Purpose

- Gain better understanding of
  - CBP indicators
  - Future of Chesapeake*Stat*
- Initial feedback related to
  - Indicators of most interest to local governments
  - How best to convey ind. info. to local govs.
- Decide how we continue this discussion

ChesapeakeStat

Outline

- Indicators Presentation
- Feedback on Indicators of Interest
- Chesapeake*Stat* Presentation
- Feedback on Conveyance of Information
- Feedback on Process for Ongoing Engagement

ChesapeakeStat

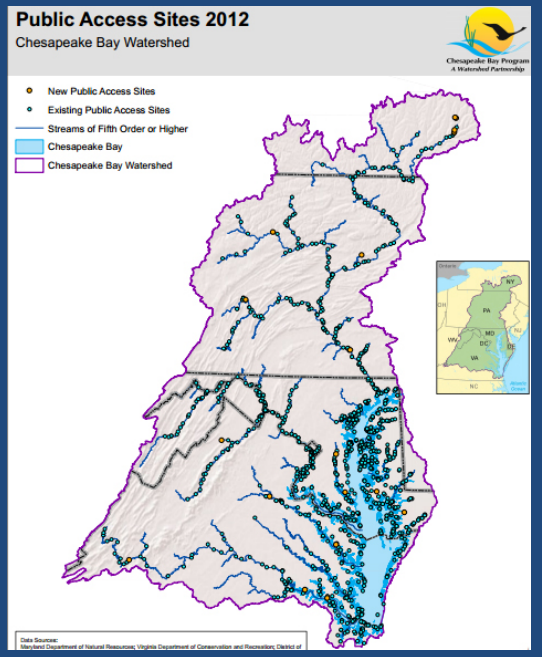
CBP Indicators Track Health and Restoration Progress

1. **RESTORATION indicators** track implementation actions
   - Examples:
     - Providing public access
     - Efforts to reduce pollution

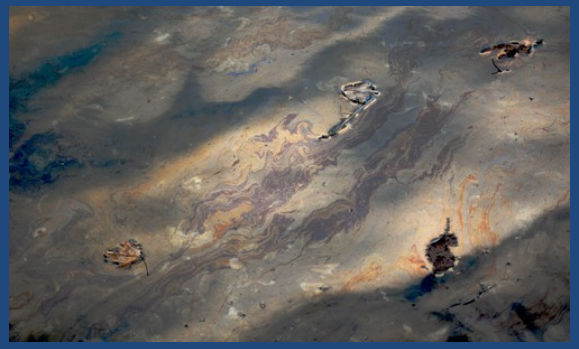
2. **HEALTH indicators** monitor living things, habitats, water quality
   Examples:
     - Blue crab abundance
     - Underwater grass abun.
     - Bay/stream/river water quality

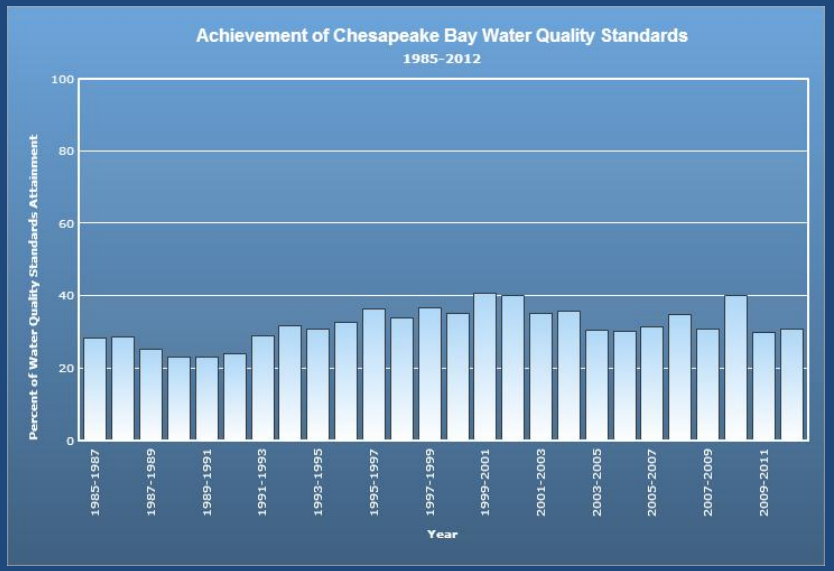
How are these related?

