

Management Strategies

Chesapeake Bay Watershed Agreement

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March 20, 2015



Adaptive Management

One thing is sure.

We have to do something.

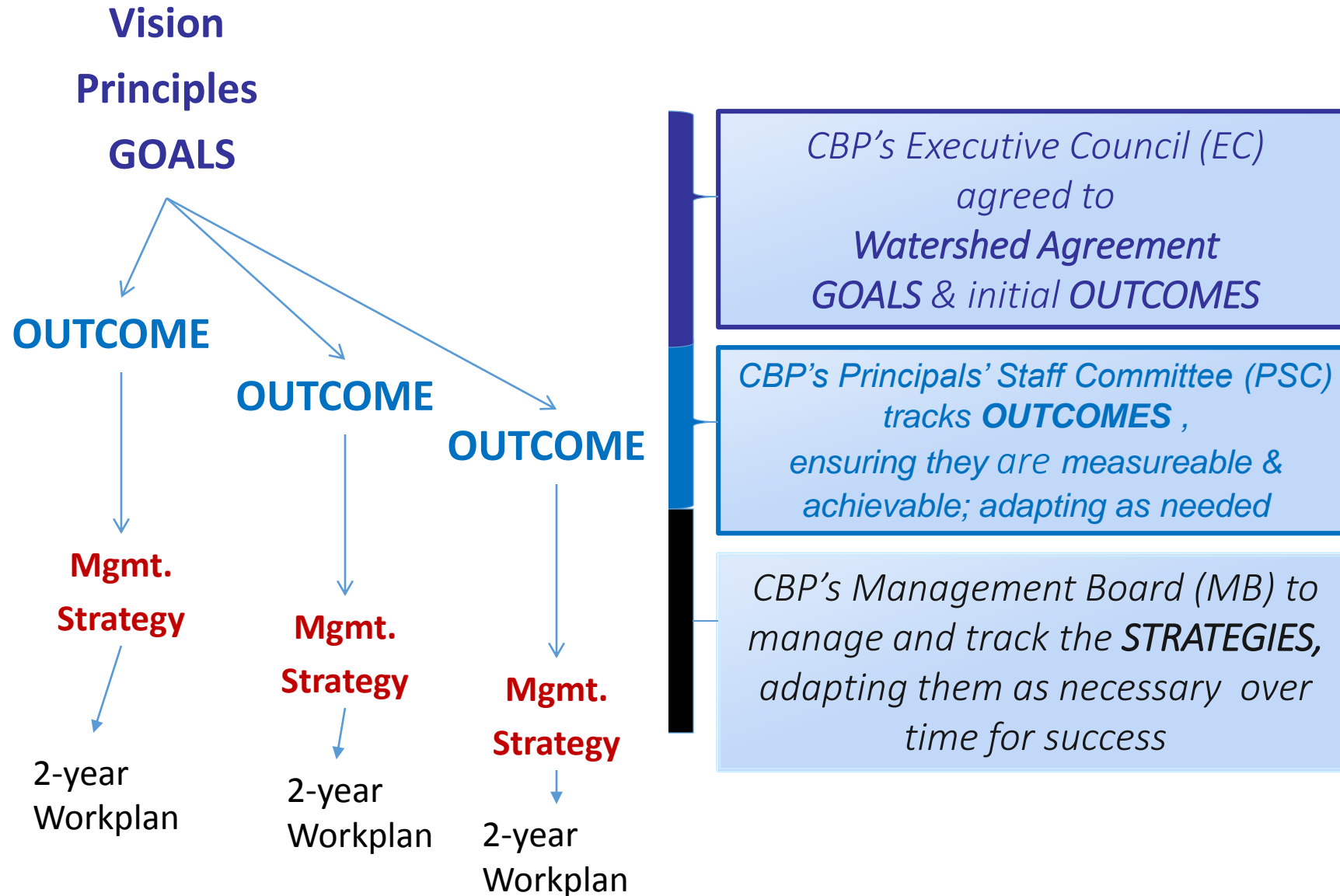
We have to do the best we know how at the moment...

