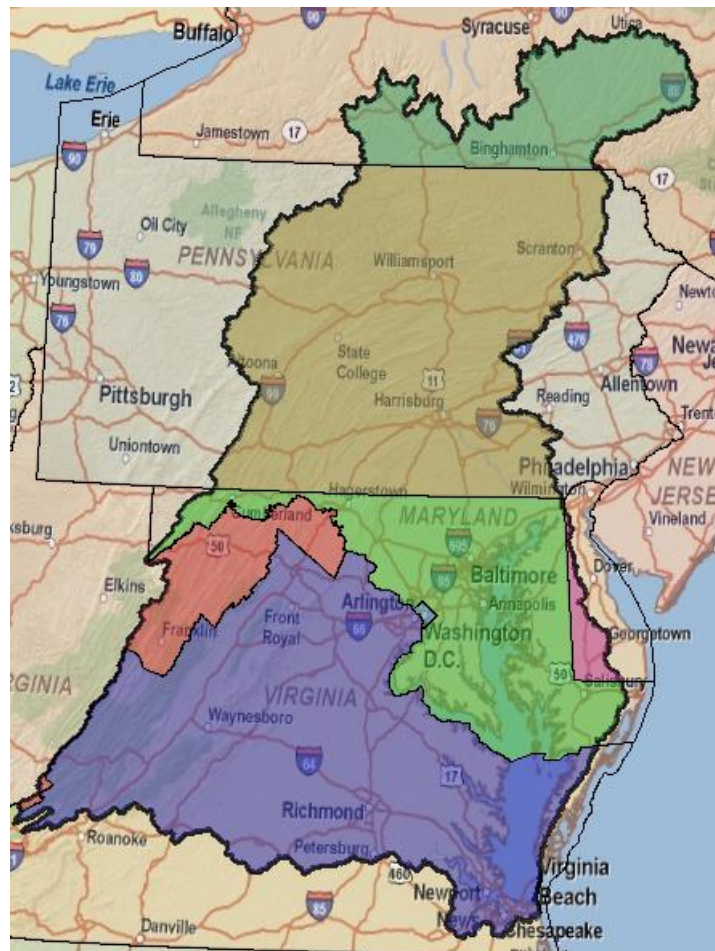
Chesapeake Bay Program Office

March 26, 2019



The Chesapeake Bay and Watershed

North America's Largest Estuary





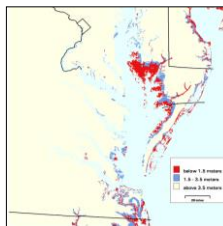
Bay Pressures

Land & People



- Population growth
- Development
- Impervious surfaces
- Stormwater

Climate Change



- Sea level rise
- Warmer water temperatures
- Fewer underwater grasses
- Larger dead zones
- Fewer wintering waterfowl

Air & Water Pollution



- Nitrogen and phosphorous
- Sediment
- Chemical contaminants

Invasive Species



- Nutria
- Phragmites
- Blue catfish

Fisheries



- Disease
- Overharvesting

Natural Factors



- High temperatures
- Strong storms
- Inconsistent freshwater flows



Chesapeake Bay



CHESAPEAKE BAY FOUNDATION

Saving a National Treasure



CHESAPEAKE WATERSHED AGREEMENT

1983



CHESAPEAKE WATERSHED AGREEMENT

1987



CHESAPEAKE WATERSHED AGREEMENT

2000



CHESAPEAKE

TMDL
2010



CHESAPEAKE WATERSHED AGREEMENT

2014



Chesapeake Bay Program
A Watershed Partnership

40% goal

TMDL
WQ goals

Accountability
And outcomes

1960s

1980s

2000s

1970s

1990s

2010s

4-employee office



\$73M Budget



Partner and Public Comments

Chesapeake Bay Program partners also gathered input from citizens, stakeholders, academic institutions, local governments and more to draft an inclusive, goal-oriented document that would address current and emerging environmental concerns.





Agreement signatories include representatives from the entire watershed, committing for the first time the Bay's headwater states to full partnership in the Chesapeake Bay Program.

Our Plan: Work toward 10 interrelated goals and 31 measurable, time-bound outcomes that will create a healthy watershed.



Sustainable Fisheries

Protect, restore and enhance finfish, shellfish and other living resources, their habitats and ecological relationships to sustain all fisheries and provide for a balanced ecosystem in the watershed and Bay.



Blue Crabs
Forage
Fish

Oysters
Fish Habitat



2014

Vital Habitats

Restore, enhance and protect a network of land and water habitats to support fish and wildlife and to afford other public benefits, including water quality, recreational uses and scenic value across the watershed.

Wetlands
Black Ducks
Fish Passage
Tree Canopy

Underwater Grasses
Stream Health
Brook Trout
Forest Buffers



2014

Water Quality

Reduce pollutants to achieve water quality necessary to support the aquatic living resources of the Bay and its tributaries and protect human health.



2014

2017 WIP & 2025 WIP
Water Quality Standards
Attainment & Monitoring

Toxic Contaminants

Ensure that the Bay and its rivers are free of effects of toxic contaminants on living resources and human health.



2014

Toxics Research
Policy & Prevention

Healthy Watersheds

Sustain state-identified healthy waters and watersheds, recognized for their high quality and/or high ecological value.



2014

Healthy Watersheds

Stewardship

Increase the number and diversity of local citizen stewards and local governments that actively support and carry out the conservation and restoration activities that achieve healthy streams, rivers and a vibrant Chesapeake Bay.

Image Chiot's Run/Flickr

Citizen Stewardship
Local Leadership
Diversity



2014

Land Conservation

Conserve landscapes treasured by citizens in order to maintain water quality and habitat; sustain working forests, farms and maritime communities; and conserve lands of cultural, indigenous and community value.

Protected Lands
Land Use Metrics & Methods
Land Use Evaluation



2014

Public Access

Expand public access to the Bay and its tributaries through existing and new local, state and federal parks, refuges, reserves, trails and partner sites.



2014

Public Access Site Development

Environmental Literacy

Enable students in the region to graduate with the knowledge and skills to act responsibly to protect and restore their local watershed.

Students
Sustainable Schools
Planning



2014

Climate Resiliency

Increase the resiliency of the Chesapeake Bay watershed, including its living resources, habitats, public infrastructure and communities, to withstand adverse impacts from changing environmental and climate conditions.



2014

Monitoring & Assessment
Adaptation

WATER QUALITY

Restoring the Bay's waters is critical to overall watershed restoration because clean water is the foundation for healthy fisheries, habitats and communities across the region. However excess amounts of nitrogen, phosphorus and sediment in the Bay and its tributaries have caused many sections of the Bay to be listed as "impaired" under the Clean Water Act. The Chesapeake Bay Total Maximum Daily Load (TMDL) is driving nutrient and sediment reductions as described in the Watershed Implementation Plans (WIPs), adopted by the states and the District of Columbia, and establishes the foundation for water quality improvements embodied in this Agreement. These plans set nutrient and sediment reduction targets for various sources—stormwater, agriculture, air deposition, wastewater and septic systems.



GOAL: Reduce pollutants to achieve the water quality necessary to support the aquatic living resources of the Bay and its tributaries and protect human health.

7

2017 Watershed
Implementation
Plans (WIP) Outcome



By 2017, have practices and controls in place that are expected to achieve 60 percent of the nutrient and sediment pollution load reductions necessary to achieve applicable water quality standards compared to 2009 levels.

2025 WIP
Outcome



By 2025, have all practices and controls installed to achieve the Bay's dissolved oxygen, water clarity/submerged aquatic vegetation and chlorophyll a standards as articulated in the Chesapeake Bay TMDL document.

Water Quality
Standards
Attainment and
Monitoring Outcome



Continually improve the capacity to monitor and assess the effects of management actions being undertaken to implement the Bay TMDL and improve water quality. Use the monitoring results to report annually to the public on progress made in attaining established Bay water quality standards and trends in reducing nutrients and sediment in the watershed.