1. RESTORATION Indicators
   What we are doing



2. HEALTH Indicators
   What we are seeing

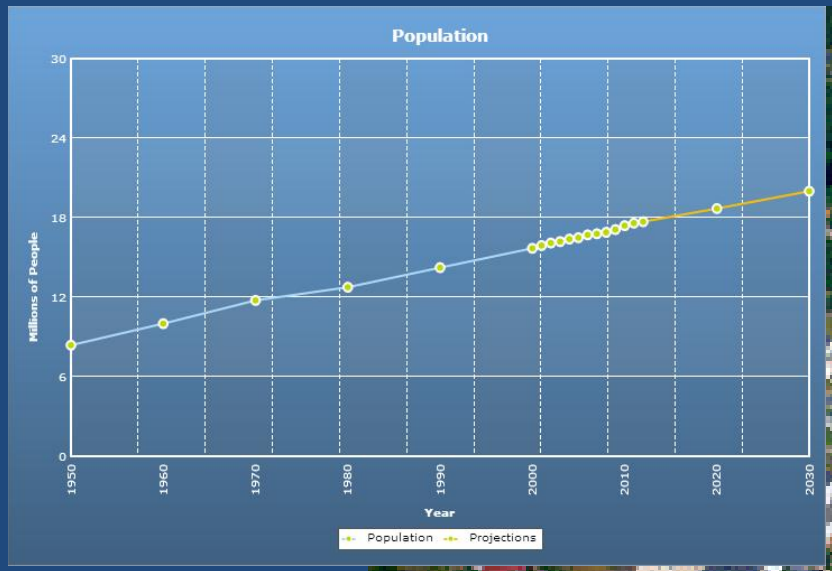


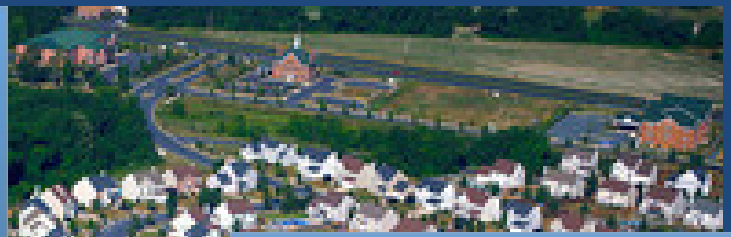


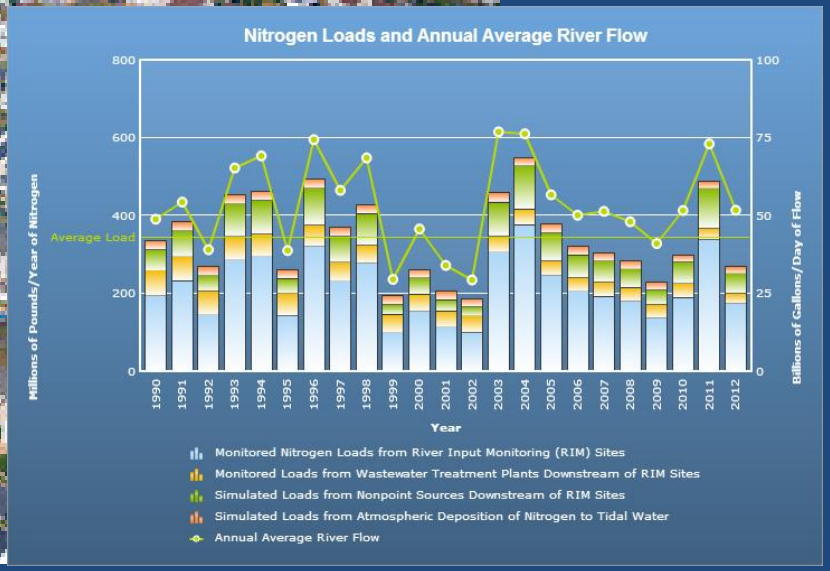
Factors Impacting Bay and Watershed Health

3. FACTORS (a subcategory of HEALTH)

What we have to consider as we look at the Health and Restoration Indicators





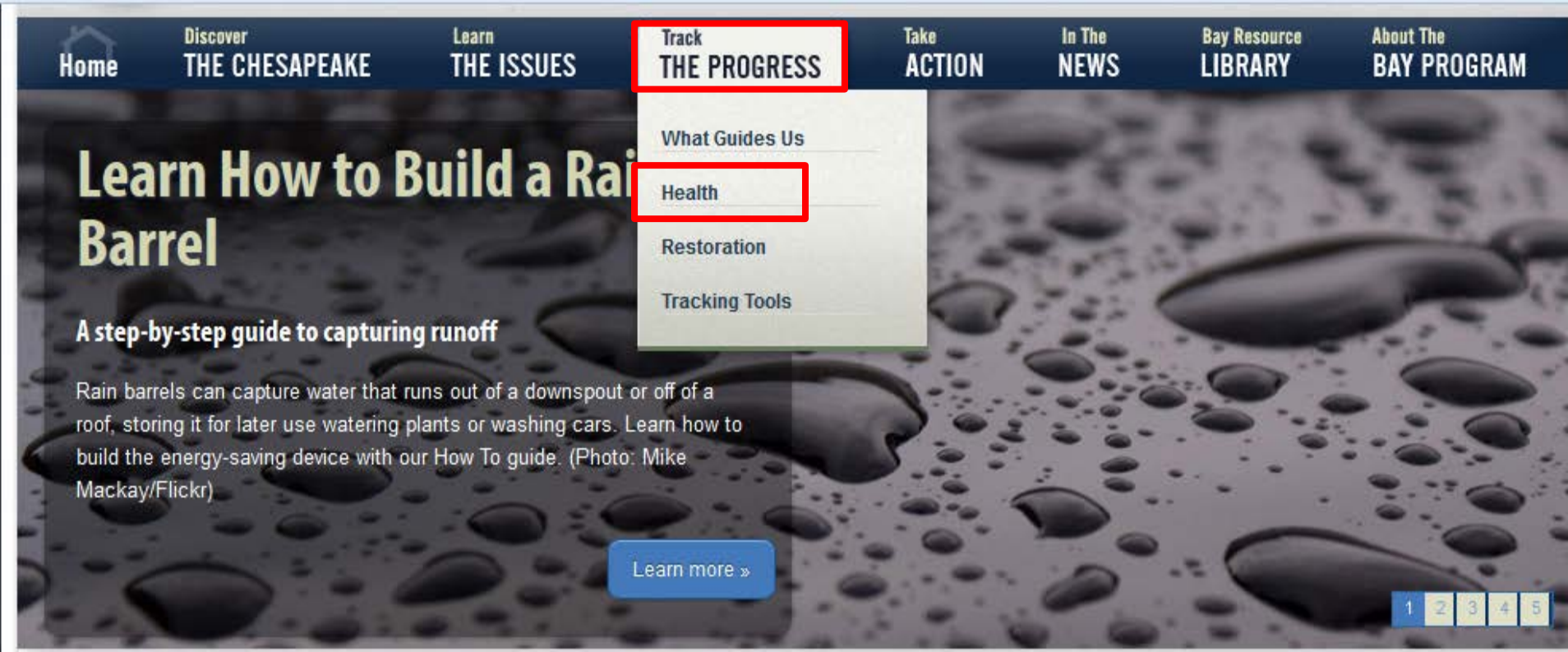


Guidance and Approval of CBP Indicators

- MB approves CBP indicators
- GITs and STAR Team develop, approve, maintain and recommend indicators to the MB
- Indicators Workgroup provides guidance and support
- Communications Workgroup
  - works closely with IWG on messaging
  - provides guidance to GITs as they develop indicators for public reporting

How do you find the indicator info you need from the homepage?

www.chesapeakebay.net/trackprogress



Chesapeake Bay News

March 06, 2014

Photo Essay: Winter Wildlife in the Chesapeake Bay watershed

The mid-Atlantic boasts a variety of wildlife viewing opportunities for year-round nature seekers

Critter of the Month

How is the Bay Doing?

Planting Forest Buffers

Chesapeake Bay Program

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  - Bay Health
  - Watershed & River Health
  - Factors Impacting Bay Health
- Restoration
- Tracking Tools

Health

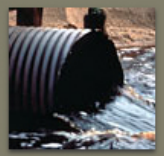
Scientists evaluate Chesapeake Bay health by monitoring important habitats, fish and shellfish, and water quality measures in the Bay and its watershed. They also track pollution, population and other measures that affect the Bay's health.

Bay Health

The Bay's health has slowly improved in some areas. However, the ecosystem remains in poor condition. The Bay continues to have polluted water, degraded habitats, and low populations of many fish and shellfish species.

River Health

The Bay watershed's streams, creeks and rivers eventually flow to the Bay, so their health directly affects the entire Bay. The Bay Program uses the most current monitoring data to assess the health of the rivers and streams that flow to the Bay.



Factors Impacting Bay Health

Everything that happens on the land affects the health of the Bay and its local waterways. Human activities and natural factors have a significant influence on the health of the Bay and its watershed.

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Bay Health

Scientists evaluate the Chesapeake Bay's health by monitoring important habitats, fish and shellfish, and water quality measures. These indicators are useful tools to gauge the overall health of the Bay and the animals that live in it.

The Bay's health has slowly improved in some areas. However, the ecosystem remains in poor condition. The Bay continues to have polluted water, degraded habitats, and low populations of many fish and shellfish species.

Habitats and Lower Food Web

Overall, the Bay's habitats and lower food web remain far below what is needed to support thriving populations of underwater life.

- Bay Grasses: In 2012, there were an estimated 48,195 acres of underwater grasses in the Chesapeake Bay achieving 26 percent of the 185,000-acre goal.
- Bottom Habitat: In 2012, 45 percent of the Bay and its tidal tributaries met the bottom habitat goal.
- Tidal Wetlands: As of 2005, there were approximately 283,946 acres of tidal wetlands in the Bay region.