If it doesn't turn out right, we can modify it as we go along

Franklin D. Roosevelt

32nd President of the United States

How partners are working. . .





What is a Management Strategy?

Management strategy –

A single document that summarizes the Partnership's management process and the collective thinking for each outcome or related group of outcomes.

Key Elements of Management Strategies

1. Executive Summary
2. Outcomes and Baselines
3. Jurisdictions and agencies participating in the strategy
 - Local engagement
4. Factors influencing ability to meet the goal/outcome
5. Current efforts and gaps
 - Actions, tools or technical support needed to empower local government and others
6. Management Approach
 - Local engagement
7. Monitoring Progress
8. Assessing Progress
9. Adaptively Manage
10. Biennial Workplan
 - A summary of specific commitments, actions and resources each signatory and stakeholder will do to reach the two-year target for an outcome
 - Developed after management strategies are complete





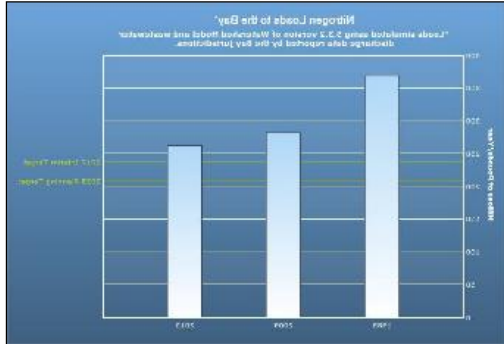
When Will We Know We Are There?

Vision —

The Chesapeake Bay Program partners envision an environmentally and economically sustainable Chesapeake Bay watershed with clean water, abundant life, conserved lands and access to the water, a vibrant cultural heritage and a diversity of engaged citizens and stakeholders.

Clean Water

Water Quality Goal



- *2017 WIP Outcome*
- *2025 WIP Outcome*
- *Water Quality Standards Attainment and Monitoring Outcome*

Toxic Contaminants Goal



- *Toxic Contaminant Research Outcome*
- *Toxic Contaminant Policy and Prevention Outcome*

Watersheds Goal



- *Healthy Watersheds Outcome*

Water Quality

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

Water Quality

Outcomes:

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

Management Approach Includes:

- Implementing the jurisdictional WIPs and 2 year milestone commitments
- Monitoring success
- Midpoint assessment
- Verification of BMPs

Toxic Contaminants

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

Toxic Contaminants Research

Outcome:

Continually increase our understanding of the impacts and mitigation options for toxic contaminants. Develop a research agenda and further characterize the occurrence, concentrations, sources and effects of mercury, PCBs and other contaminants of emerging and widespread concern. In addition, identify which best management practices might provide multiple benefits of reducing nutrient and sediment pollution as well as toxic contaminants in waterways

Management Approach Includes:

- Supply information to help make fish and shellfish safe for human consumption,
- Understand the influence of contaminants on the health of fish and wildlife,
- Document the occurrence and sources of these contaminants,
- Inform management approaches for mitigating toxic contaminants, and
- Identify issues of emerging concern, including microplastics and toxicity to pollinators.

Toxic Contaminants Policy and Prevention

Outcome:

Continually improve practices and controls that reduce and prevent the effects of toxic contaminants below levels that harm aquatic systems and humans. Build on existing programs to reduce the amount and effects of PCBs in the Bay and watershed. Use research findings to evaluate the implementation of additional policies, programs and practices for other contaminants that need to be further reduced or eliminated.

Management Approach Includes:

- developing a management approach that adds to the ongoing work of federal, state and local leaders to reduce and control contaminants, which contain research, policy and programmatic approaches related to stormwater, wastewater, atmospheric sources, in-stream sediment and contaminated sites.