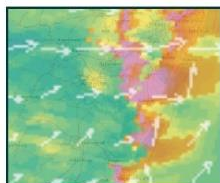


Data and Model Inputs

- Pollution Control Data
- Land Use Data
- Point Sources Data
- Septic Data
- U.S. Census Data
- Agricultural Data



Land Use Change Model



Airshed Model

- Precipitation Data
- Meteorological Data
- Elevation Data
- Soil Data

Phase 6 Watershed Model/CAST

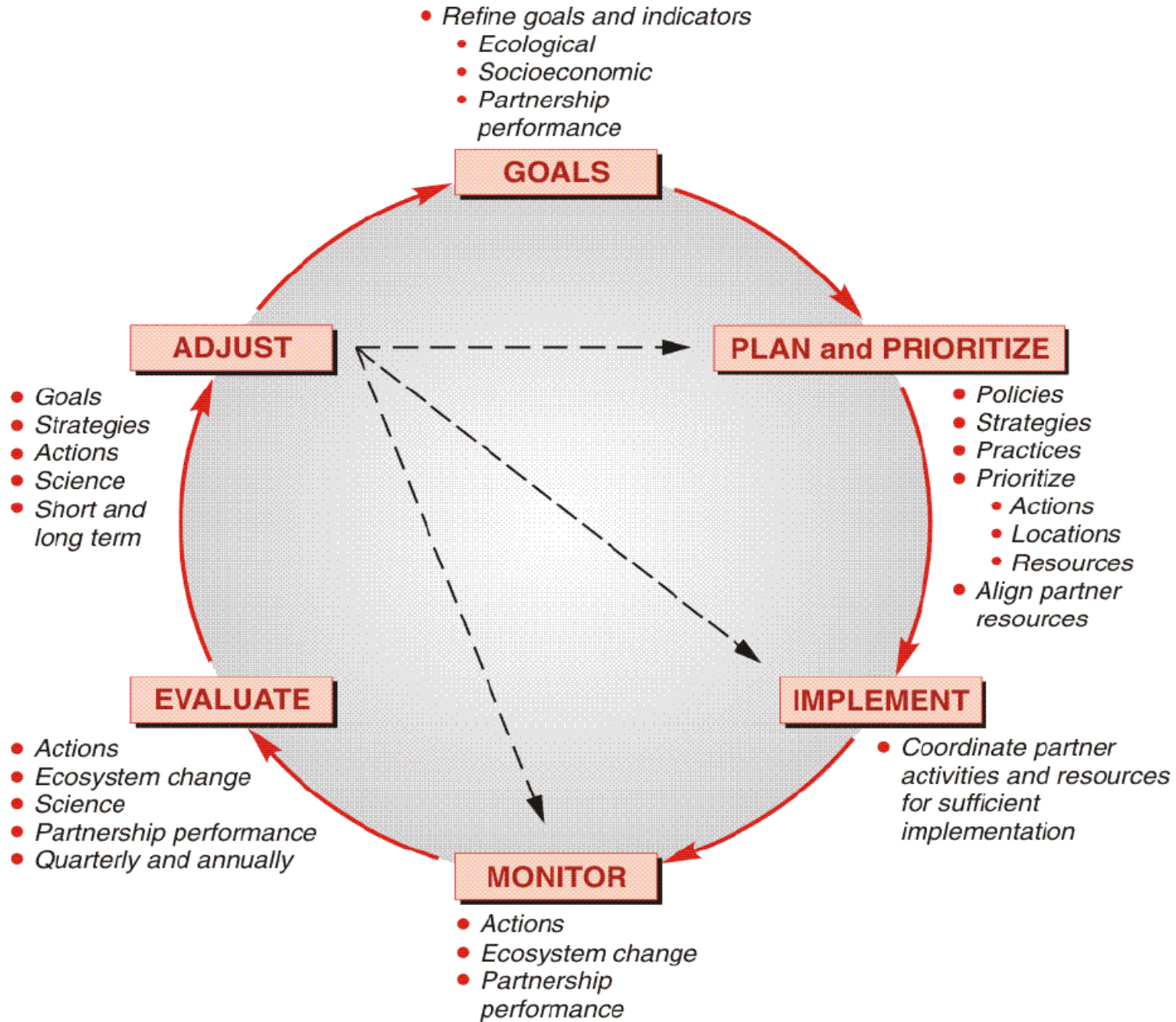


Estuary Model



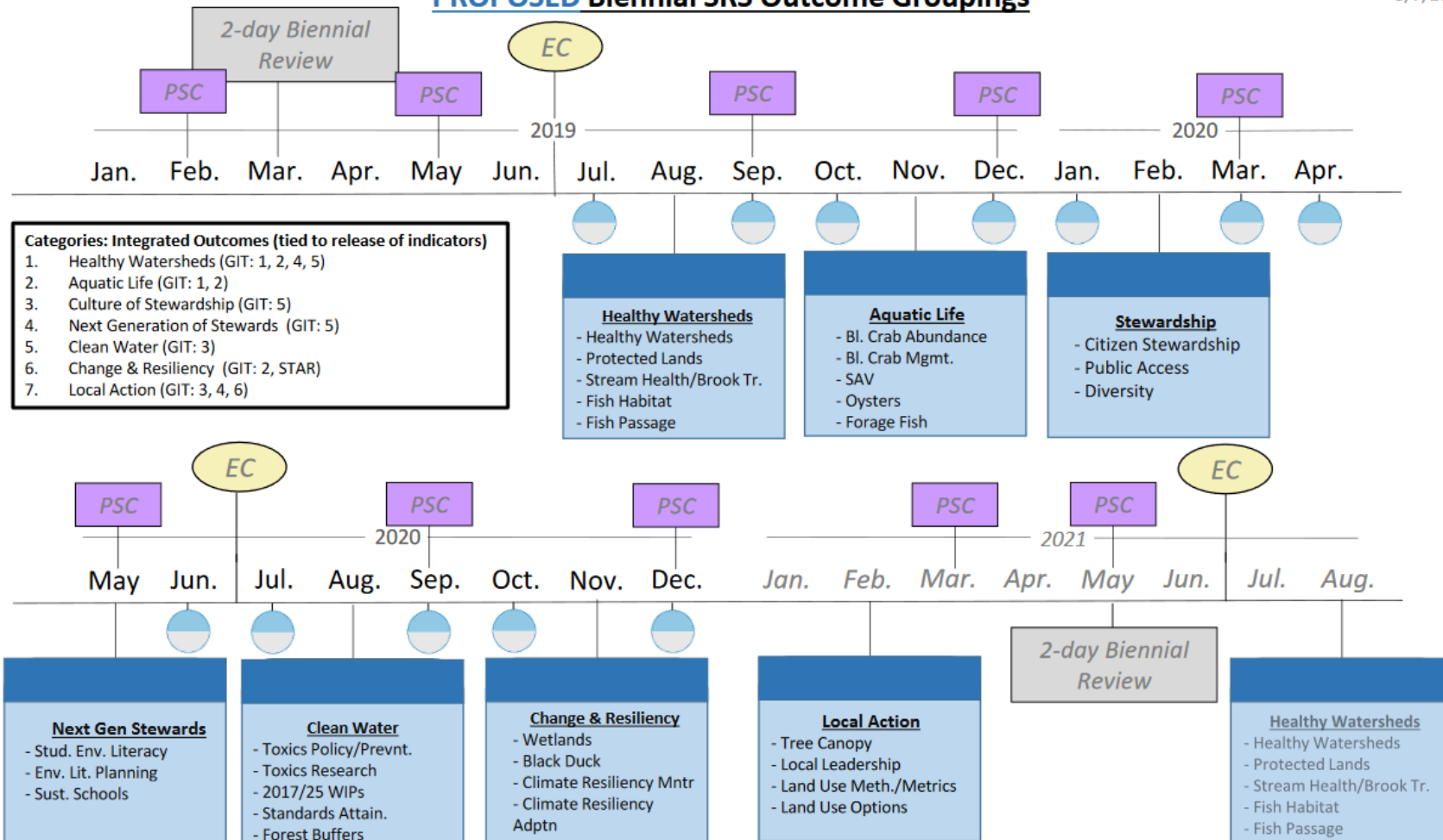
Dissolved Oxygen

TMDL analysis tools and related data collection
Account for about $\frac{3}{4}$ of STAC effort in the past decade