Fish and Shellfish

Many of the Bay's fish and shellfish populations are suffering due to pollution, diseases, overharvesting and lack of food and habitat.

- Blue Crabs: The abundance of spawning-age female blue crabs in the Chesapeake Bay increased to 147 million in 2013, compared with 97 million in 2012.
- Oysters: According to 2008 data, there are an estimated 3 billion grams of oyster biomass in the Bay and its tidal tributaries.
- Striped Bass: Female striped bass spawning stock biomass measured 128 million pounds in 2012.
- American Shad: American shad abundance in the Bay in 2012 was 38 percent of the goal.
- Atlantic Menhaden: Researchers in Maryland caught menhaden in 25 percent of their hauls in 2010.

Water Quality

The Bay's water quality remains very poor. Too much pollution flows to the Bay and its streams, creeks and rivers.

- Water Quality Standards Achievement: Results for 2010-2012 indicated that 29% of the Chesapeake Bay was attaining water quality standards for dissolved oxygen, water clarity/underwater bay grasses and chlorophyll a.
- Chemical Contaminants: Based on the 2012 303(d) assessments of 92 tidal segments analyzed 74 percent had partial or full impairments due to chemical contaminants.

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Watershed and River Health

Healthy forests and streams are intrinsically linked to healthy rivers and the Chesapeake Bay. The Bay watershed's streams, creeks and rivers eventually flow to the Bay, so their health directly affects the entire Bay.

The Bay Program uses the most current monitoring data to assess the health of forests and streams.

Forests

Forested areas filter and retain water, thereby reducing pollution and improving water quality. They also provide valuable ecological services and economic benefits, including carbon sequestration, flood control, wildlife habitat and forest products. Forests protect and filter drinking water for 75 percent of the Bay watershed's residents. Forests also absorb air pollution and retain up to 85 percent of the airborne nitrogen from sources such as automobiles and power plants.

- **Forest Cover**: In the 1600s, forests covered 95 percent of the watershed. Now only 55 percent of the watershed is forested.

Health of Freshwater Streams

In general, streams in forested areas tend to be in good to excellent condition, whereas streams in large urban areas and heavily farmed areas tend to be in very poor to fair condition.

- **Health of Freshwater Streams in the Chesapeake Bay Watershed**: Between 2000 and 2010, 43 percent of sampled stream sites were in fair, good or excellent condition and 57 percent were in very poor or poor condition.

Flow-adjusted Pollution Trends

River flow and pollution concentrations vary from year to year, depending on precipitation. Scientists calculate flow-adjusted trends to remove these variations and assess whether pollution has changed over time.

- **Nitrogen in Rivers Entering Chesapeake Bay: Long-term Flow-adjusted Concentration Trends**: 70 percent of monitoring sites show improving trends since the mid 1980s.
- **Phosphorus in Rivers Entering Chesapeake Bay: Long-term Flow-adjusted Concentration Trends**: 73 percent of monitoring sites show improving trends since the mid 1980s.
- **Sediment in Rivers Entering Chesapeake Bay: Long-term Flow-adjusted Concentration Trends**: 28 percent of monitoring sites show improving trends since the mid 1980s.

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Factors Impacting Bay and Watershed Health

In the 1600s, forests covered 95 percent of the watershed. Now only 55 percent of the watershed is forested.

Everything that happens on the land affects the health of the Chesapeake Bay and its local waterways. Human activities and natural factors have a significant influence on the health of the Bay and its watershed.

The Bay Program uses the most current monitoring data to track the major factors that influence the health of the Bay and its watershed.

Pollutants

The Bay and its rivers are unhealthy primarily because of excess nitrogen, phosphorus and sediment pollution.

- **Nitrogen:** Approximately 269 million pounds of nitrogen reached the Bay during the 2012 water year, which is below the 1990-2012 average load of 343 million pounds.
- **Phosphorus:** Approximately 13.1 million pounds of phosphorus reached the Bay during the 2012 water year, which is below the 1990-2012 average load of 21.2 million pounds.
- **Sediment:** Approximately 2.35 million tons of sediment reached the Bay during the 2012 water year, which is below the 1990-2012 average load of 5.4 million tons.

Land Use

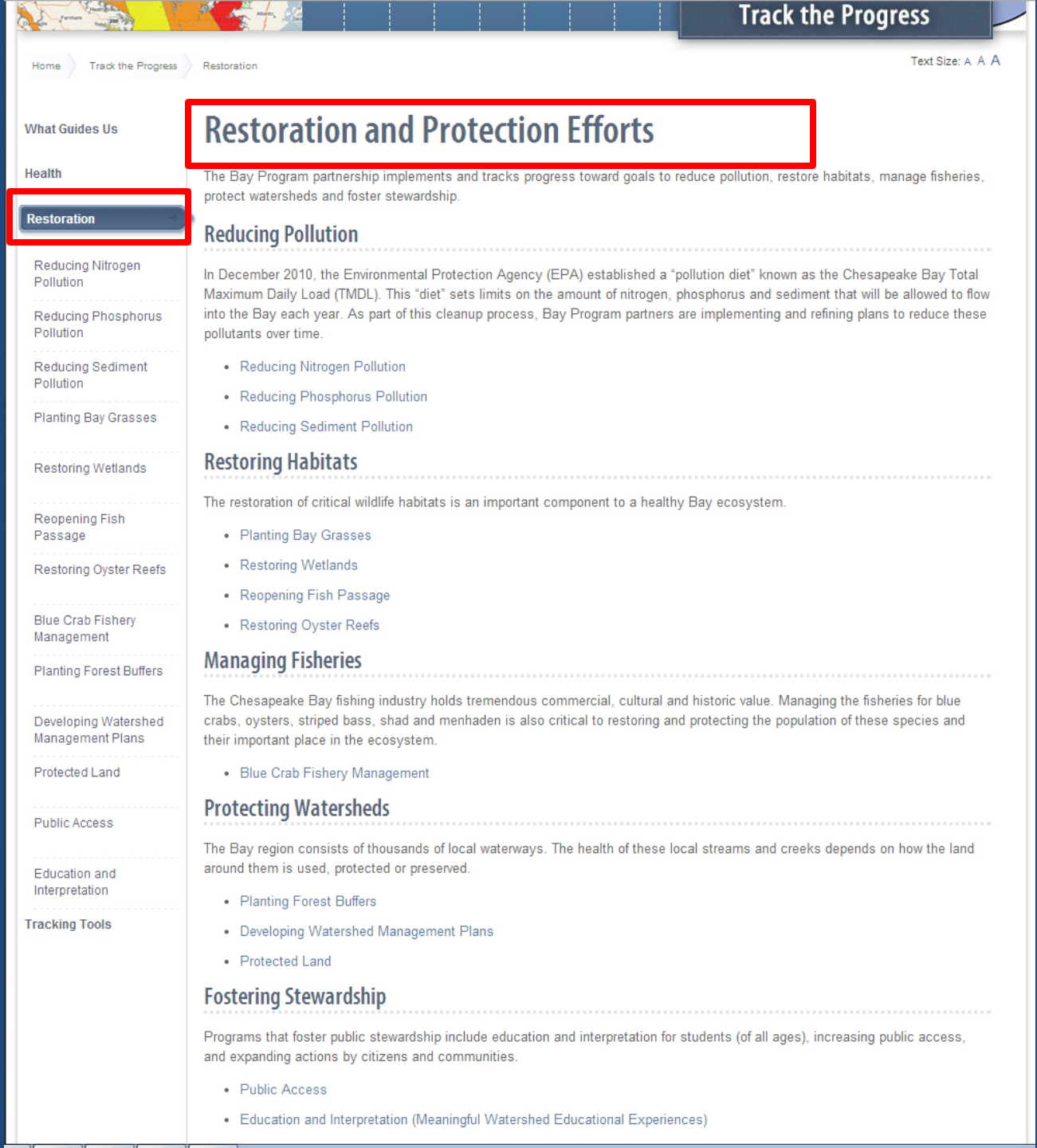
The Bay's decline is directly linked to population growth and corresponding development. Human activities offset efforts to clean up the Bay and its rivers. The Bay also needs enough healthy forests throughout the watershed to protect the health of local waterways.