An aerial photograph of a river and wetlands. The river is a light blue-grey color, winding through a green landscape. The wetlands are a darker green, with some areas appearing as small, irregular ponds or marshes. The overall scene is a natural, undeveloped landscape.

Healthy Watersheds

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

Healthy Watersheds

Outcome:

One-hundred percent of state-identified currently healthy waters and watersheds remain healthy

Management Approach Includes:

- Tracking the health of watersheds and our effectiveness in protecting them,
- Strengthening local commitment and capacity to protect healthy watersheds,
- Improving the protection of state-identified healthy watersheds and
- Supporting state-based efforts to improve assessment and protection of these healthy areas.

Abundant Life

Sustainable Fisheries Goal



- *Blue Crab Abundance Outcome*
- *Blue Crab Management Outcome*
- *Oyster Outcome*
- *Forage Fish Outcome*
- *Fish Habitat Outcome*

Vital Habitat Goal



- *Wetlands Outcome*
 - *Black Duck*
- *Stream Health Outcome*
 - *Brook Trout*
- *Fish Passage Outcome*
- *SAV Outcome*
- *Forest Buffer Outcome*
- *Tree Canopy Outcome*

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 Crab

Outcomes:

- **Blue Crab Abundance Outcome –**
 - maintain a sustainable crab population of 215 million adult females,
 - refine population targets through 2025 based on best available science.
- **Blue Crab Management Outcome –**
 - Manage for a stable and productive crab fishery including working with the industry, recreational crabbers and other stakeholders to improve commercial and recreational harvest accountability.
 - By 2018, evaluate the establishment of a Bay-wide, allocation-based management framework with annual levels set by the jurisdictions for the purpose of accounting for and adjusting harvest by each jurisdiction.

Management Approach Includes:

- Planning and implementation of a benchmark stock assessment
- Evaluation of the overall benefits of an allocation-based management framework.

Oysters

Outcome:

- Continually increase finfish and shellfish habitat and water quality benefits from restored oyster populations.
- Restore native oyster habitat and populations in 10 tributaries by 2025 and ensure their protection.
- As of 2014, six tributaries have been selected for oyster restoration: Harris Creek, the Little Choptank River and the Tred Avon River in Maryland, and the Lynnhaven River, Lafayette River and Piankatank River in Virginia.

Management Approach Includes:

- The planning and implementation of oyster restoration efforts;
- securing support and resources from federal, state and local partners; and
- considering future protection of the restored oyster reefs in the long-term.

Forage Fish

Outcome:

- Continually improve the Partnership's capacity to understand the role of forage fish populations in the Chesapeake Bay.
- By 2016, develop a strategy for assessing the forage fish base available as food for predatory species in the Chesapeake Bay.

Management Approach Includes:

- Defining what comprises the forage base,
- Determining the status of the forage base,
- Helping to inform fishery management decisions and
- Improving monitoring programs.

Fish Habitat

Outcome:

- Continually improving the effectiveness of fish habitat conservation and restoration efforts by identifying and characterizing critical fish and shellfish habitats in the Bay and its tributaries, and using new and existing tools to integrate information and conduct assessments to inform restoration and conservation efforts.
- These fish habitats can be any of various types, including underwater grass beds, streams, wetlands and others.

Management Approach Includes:

- Identifying and prioritizing threats to fish habitat,
- Proposing actions to manage those threats,
- Identifying and targeting high priority areas for conservation and restoration efforts, communicating the importance of fish habitat to the public and
- Evaluating ways to enhance our efforts based on successful examples from other regions.

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

Outcome:

- To continually increase the capacity of wetlands to provide water quality and habitat benefits, create or reestablish 85,000 acres of wetlands and enhance the function of an additional 150,000 acres of degraded wetlands by 2025

Management Approach Includes:

- Improving how wetland projects are reported,
- Prioritizing key areas for restoration,
- Better understanding barriers facing our projects and factors that lead to successful restoration, and
- Increasing the amount of local engagement in this work.