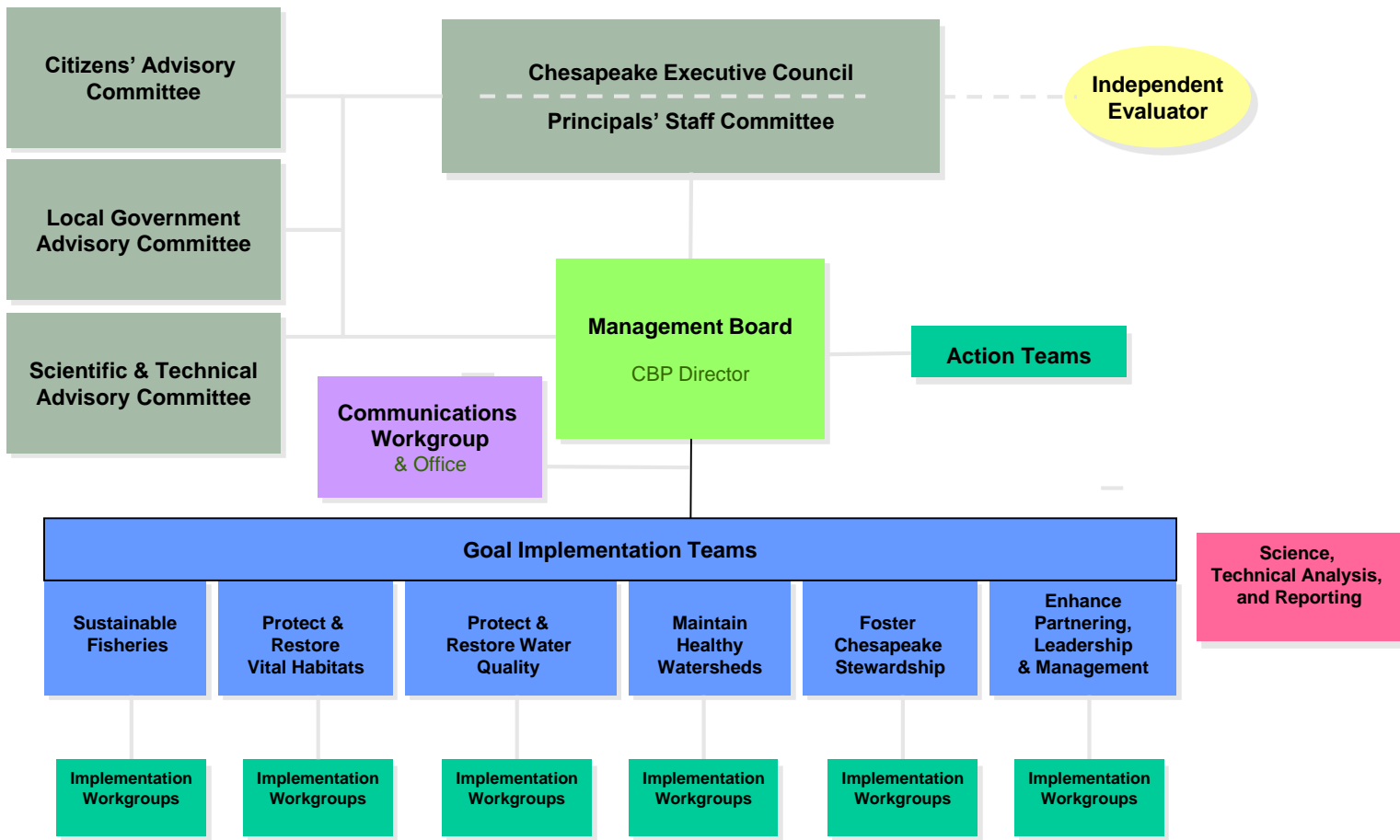


PROPOSED Biennial SRS Outcome Groupings





CBP Organizational Structure and





GIT Leadership Profile (2-26-19)

GIT	Chairs	Vice-Chairs	Coordinators	Staffers
1-Sustainable Fisheries	NOAA	VA (Marine Resources Commission)	NOAA	CRC
2-Protect and Restore Vital Habitats	MD(DNR)	VA (Department of Game and Inland Fisheries)	USFWS	CRC
3-Protect and Restore Water Quality	VA (DEQ) MDE	WVDEP	EPA	CRC
4-Maintain Healthy Watersheds	MDE	MD (DNR)	USGS	CRC
5-Foster Stewardship	NPS	EPA	NPS	CRC
6-Enhance Partg, Leadership, & Mgmt	MD (DNR)	EPA	EPA	CRC
STAR	Academic (UMD)	USGS	EPA	CRC
Communications	EPA	MD (MDE)	NGO (ACB)	CRC
Summary	<i>Total:</i>	<i>Total:</i>	<i>Total:</i>	<i>Total:</i>
	2 Fed	3 Fed	7 Fed	0 Fed
	5 State	5 State	0 State	0 State
	0 NGO	0 NGO	1 NGO	8 NGO-Grantee
	1 Academic	0 Academic	0 Academic	0 Academic



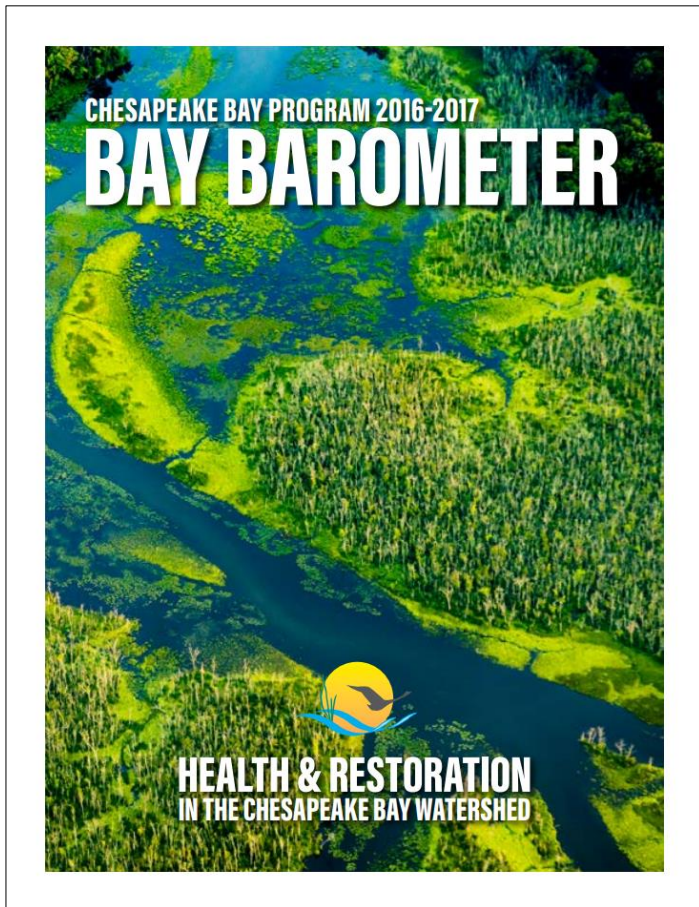
- The CBP is a partnership
 - Federal agencies
 - State agencies
 - Local governments
 - Non-profit organizations
 - Academic institutions





Academic Institutions

- Participate in committees
- Paid on-site researchers
- Guest Grad Students
- Letters of Recommendation
- Collaborative Projects



How is the Bay doing?

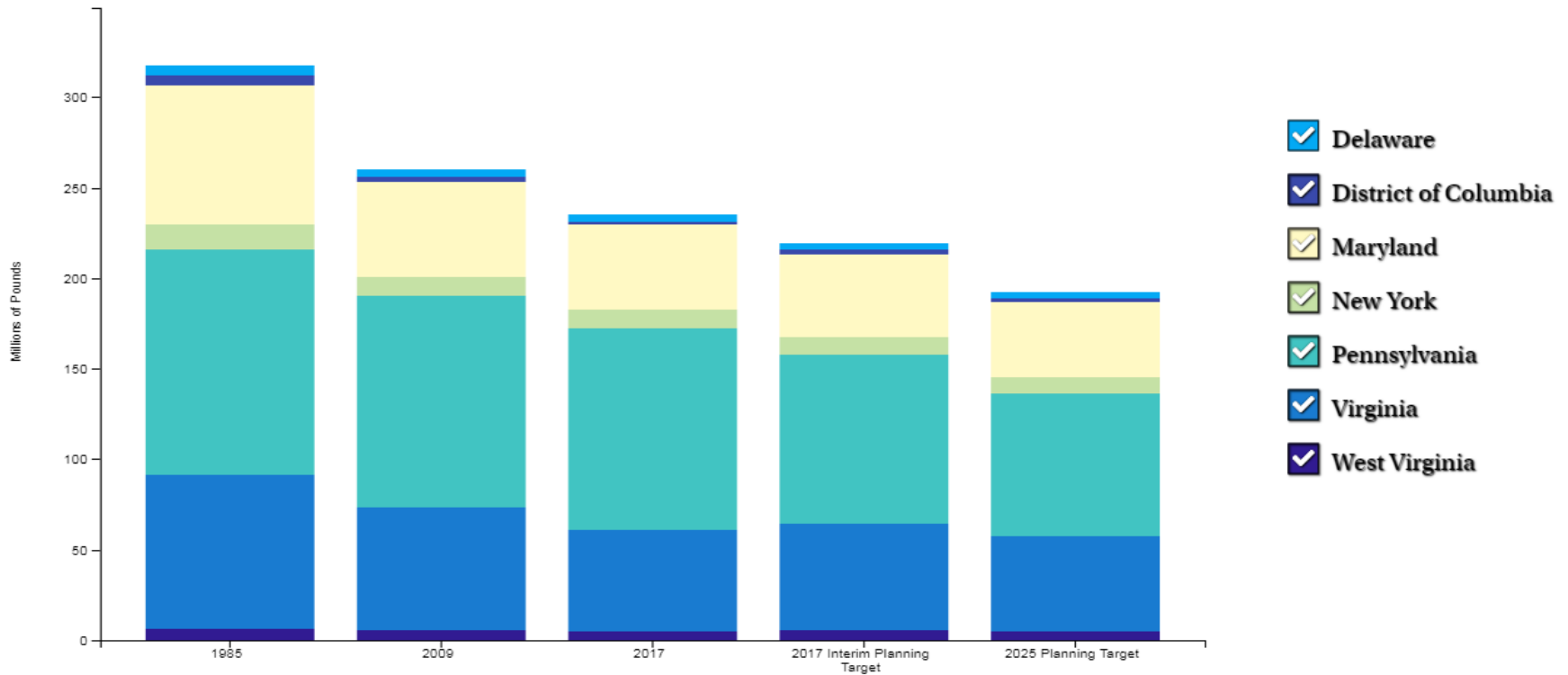
The latest science from 2016 & 2017



Reducing Nitrogen

Modeled Nitrogen Loads to the Chesapeake Bay (1985-2025)

Loads simulated using Watershed Model (Phase 5.3.2) and jurisdiction-reported data on wastewater discharges.