- **Population Growth**: As of 2012, 17.7 million people were estimated to live in the Bay watershed.
- **Forest Cover**: 58 percent of the Bay watershed is forested, and development is reducing forests at the rate of 100 acres per day.

Natural Factors

Natural factors such as precipitation have an enormous effect on the Bay's health. Annual rain and snowfall determine how much water flows in rivers. The amount of pollution flowing into the Bay each year generally corresponds with the volume of water that flows from its rivers and the concentration of pollutants in that water.

- **River Flow**: Annual average river flow to the Bay during the 2012 water year was 52 billion gallons per day (BGD), which is below the 53.5 BGD mean flow from 1990-2012 and close to the 51 BGD mean flow from 1937-2012.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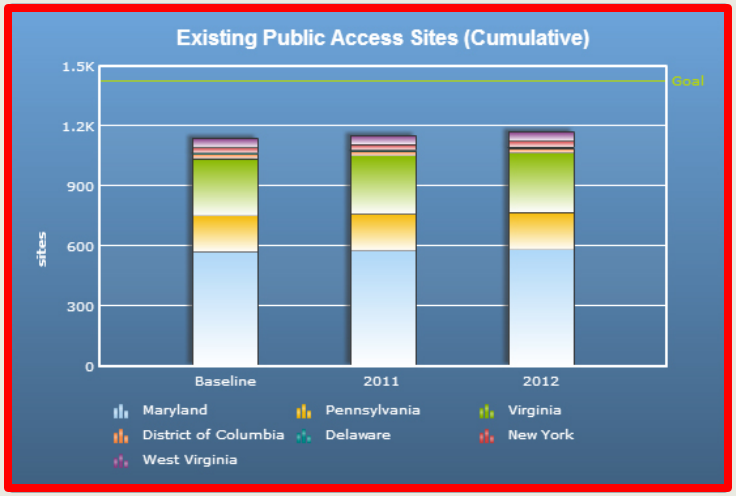
Restoring Wetlands
Reopening Fish Passage
Restoring Oyster Reefs
Blue Crab Fishery Management
Planting Forest Buffers
Developing Watershed Management Plans
Protected Land
Public Access
Education and Interpretation
Tracking Tools
Restoration and Protection Efforts
The Bay Program partnership implements and tracks progress toward goals to reduce pollution, restore habitats, manage fisheries, protect watersheds and foster stewardship.
Reducing Pollution
In December 2010, the Environmental Protection Agency (EPA) established a "pollution diet" known as the Chesapeake Bay Total Maximum Daily Load (TMDL). This "diet" sets limits on the amount of nitrogen, phosphorus and sediment that will be allowed to flow into the Bay each year. As part of this cleanup process, Bay Program partners are implementing and refining plans to reduce these pollutants over time.
Reducing Nitrogen Pollution
Reducing Phosphorus Pollution
Reducing Sediment Pollution
Restoring Habitats
The restoration of critical wildlife habitats is an important component to a healthy Bay ecosystem.
Planting Bay Grasses
Restoring Wetlands
Reopening Fish Passage
Restoring Oyster Reefs
Managing Fisheries
The Chesapeake Bay fishing industry holds tremendous commercial, cultural and historic value. Managing the fisheries for blue crabs, oysters, striped bass, shad and menhaden is also critical to restoring and protecting the population of these species and their important place in the ecosystem.
Blue Crab Fishery Management
Protecting Watersheds
The Bay region consists of thousands of local waterways. The health of these local streams and creeks depends on how the land around them is used, protected or preserved.
Planting Forest Buffers
Developing Watershed Management Plans
Protected Land
Fostering Stewardship
Programs that foster public stewardship include education and interpretation for students (of all ages), increasing public access, and expanding actions by citizens and communities.
Public Access
Education and Interpretation (Meaningful Watershed Educational Experiences)

Public Access

In 2012, a total of 18 new public access sites were opened to the public. This results in a total of 1,171 existing public access sites throughout the Chesapeake Bay watershed in 2012.

Annual | Maps



Data (45.75 KB)
Analysis & Methods (1.03 MB)

Importance

Open, green spaces and waterways with ample public access bolster public health and quality of life. People rely on these special places to exercise, relax, and recharge their spirits. Outdoor time strengthens family bonds and nurtures fit, creative children. At the same time, it builds personal connections with the very places that have shaped life in the region for centuries—especially its streams, rivers, and bays. Public access to natural areas also has a distinct economic value as tourism, much of which is associated with the area's waters, and is a potent force in the region.

The sense of place that evolves from outdoor experiences along Chesapeake waters often leads to a feeling of shared responsibility for the resources. People who enjoy the outdoors are more likely to become active citizen stewards, engaged in the many conservation and stewardship efforts taking place throughout the region.

Despite this importance, physical access to the Bay and its tributaries—the very resources that form the basis for the Chesapeake's unique identity—is limited.

Goal

The Strategy for Protecting and Restoring the Chesapeake Bay Watershed, issued under Executive Order 13508, established a watershed-wide public access goal to "increase public access to the Bay and its tributaries by adding 300 new public access sites by 2025." Public access site development is now being tracked towards this goal.

As the measure of progress toward this goal, public access sites are defined as those sites owned, operated, and/or managed expressly for a type of public access by:

1. Any unit of federal, state, or local government; or
2. A non-governmental organization operating under an agreement with a governmental agency.