Black Ducks

Outcome:

- By 2025, restore, enhance, and preserve wetland habitats that support a wintering population of 100,000 black ducks, a species representative of the health of tidal marshes across the watershed.
- Refine population targets through 2025 based on best available science.

Management Approach Includes:

- Prioritizing habitats;
- Restoring, enhancing and limiting human disturbance in areas where these ducks have historically bred or wintered;
- Protecting wetlands and the lands adjacent to them; and
- Benefiting waterfowl habitat through education, permitting, and managing predators.

Stream Health

Outcome:

- Continually improve stream health and function throughout the watershed.
Improve health and function of 10 % of stream miles above the 2008 baseline for the Chesapeake Bay watershed

Management Approach Includes:

- Identifying measures for stream health,
- Linking programs with funding and technical resources,
- Developing and promoting guidelines for holistic stream restoration, and
- Communicating the benefits of restoration and maintenance to local leaders and communities.

Brook Trout

Outcome:

- Restore and sustain naturally reproducing brook trout populations in Chesapeake headwater streams with an 8% increase in occupied habitat by 2025

Management Approach Includes:

- Identifying priority areas to focus brook trout conservation efforts,
- Supporting fishery managers and local planners with decision support and prioritization tools, and
- Considering climate change vulnerability in determining where to conduct brook trout conservation projects

Fish Passage

Outcome:

- Continually increase available habitat to support sustainable migratory fish populations in Chesapeake Bay freshwater rivers and streams.
- By 2025, restore historical fish migratory routes by opening 1,000 additional stream miles, with restoration success indicated by the consistent presence of alewife, blueback herring, American shad, hickory shad, American eel and brook trout.

Management Approach Includes:

- prioritizing fish passage projects,
- continuing dam removal projects that are already underway, and
- developing additional projects to achieve the mileage goal.

Submerged Aquatic Vegetation

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.

Management Approach Includes:

- Improving the water clarity necessary to grow and maintain underwater grasses
Protecting existing grass beds while restoring those that are a priority.
- Enhancing research, citizen involvement and education

Riparian Forest Buffers

Outcome:

- Continually increase the capacity of forest buffers to provide water quality and habitat benefits throughout the watershed.
- Restore 900 miles per year of riparian forest buffer and conserve existing buffers until at least 70% of riparian areas throughout the watershed are forested.

Management Approach Includes:

- Coordinating federal, state and local leaders;
- Improving our development and coordination of programs;
- Linking programs with funding opportunities; and
- Using research and technology to prioritize and track projects

Tree Canopy

Outcome:

- Continually increase urban tree canopy capacity to provide air quality, water quality and habitat benefits throughout the watershed
- Expand urban tree canopy by 2,400 acres by 2025

Management Approach Includes:

- Working with local leaders,
- Increasing community investment in urban trees,
- Providing technical assistance and training,
- Increasing our knowledge of total tree canopy cover, and
- Improving the tracking and maintenance of urban trees.

Engaged Communities

a vibrant cultural heritage and a diversity of engaged citizens and stakeholders.

Stewardship Goal



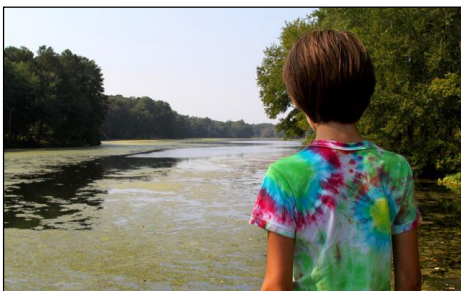
- *Citizen Stewardship Outcome*
- *Local Leadership Outcome*
- *Diversity Outcome*

Public Access Goal



- *Public Access Site Development Outcome*

Environmental Literacy



- *Student Outcome*
- *Sustainable Schools Outcome*
- *Environmental Literacy Planning Outcome*

A blurred background image showing people outdoors, possibly at a community event or gathering. The focus is on the text overlay.