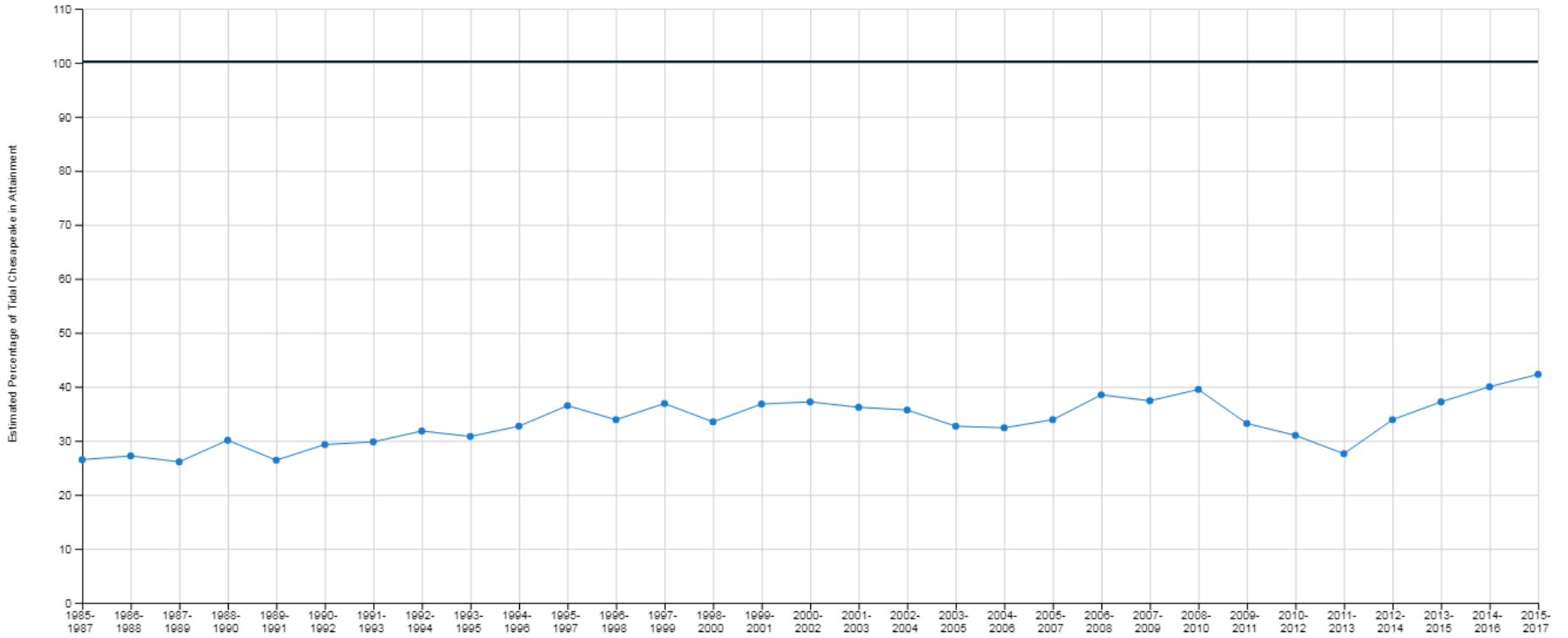




Tidal Water Quality

Water Quality Standards Attainment (1985-2017)

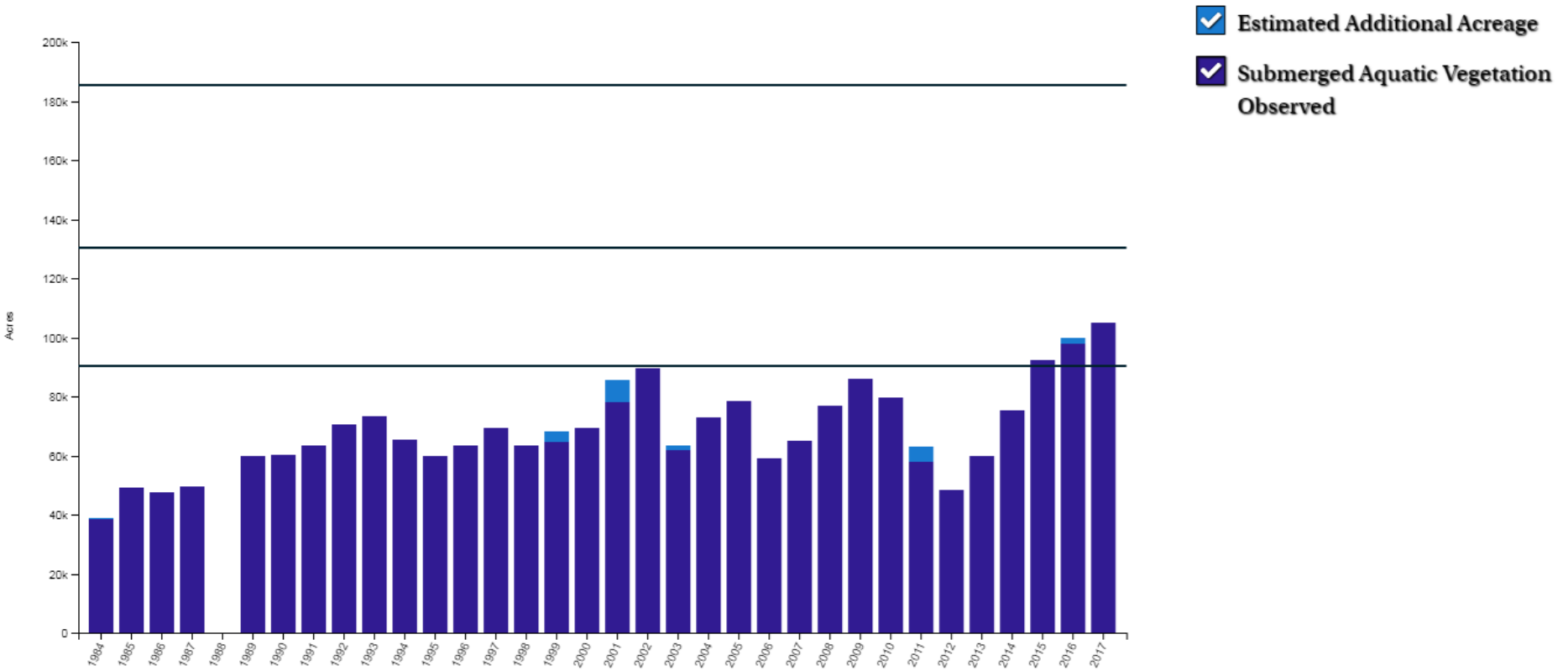
Water quality is evaluated using three parameters: dissolved oxygen, water clarity or underwater grass abundance, and chlorophyll a (a measure of algae growth).

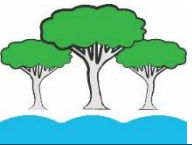




Underwater Grasses Abundance

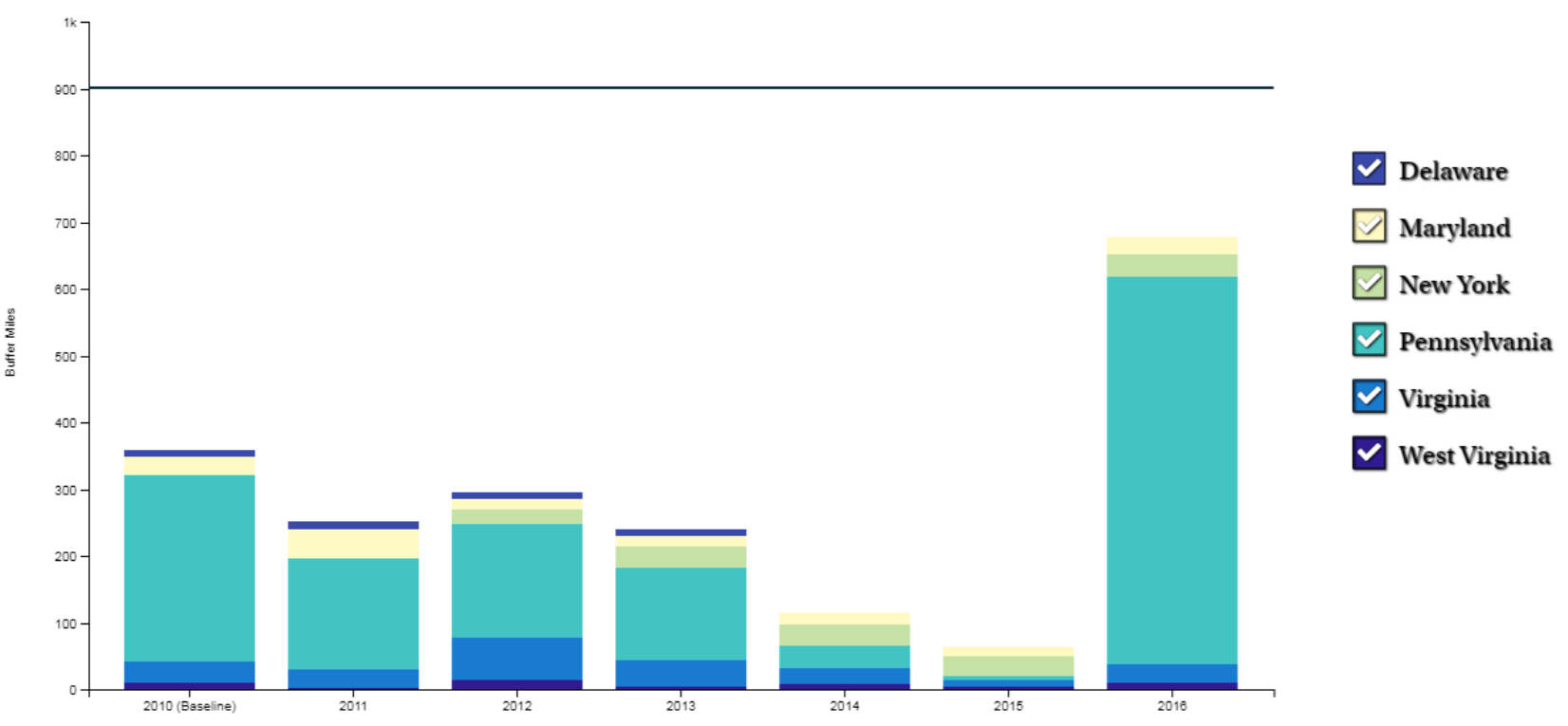
Submerged Aquatic Vegetation (SAV) Abundance (1984-2017)