Additionally, to be counted, a site must be located along a tidal stream or bay, a fifth-order or larger stream, or at the discretion of state planning staff an access site can be considered on streams smaller than fifth-order when such streams are part of a water trail or contribute to its development. A site must also be developed and expressly managed for a type of public access. The types of access included in this effort are as follows:

- Boat-related access: boat ramps, car-top boat launches, soft launches (supporting paddle craft, motor, and/or sail boats)
- Swimming access: designated areas appropriate for swimming

2. A non-governmental organization operating under an agreement with a governmental agency.

Additionally, to be counted, a site must be located along a tidal stream or bay, a fifth-order or larger stream, or at the discretion of state planning staff an access site can be considered on streams smaller than fifth-order when such streams are part of a water trail or contribute to its development. A site must also be developed and expressly managed for a type of public access. The types of access included in this effort are as follows:

- Boat-related access: boat ramps, car-top boat launches, soft launches (supporting paddle craft, motor, and/or sail boats)
- Swimming access: designated areas appropriate for swimming
- Fishing access: piers, bank fishing facilities or easements, and parking adjacent to the water
- Viewing access for water, wildlife, and shoreline areas: nature trails, hiking or biking trails, waterfront trails, boardwalks, and observation decks located at or leading to the water's edge.

The Public Access Planning Action Team involved in tracking site development also established a definition of "new" access sites to create consistency in tracking. As a result, the following conditions count towards the 2025 goal:

- Development of a new public access facility on a site owned and operated by a governmental entity or non-governmental organization operating under an agreement with an entity of government
- Development of a new type of access at an existing site, such as a fishing pier added to a site that currently has a boat ramp

Trends

A total of 1,171 existing public access sites were identified as providing access to the Chesapeake Bay and its streams (fifth-order and higher) as of December 31,2012. Specifically, there were 6 existing public access sites in Delaware, 582 in Maryland, 32 in New York, 187 in Pennsylvania, 297 in Virginia, 44 in West Virginia, and 23 in Washington, D.C.

In 2012, 4 new access sites were developed in Maryland, 4 new sites were developed in New York, 4 new sites were developed in Pennsylvania, and 6 new sites were developed in Virginia. No new sites were developed in the District of Columbia, Delaware, or West Virginia. Cumulatively, there were more public access sites developed in 2012 than in 2011; 18 new public access sites that were opened to the public in 2012 while 15 are estimated to have been developed in 2011.

Based on the opportunistic nature of public access site development, the lack of dependable funding for new access projects and the trends of public access development from the past decade, variation between the numbers of additional sites developed each year is anticipated.

Additional Information

Expanding Public Access

To address the need for additional public access to these waterways, the National Park Service and the Public Access Planning Action Team have developed a *Chesapeake Bay Watershed Public Access Plan*. As called for in the Strategy for Protecting and Restoring the Chesapeake Bay Watershed, this plan was designed to assess the demand for public access; describe (inventory) the existing public access facilities; assess barriers to public access; determine gaps in the public access system; identify opportunities for new access sites; and help direct federal, state, and local funding toward public access opportunities.

Who to Contact

Amy Handen
National Park Service (NPS)
(410) 260-2493

Source of Data

Chesapeake Bay Program

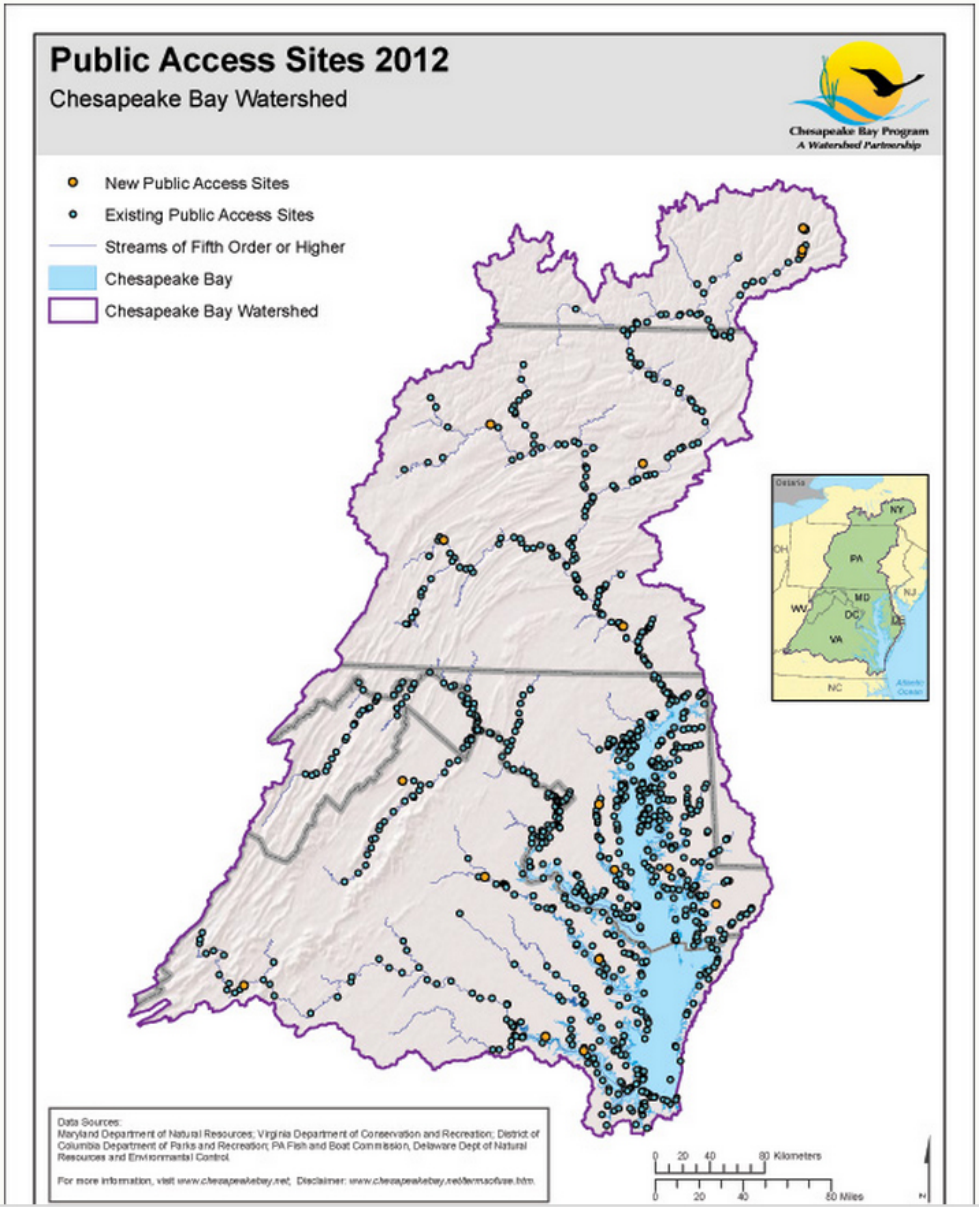
Related Indicators

- Protected Lands

Public Access

In 2012, a total of 18 new public access sites were opened to the public. This results in a total of 1,171 existing public access sites throughout the Chesapeake Bay watershed in 2012.