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 local streams, rivers and a vibrant Chesapeake Bay.

Citizen Stewardship

Outcome:

Increase the number and diversity of trained and mobilized citizen volunteers with the knowledge and skills needed to enhance the health of their local watersheds

Management Approach Includes:

- Developing the means to measure progress and results of stewardship programs,
- Providing assistance to organizations to develop and implement successful programs,
- Expanding the number and diversity of citizen volunteers, and
- Empowering local residents to become citizen leaders.

Local Leadership

Outcome:

Continually increase the knowledge and capacity of local officials on issues related to water resources and in the implementation of economic and policy incentives that will support local conservation actions.

Management Approach Includes:

- Developing and expanding training and leadership opportunities,
- Facilitating peer to peer interactions among local officials,
- Improving the availability and accessibility of informational resources, and
- Identifying and improving key sources of information for local leaders.

Diversity

Outcome:

Identify minority stakeholder groups that are not currently represented in the leadership, decision making and implementation of current conservation and restoration activities and create meaningful opportunities and programs to recruit and engage them in the Partnership's efforts.

Management Approach Includes:

- Improve our communication and outreach efforts,
- Expand employment opportunities for underrepresented individuals and communities and
- Promote environmental justice through the meaningful involvement and fair treatment of all people.



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.

Public Access

Outcome:

By 2025, add 300 new public access sites, with a strong emphasis on providing opportunities for boating, swimming and fishing, where feasible

Management Approach Includes:

- Sustaining funding for development and maintenance of public access sites,
- Supporting more detailed assessments of potential new sites,
- Filling gaps in access along water trails,
- Assessing issues and needs related to urban public access and
- Annually tracking progress toward the goal of 300 new sites.



Environmental Literacy

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

Environmental Literacy

Outcomes:

- **Student Outcome**
- **Sustainable Schools Outcome**
- **Environmental Literacy Planning Outcome**

Management Approach Includes:

- Developing a comprehensive and systemic approach to environmental literacy for all students in the region that includes policies,
- Identifying and supporting the necessary tools, resources, programs and policies for all students to achieve science, citizenship and environmental literacy by graduation.

Conserved Lands

Land Conservation Goal



- *Protected Lands Outcome*
- *Land Use Methods and Metrics Development Outcome*
- *Land Use Options Evaluation Outcome*



Conserved Lands

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

Outcome:

By 2025, protect an additional two million acres of lands throughout the watershed—currently identified as high-conservation priorities at the federal, state or local level—including 225,000 acres of wetlands and 695,000 acres of forest land of highest value for maintaining water quality.

Management Approach Includes:

- Identifying lands that are high-priority for protection based on their ecological, historical and cultural value.
- Increasing funding and incentives and building public support for conservation efforts to help build a new generation of land stewards.
- Collaborating with new and existing partners to increase the capacity and effectiveness of our collective work.

Land Use Method and Metrics Development

Outcome:

Continually improve the knowledge of land conversion and the associated impacts throughout the watershed. By 2016, develop a watershed-wide methodology and local-level metrics for characterizing the rate of farmland, forest and wetland conversion, measuring the extent and rate of change in impervious surface coverage and quantifying the potential impacts of land conversion to water quality, healthy watersheds and communities. Launch a public awareness campaign to share this information with local governments, elected officials and stakeholders.

Management Approach Includes:

- Developing a plan for monitoring land use change,
- Measuring current rates of land conversion and understanding how those changes are affecting the natural environment
- Informing the decision-makers and stakeholders working to plan for the future growth of their communities.