Forest Buffers

Forest Buffers Planted (2010-2016)

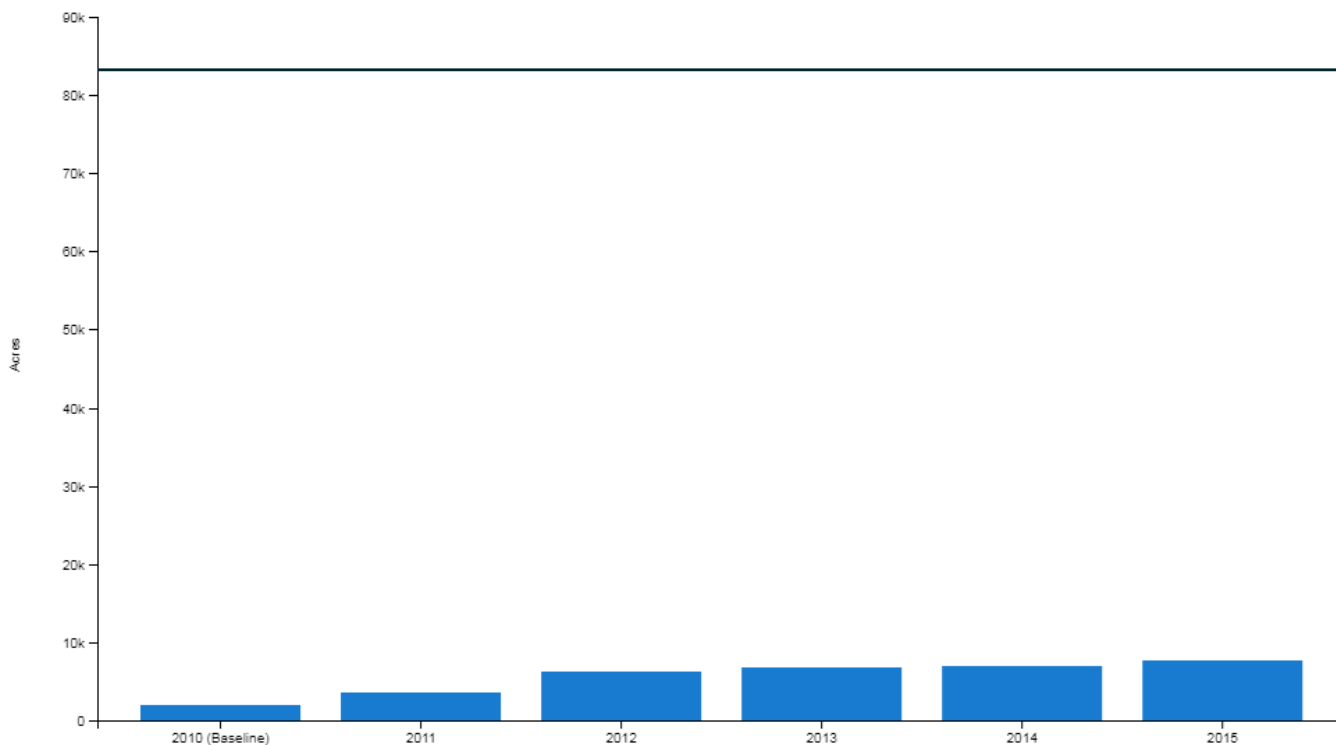


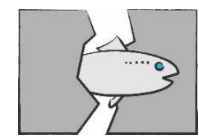


Wetlands

Wetlands Restored on Agricultural Lands (Cumulative) (2010-2015)

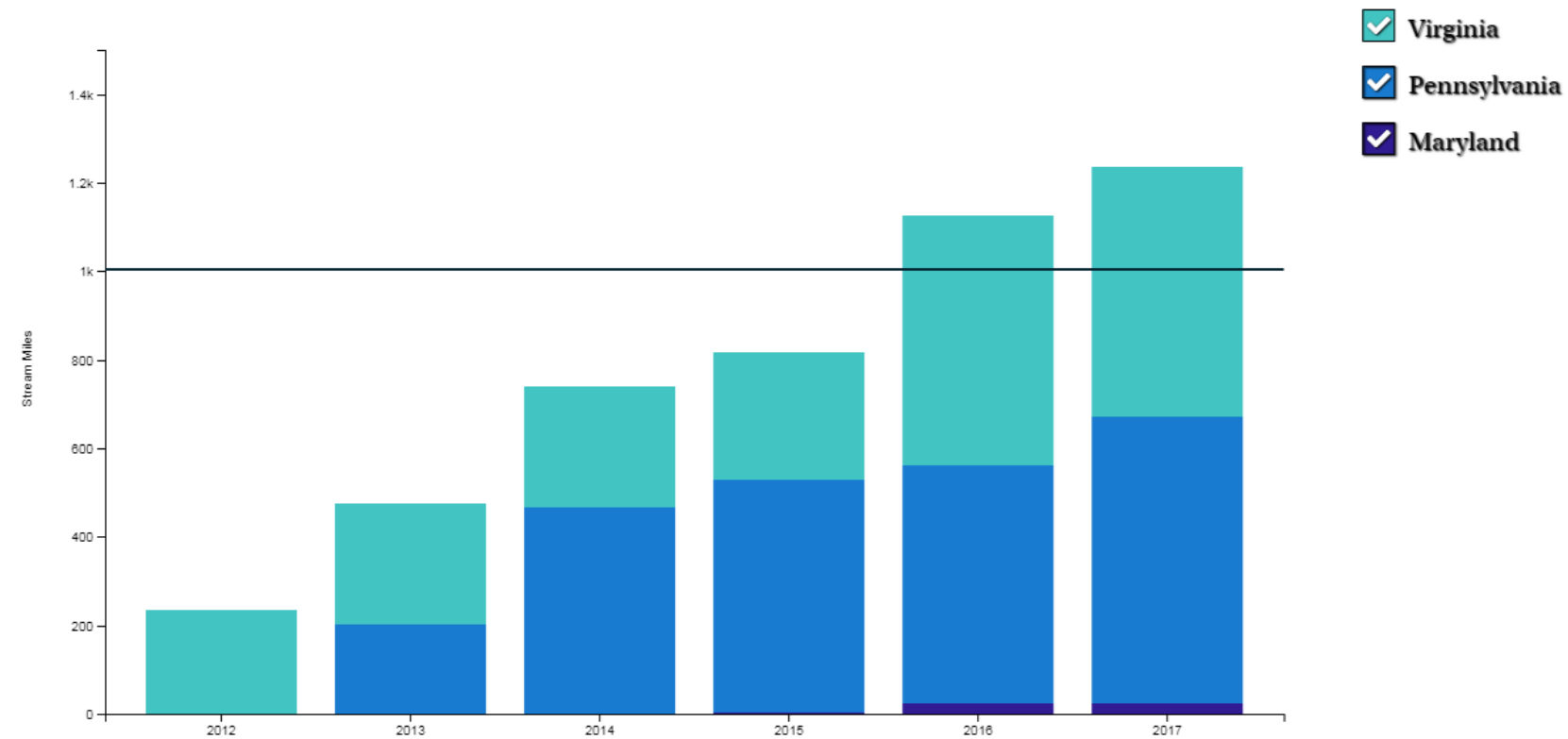
■ Wetlands Restored





Fish Passage

Stream Miles Opened to Fish Passage (Cumulative) (2012-2017)