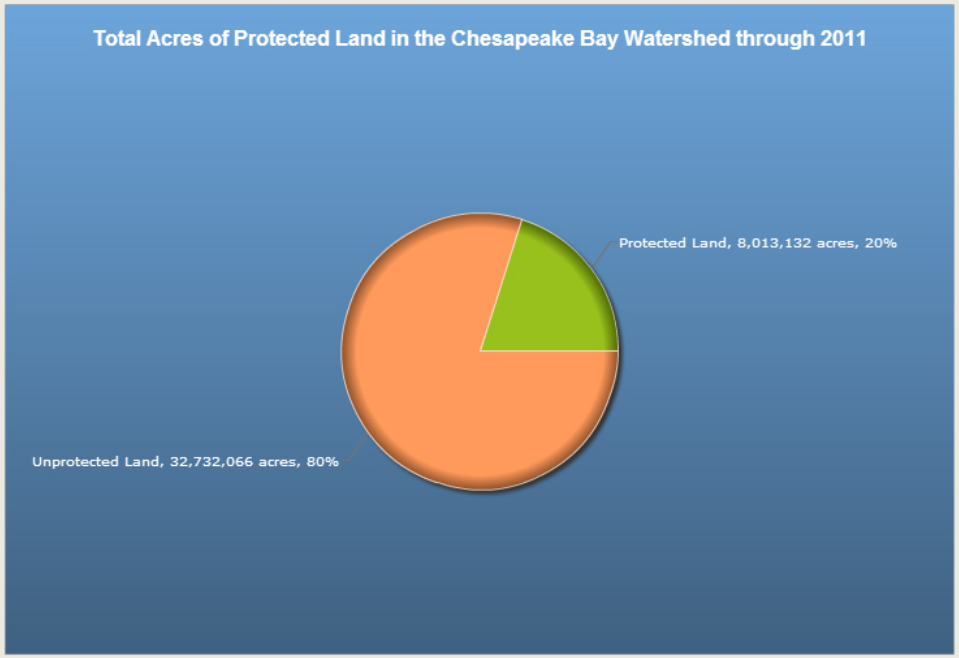
Annual | Maps



Protected Lands

As of the end of 2011, 8,013,132 acres of land have been permanently protected throughout the Chesapeake Bay watershed. This constitutes permanent protection of approximately 20% of the land in the Chesapeake Bay watershed.

Annual | Maps



Analysis & Methods (52.17 KB)

Data (105.97 KB)

Importance

States, local governments, federal agencies and non-governmental organizations have identified millions of acres of lands with important conservation values—lands key to working farms and forests, to maintaining water quality, to sustaining fish and wildlife, to preserving our history, and to providing for outdoor recreation. These lands are what form the ecological and cultural heritage of the Chesapeake watershed. Population growth, development and climate change increase pressure on some of the most valuable lands. For decades, Bay Program partners have pursued land conservation through permanently protecting important conservation lands by buying key properties, accepting donations, arranging for easements and purchasing development rights.

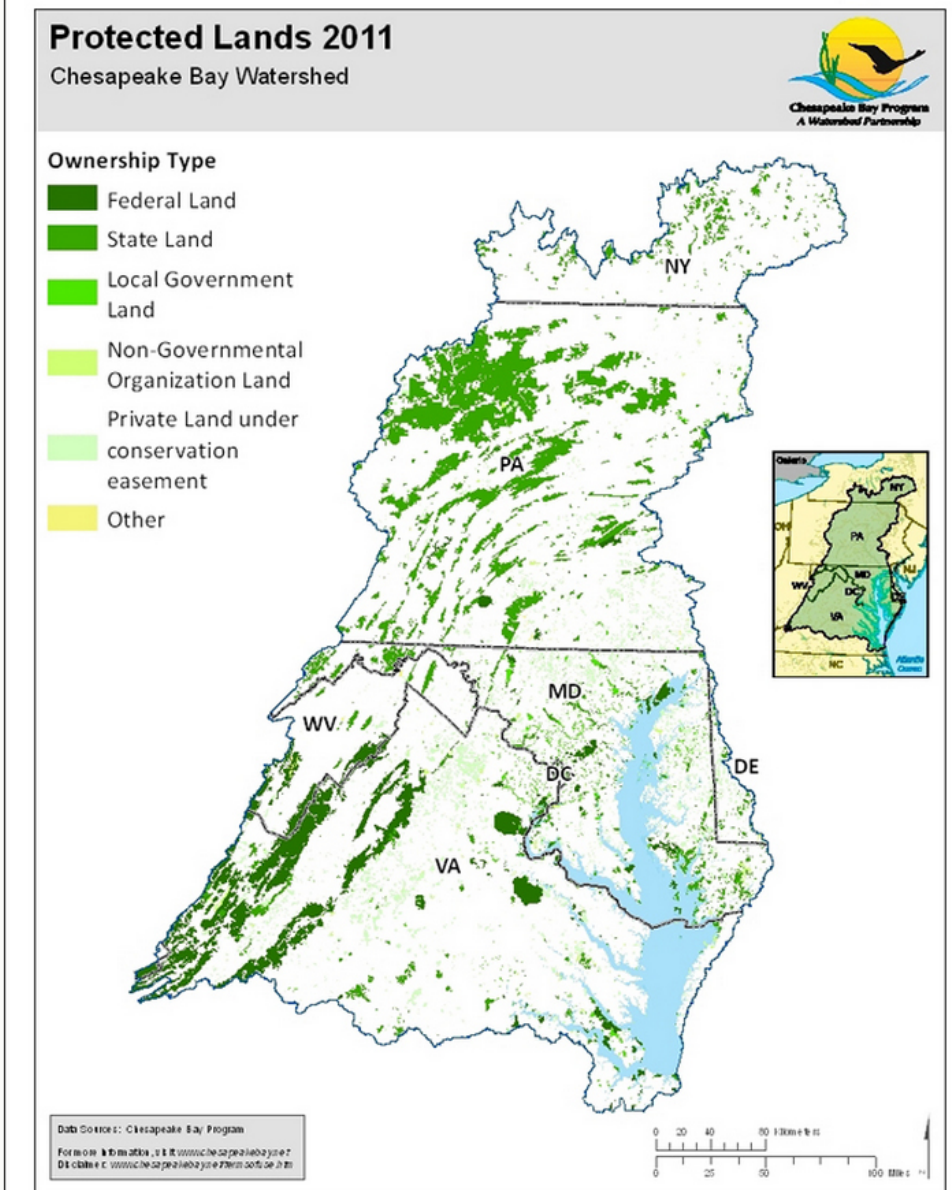
Goal

The Strategy for Protecting and Restoring the Chesapeake Bay Watershed, issued under Executive Order 13508, sets a goal of protecting an additional two million acres of lands throughout the watershed currently identified as high conservation priorities at the federal, state or local level, including 695,000 acres of forest land of highest value for maintaining water quality. This goal, set 25, expands the scope of previous land conservation tracking efforts to include protected lands throughout the entire

Protected Lands

As of the end of 2011, 8,013,132 acres of land have been permanently protected throughout the Chesapeake Bay watershed. This constitutes permanent protection of approximately 20% of the land in the Chesapeake Bay watershed.