Land Use Options and Evaluation

Outcome:

By the end of 2017, with the direct involvement of local governments or their representatives, evaluate policy options, incentives and planning tools that could assist them in continually improving their capacity to the reduce the rate of conversion of agricultural lands, forests and wetlands as well as the rate of changing landscapes from more natural lands that soak up pollutants to those that are paved over, hardscaped or otherwise impervious. Strategies should be developed for supporting local governments' and others' efforts in reducing these rates by 2025 and beyond.

Management Approach Includes:

- Determining the tools and policies that are currently in place across the watershed,
- Surveying the effectiveness of those options and
- Better understanding what local leaders need to slow the loss of natural and agricultural lands.

Climate Change

Climate Resiliency



- *Monitoring and Assessment Outcome*
- *Adaptation Outcome*

The background of the slide is a blurred photograph of a city street. In the foreground, a person's legs and feet are visible as they walk on a sidewalk. The background shows various buildings, including a prominent red brick building on the left and other structures further down the street. The overall scene is out of focus, emphasizing the text overlay.

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.

Climate Resiliency

Outcomes:

- **Monitoring and Assessment Outcome:** Continually monitor and assess the trends and likely impacts of changing climatic and sea level conditions on the Chesapeake Bay ecosystem, including the effectiveness of restoration and protection policies, programs and projects.
- **Adaptation Outcome:** Continually pursue, design, and construct restoration and protection projects to enhance the resiliency of Bay and aquatic ecosystems from the impacts of coastal erosion, coastal flooding, more intense and more frequent storms and sea-level rise

Management Approach Includes:

- Evaluating existing climate data and establishing a baseline;
- Monitoring, modeling and assessing climatic and sea level trends;
- Developing a conceptual model that links climate change to the success of our work;
- Developing a research agenda that improves our understanding of the linkages between climate and our work; and
- Biannually reassessing our priorities and revising our goals.
- Assessing current adaptation efforts;
- Assessing climate impacts and vulnerabilities;
- Reviewing and revising our conservation, restoration and protection goals and objectives to accommodate for a changing climate;
- Increasing the capacity of the Bay Program to prepare for and respond to climate change;
- Implementing adaptation projects; and
- Tracking the effectiveness of and ecological response to our adaptation work.

What is the Timeline?

- March 16 – April 30 Public input
- April 30 – June 30 Partners Finalize Management Strategies
- June 30 – December 2 year workplans are developed

How do I make sure implementation is happening?

An Accountability Framework

ChesapeakeStat



[About](#) [Chesapeake Bay Program](#) [Watershed Agreement](#) [Contact Us](#)

Managing Watershed Restoration

ChesapeakeStat improves information-sharing and decision-making at the Chesapeake Bay Program. As we work toward the goals of the Chesapeake Bay Watershed Agreement, we invite you to access reliable, results-oriented data and information about our progress and hold us accountable for our work.



CHESAPEAKE PROGRESS

Our progress is measured by accurate, up-to-date and accessible information on environmental health, habitat restoration and funding.



CHESAPEAKE DECISIONS

Our work is guided by a decision-making framework that supports adaptive management: learning while doing and adjusting our efforts as needed.



CHESAPEAKE DATA

Our decisions are influenced by a range of environmental data, which reach beyond those stories that are told by our indicators of environmental health and restoration success.



Access our TMDL [tracker](#), Two-Year Milestone [progress tool](#), Best Management Practice [review table](#), or Tracking Healthy Watersheds [tool](#).

[Learn more about the Watershed Agreement](#)





CHESAPEAKE
PROGRESS



CHESAPEAKE
DECISIONS



CHESAPEAKE
DATA

What's next?



Our progress toward the Watershed Agreement is measured by accurate, up-to-date and accessible information on environmental health, habitat restoration and funding.



Oberazzi/Flickr

Questions?

Learn more at
[www.chesapeakebay.net/
watershedagreement](http://www.chesapeakebay.net/watershedagreement)

Provide Comments at
[www.chesapeakebay.net/
managementstrategies](http://www.chesapeakebay.net/managementstrategies)