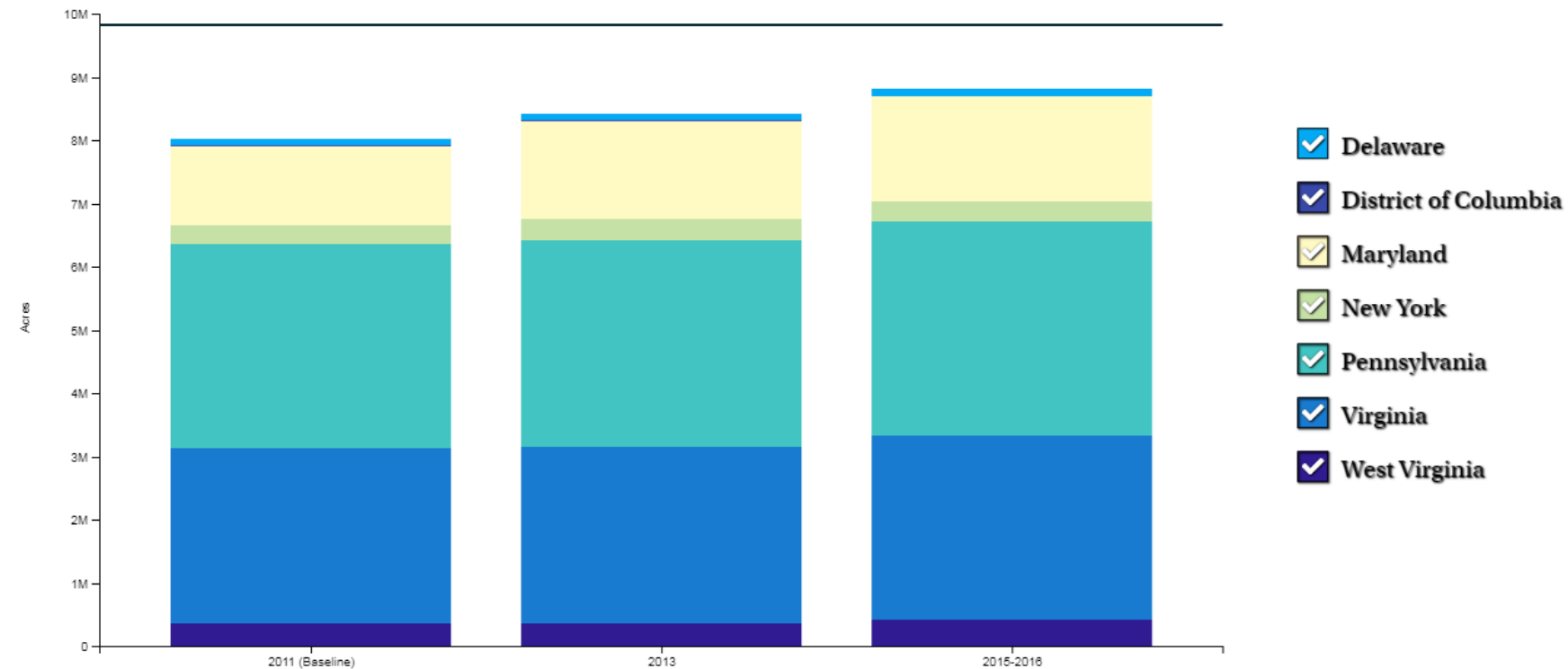




Protected Lands

Protected Lands (Cumulative) (2011-2016)

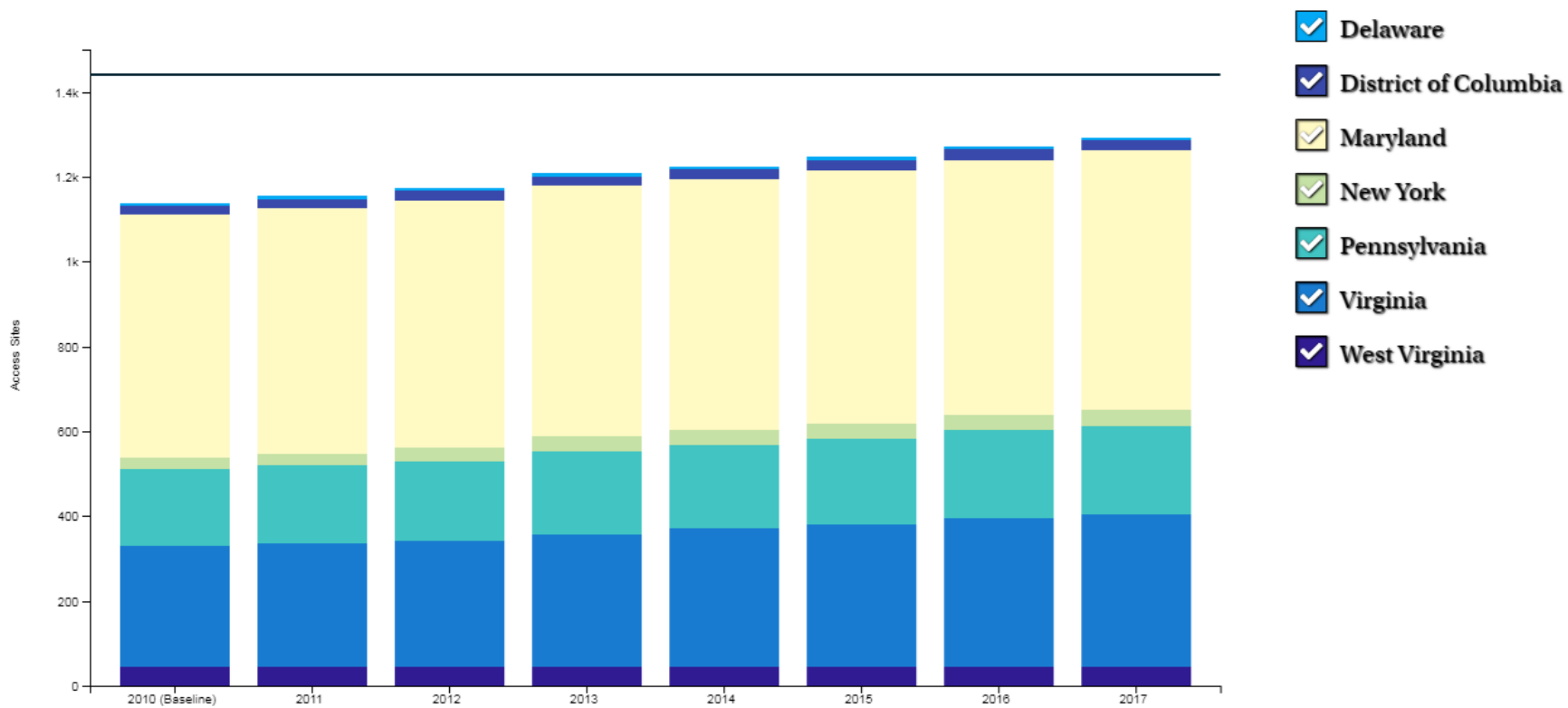
Some increases in acreage can be attributed to newly protected parcels of land. Other increases can be attributed to the addition of previously protected but newly digitized, corrected or refined parcels.





Public Access

Public Access Sites in the Chesapeake Bay Watershed (Cumulative) (2010-2017)



Thank you!

Credits:
Chesapeake Bay
Program Office
and 100s of
Chesapeake Bay
Program
partners



STAC Overview



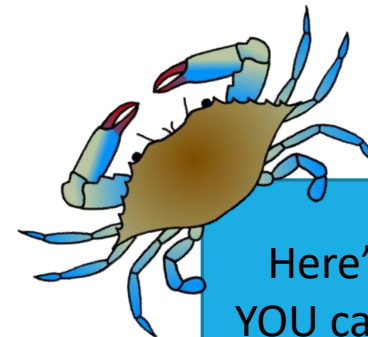
RACHEL DIXON

ANNABELLE HARVEY

MARCH 26, 2019

Outline

- STAC – Who we Are
 - Where does STAC fit in to the Chesapeake Bay Program?
 - What are STAC's roles?
 - Proactive vs. Responsive
- STAC – What we Do
 - Quarterly Meetings
 - Workshops
 - Reviews
 - Brief overview of STAC's Budget
- Looking Ahead
 - Upcoming Activities
 - Opportunities for involvement