Annual | Maps



Track the Progress

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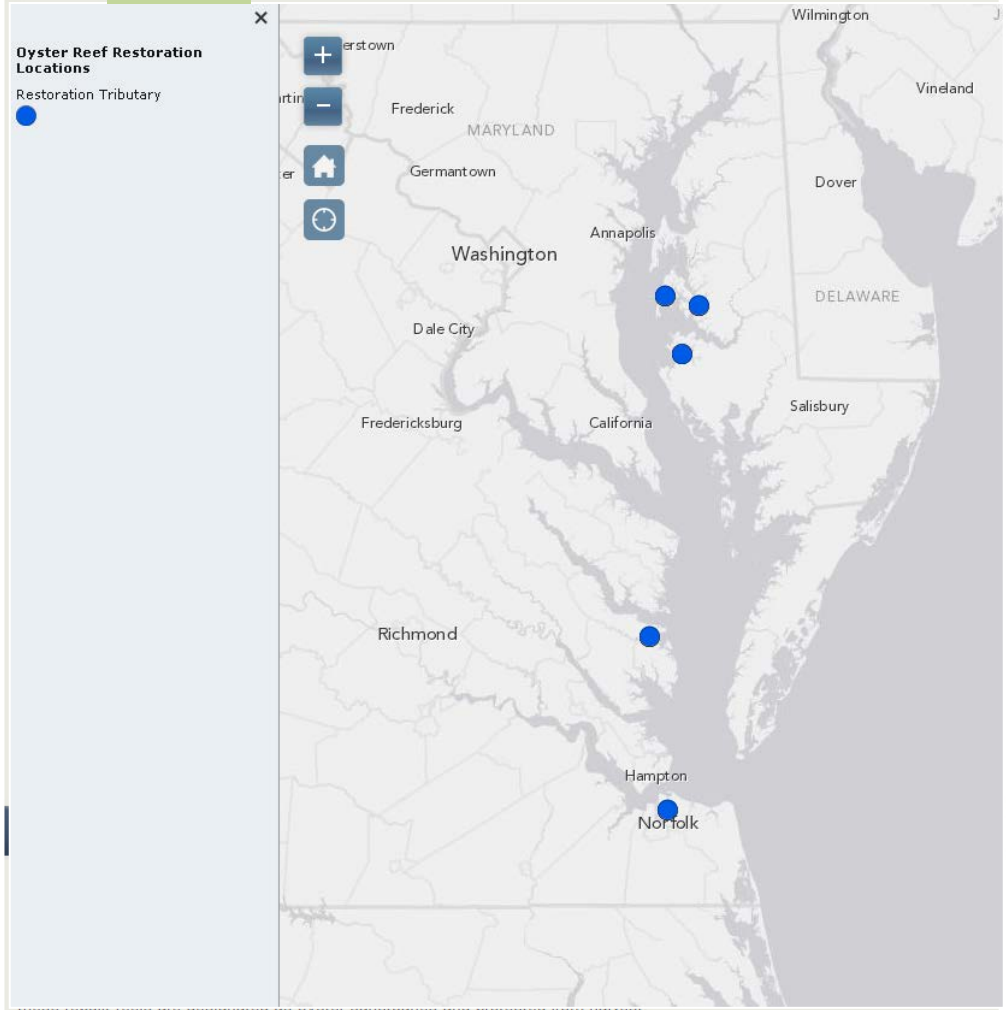
  - Blue Crab Fishery Management
  - Planting Forest Buffers
  - Protected Land
  - Public Access
  - Education and Interpretation
- Tracking Tools

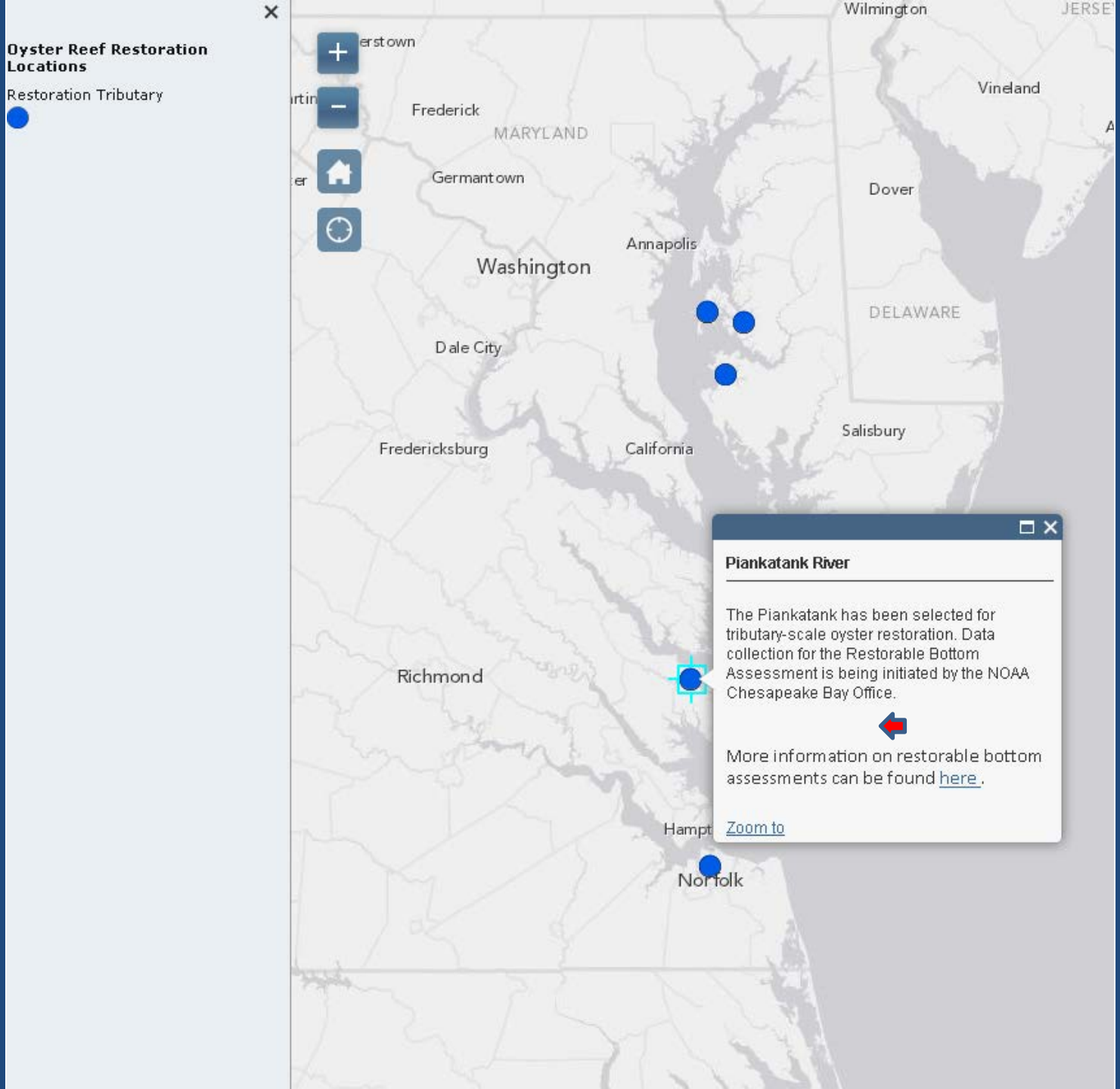
Restoring Oyster Reefs

Discuss progress related to new outcome.