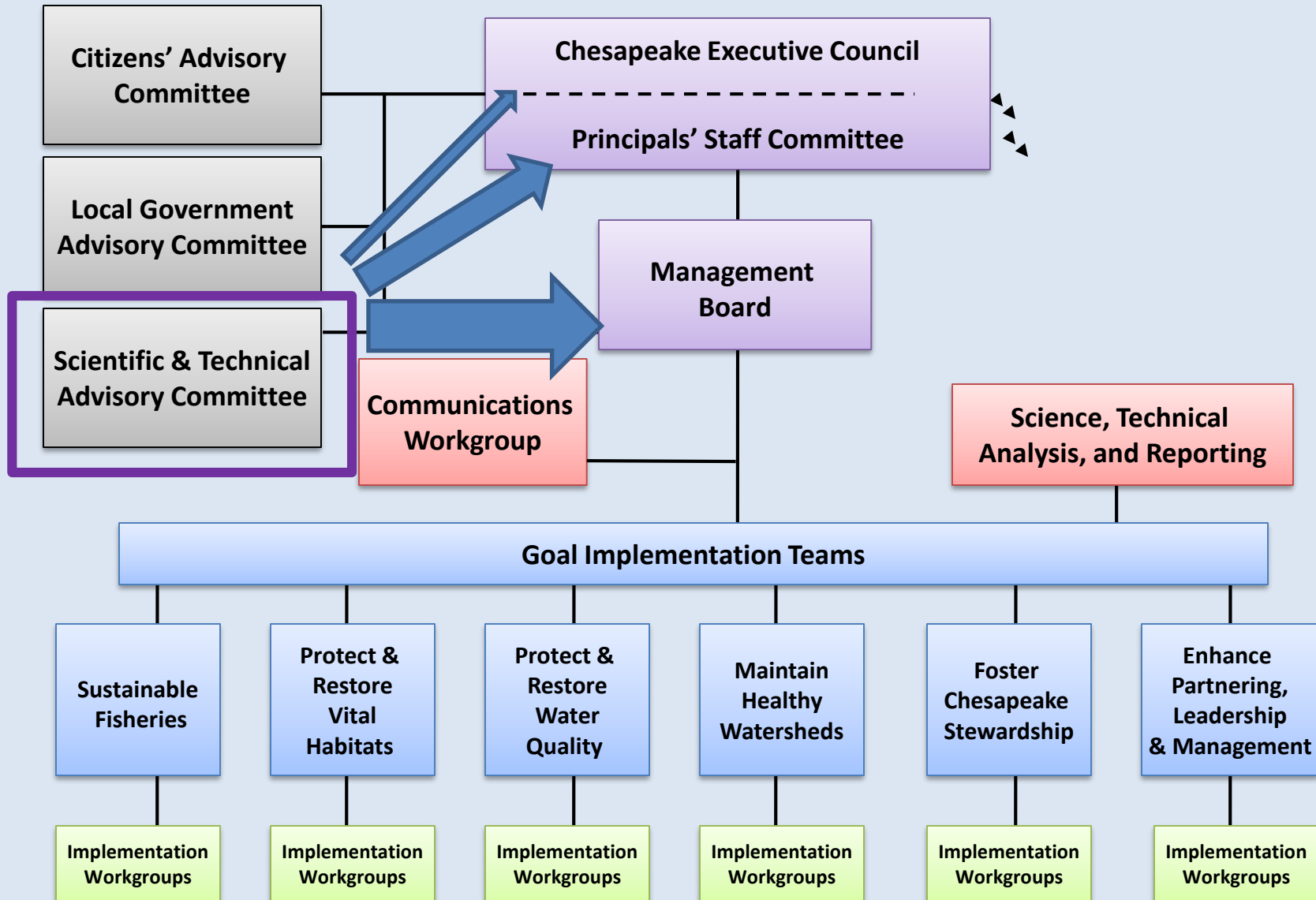
Here's where
YOU can plug in!

STAC - Who we Are

Mission Statement: The Scientific and Technical Advisory Committee (STAC) provides scientific and technical advice and guidance to the Chesapeake Bay Program (CBP) Partnership on measures to restore and protect the Chesapeake Bay and its watershed.

Long Version: Since its creation in December 1984, STAC has worked to enhance scientific communication and outreach throughout the Chesapeake Bay watershed and beyond. STAC provides independent scientific and technical advice in various ways, such as (1) technical reports and white papers, (2) conducting reviews of CBP products, (3) technical workshops, and (4) interaction between STAC members and the CBP. STAC serves as a liaison between the scientific community and the CBP. Through professional and academic contacts and organizational networks of its members, STAC ensures close cooperation among and between the various research institutions and management agencies represented in the Chesapeake Bay watershed

Chesapeake Bay Program Organizational Structure



CHESAPEAKE SCIENCE SUPPORT

GOAL IMPLEMENTATION TEAMS

FISHERIES

HABITAT

WATER
QUALITY

HEALTHY
WATERSHEDS

STEWARDSHIP

LEADERSHIP

Science Collaboration

- MONITORING
- DATA INTEGRITY
- STATUS AND TRENDS
- EXPLAIN AND PREDICT CHANGE
- MODELING
- CLIMATE CHANGE
- INFORMATION AND GIS SUPPORT
- SYNTHESIZE AND INFORM

CBP OFFICE

FEDERAL

STATE

LOCAL

ACADEMIC

NGO

S
T
A
C

STAR vs. STAC

STAR



STAR is your on-the-ground, everyday technical assistance.

STAC



STAC is your avenue for evaluating broader questions.

Indicators: A summary measure that provides information on the state of, or change in, the system that is being measured.



STAR and STAC Support of Goal Teams

What is your role as a STAC member?

Provide expert opinion to the Chesapeake Bay Program (CBP) partners on any issue identified as important by the science community as well as management leadership. STAC acts to raise and review issues that members deem crucial to Chesapeake Bay restoration (**proactive**) or in providing scientific opinion when CBP partners solicit specific reviews or technical assistance (**responsive**).

- Connecting your network – Representing your own and your colleagues expertise
- Contribute to STAC-sponsored activities
- Serve as liaison between STAC and other CBP entities (GITs, workgroups)

Are you a Gubernatorial or Federal Appointee?

Each appointed mayoral or gubernatorial and federal representative from a **jurisdiction serves as the continuous communication link between STAC and his/her member of the Management Board (MB), Principal's Staff Committee (PSC) and/or the Executive Council (EC)**

Mayoral or gubernatorial appointees assist STAC by **maintaining active communication with the Chief Executive or staff in his/her jurisdiction or agency** to ensure transfer of relevant STAC information and recommendations to the executive branch of the jurisdiction, as well as relaying issues of jurisdictional concern to the STAC

Who are my representatives in the CBP? Go to:
https://www.chesapeakebay.net/who/how_we_are_organized

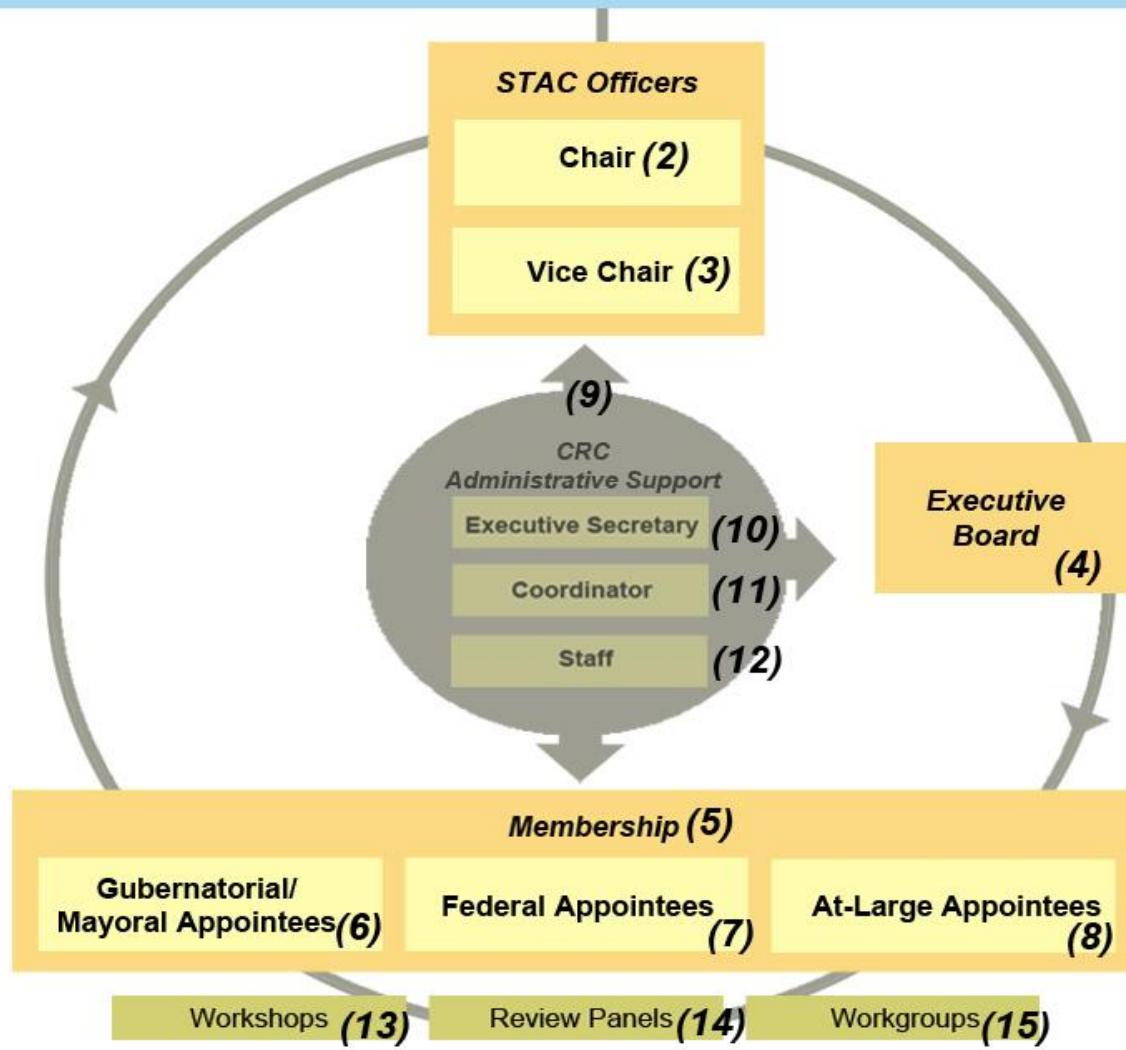
The CBP's connection to the regional and national scientific community



Distribution of STAC Member Affiliations

Affiliation	Number of STAC Members
VT	6
UMCES	4
USGS	3
VIMS	2
UMD	2
PSU	2
USDA	2
UMBC	2
WVU	2
EPA	1
UMES	1
MSU	1
Longwood U	1
Del Dept of Ag	1
NOAA	1
nspiregreen	1
HRSD	1
DOEE	1
Binghamton U	1
Ellen Gillinsky, LLC	1
Cornell	1
Nature Conservancy	1
TOTAL	38

Chesapeake Bay Program (1)



What we Do

Workshops

- Explore scientific topics of interest – state of the science, problem-solving, foster collaboration

Reviews

- Independently evaluate projects, policies and programs

Synthesis*

- Analysis or synthesis of available data and previously published results to address gaps and inform future research



STAC Budget Overview

The CBP provides STAC funding through a cooperative agreement with the Chesapeake Research Consortium (CRC)

- Includes support for Staff, STAC member travel, and funding for STAC Meetings, Workshops, Reviews, Syntheses, etc.

STAC receives our budget annually: Budget cycle runs June 1 - May 31



STAC Activities at a Glance

FY15

- 7 workshops
- 2 reviews

FY16

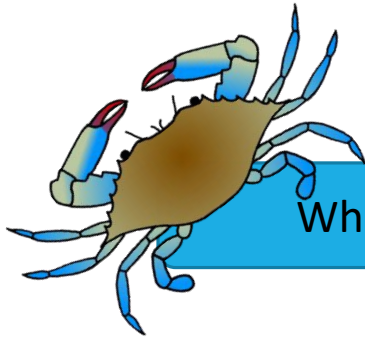
- 4 workshops
- 9 reviews

FY17

- 6 workshops

FY18

- 5 workshops



Where can STAC members weigh in?

Review proposals
for activities
(workshops and
reviews)



Serve on a review
panel or workshop
steering
committee



Review and
comment on final
reports

Quarterly Meetings

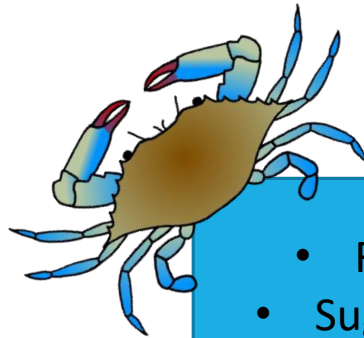
March, June, September, December

- Dates are set each September for the coming calendar year
- Typically Tuesday-Wednesday
- Meeting duration may vary; may have webinar meetings

STAC members expected to attend at least 2 meetings per year

- Call-in option will always be available

All meetings are open to the public – bring your colleagues!



- Recommend speakers or presentation topics
- Suggest venues, or host at your home institution

Structuring STAC Meetings

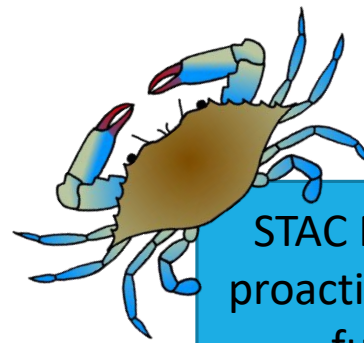
Meeting Content

- Mix of CBP programmatic updates and focusing on emerging science
- Integrated presentations with group discussion and feedback
- Concrete goals to come out of each meeting – ‘Action Item Trackers’
- Continuing the conversation and linking back to GITs and workgroups

Previous Meeting Themes

- High Priority Science Needs with the CBP; Climate Change
- “Humans Influencing Habitat”
- Using Decision Science: Prioritizing Efforts and Cross GIT Collaboration
- Water quality trends and implications for aquatic life and management
- Toxics; Strategic Scientific Planning and identifying Research priorities

Workshops



STAC Member(s) can submit a proactive workshop proposal for funding consideration

- ❑ Workshops are the most common STAC activity. STAC funds about 4 to 6 workshops each year.
- ❑ Workshops are opportunities for GITs, workgroups, advisory committees and other partners to investigate the science surrounding a topic related to restoration or conservation.
- ❑ A primary mechanism by which STAC brings the broad expertise of the scientific and technical community to bear on critical and timely issues
- ❑ STAC issues a Request for Proposals (RFP) each December, STAC members evaluate proposals, and determine funding at the March quarterly meeting

Reviews

- ❑ Requests for STAC reviews may be received at any time
- ❑ STAC conducts independent peer review of technical reports, policy statements, and activities on behalf of CBP or other partners.
- ❑ STAC usually emphasize reviews at the broad program level and development of advice on major issues.
- ❑ If funded, STAC convenes a review panel of qualified experts, from within STAC membership and outside institutions.

STAC-Sponsored Science Synthesis

- ❑ RFP currently open – deadline May 10, 2019
- ❑ Seeking proposals to conduct a synthesis related to how climate change may impact ongoing efforts to restore and protect the Bay
- ❑ Analysis and synthesis of available data and published results to identify and characterize knowledge gaps and inform future research
- ❑ Must also address uncertainties related to decision-making under climate change

Recommendations Database

STAC

Login

Categories

- ▶ Vital Habitats
- ▶ Sustainable Fisheries
- ▶ Water Quality
- ▶ Toxic Contaminants
- ▶ Healthy Watersheds
 - Land Conservation
- ▶ Stewardship
- ▶ Climate Change and Resiliency
- ▶ Social, Political, and Economic Scie
- ▶ Strategic Planning and Funding
 - Modeling

Clear All

Recommendations

Search :

Abbreviated Recommend...	Publication	Author	Actions
	Opportunities for Enhancing Agricultural Conservation Conference Report	Doug Beagle, Jim Baird, Jim Pease, Mark Dubin, Tom Basden	Detail Publication Response Letter STAC Letter
	Developing a Protocol for Development and Review of Reduction Efficiencies for Best Management Practices: Test Case of Pasture Management	Elizabeth Van Dolah, Elmer Dengler, Mark Dubin, Victoria Kilbert, William Keeling	Detail Publication Response Letter STAC Letter
The SAV model has been significantly improved and is continuing to show promise. For example, it pre	Tidal Sediments Workshop Report	Carl Cerco, Carl Friedrichs, Chris Spaur, Chuck Gallegos, Courtney Harris, Evamaria Koch, Jeff Halka, Julia Herman, Larry Sanford, Lee Currey, Lee Karrh, Lew Linker, Michael Kemp, Nancy Rybicki, Peter Bergstrom, Peter Tango, Scott Hardaway, Steve Bieber	Detail Publication Response Letter STAC Letter
Attempting to reduce nearshore turbidity through blanket application of shore protection measures wo	Tidal Sediments Workshop Report	Carl Cerco, Carl Friedrichs, Chris Spaur, Chuck Gallegos, Courtney Harris, Evamaria Koch, Jeff Halka, Julia Herman, Larry Sanford, Lee Currey, Lee Karrh, Lew Linker, Michael Kemp, Nancy Rybicki, Peter Bergstrom, Peter Tango, Scott Hardaway, Steve Bieber	Detail Publication Response Letter STAC Letter

Other Opportunities for Involvement

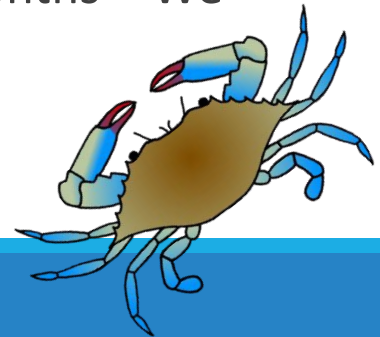
❖ Recommendation Database Focus Group

- Seeking Interested STAC Members for a 1 day in-person meeting (Annapolis) between March and June 2019
- Beta-testing database for structure and usability

❖ STAC website overhaul

- ❖ Staff are pursuing a potential opportunity to revise and update STAC's website. If you are interested in providing input, let us know!

- ❖ 8 workshop reports to be released over the next several months – We will need STAC members to review!



Current STAC Subcommittees

Science Synthesis – Tasked with outlining the operating procedures and mechanisms of both the ongoing climate change pilot effort, as well as future science synthesis activities. Will be conducting initial review of proposals received.

Input to the CBP's Strategic Science and Research Framework – Tasked with providing regular input on behalf of STAC to STAR and the CBP during the development of the science framework.

Interested in joining either one? Contact STAC Staff

We're Here for YOU!



William Ball

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Rachel Dixon

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Annabelle Harvey

harveya@chesapeake.org

For more information on STAC, and for Information regarding workshops, reviews, and upcoming meetings (including reports, as available), visit our webpage at:

<http://www.chesapeake.org/stac/>

Chesapeake Bay Program Website:

<https://www.chesapeakebay.net/>

CBP Newsletters (Daily, Weekly, Monthly)

<https://www.chesapeakebay.net/action/newsletters>