Annual

Map




Oyster Reef Restoration Locations
Restoration Tributary
Wilmington
Vineland
Frederick
MARYLAND
Germantown
Dover
Annapolis
Washington
DELAWARE
Dale City
Salisbury
Fredericksburg
California
Piankatank River
The Piankatank has been selected for tributary-scale oyster restoration. Data collection for the Restorable Bottom Assessment is being initiated by the NOAA Chesapeake Bay Office.
More information on restorable bottom assessments can be found here.
Zoom to
Richmond
Norfolk

NOAA CHESAPEAKE BAY OFFICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

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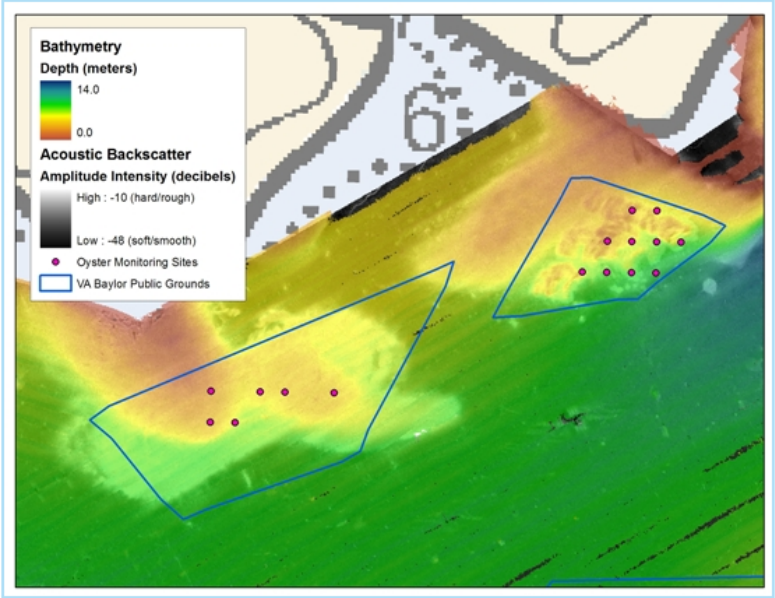
Oyster Restoration Mapping Support

Native oyster restoration in the Chesapeake Bay focuses on creating hard surfaces (reefs) for larval oysters to settle on and planting hatchery-raised juvenile oysters (called spat) that are attached to oyster shells. Acoustic seabed surveying systems are used to identify oyster habitat and planting locations that will maximize the survival of spat-on-shell. Preferable restoration sites are hard, geologically stable terraces, of generally uniform depth, of moderate to high rugosity (a measure of surface irregularity), with sand or oyster shell as the base. Sites are typically located on historic oyster bottom.

The NOAA Chesapeake Bay Office provides Maryland and Virginia oyster restoration partners with Geographic Information System (GIS)-ready acoustic mapping products that identify current distribution, structure and quality of oyster habitat.



Composite image of backscatter and partially transparent bathymetry data collected by the NOAA Chesapeake Bay Office with historic oyster boundaries and recent monitoring sites in the Great Wicomico River, Virginia.

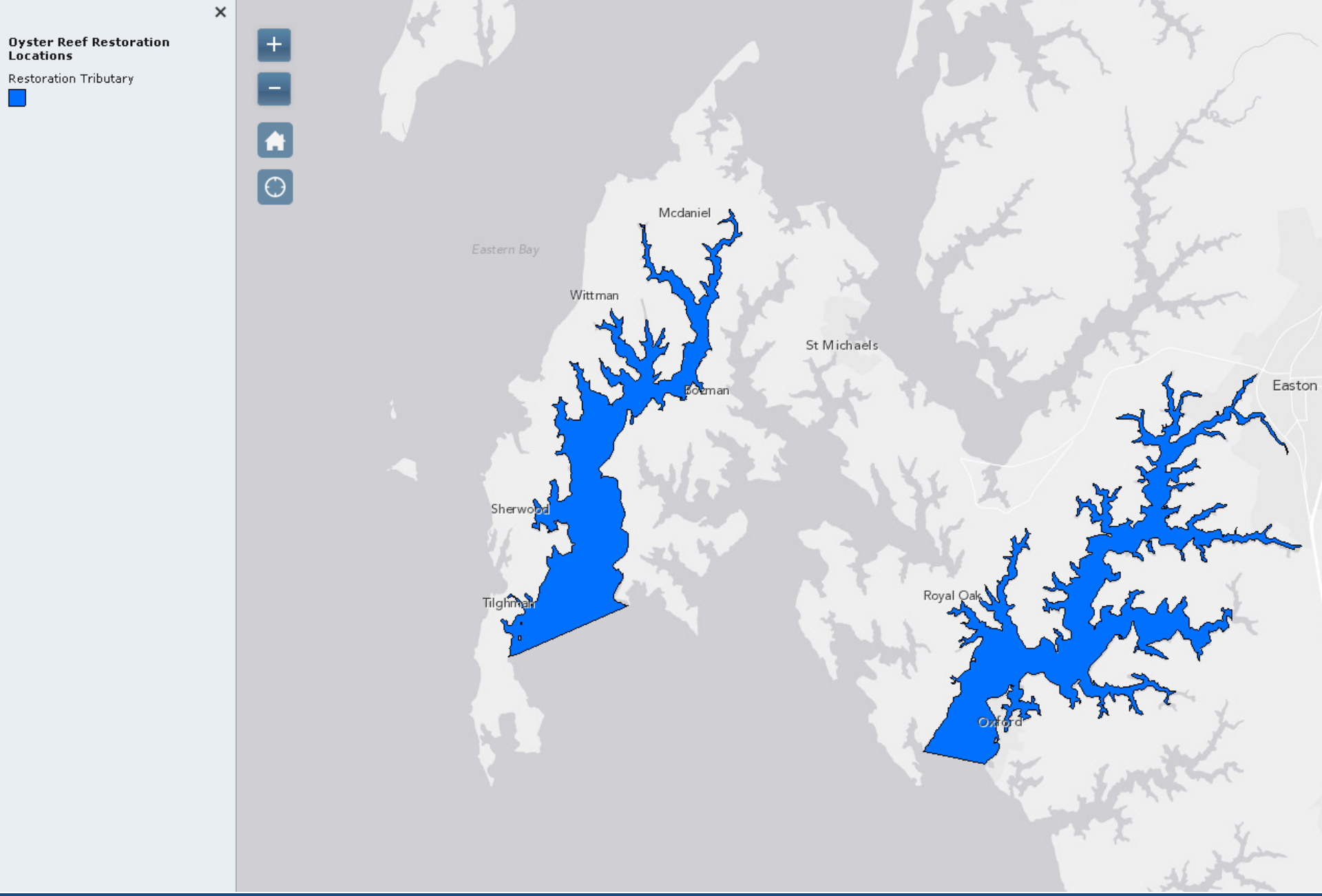
In Maryland, NOAA has teamed wth the Maryland Geological Survey to provide the Oyster Recovery Partnership with mapping products and suggested boundaries for restoration sites. Boundaries are derived from side-scan sonar imagery, sub-bottom profiling, single beam seabed classification, and bathymetry data.

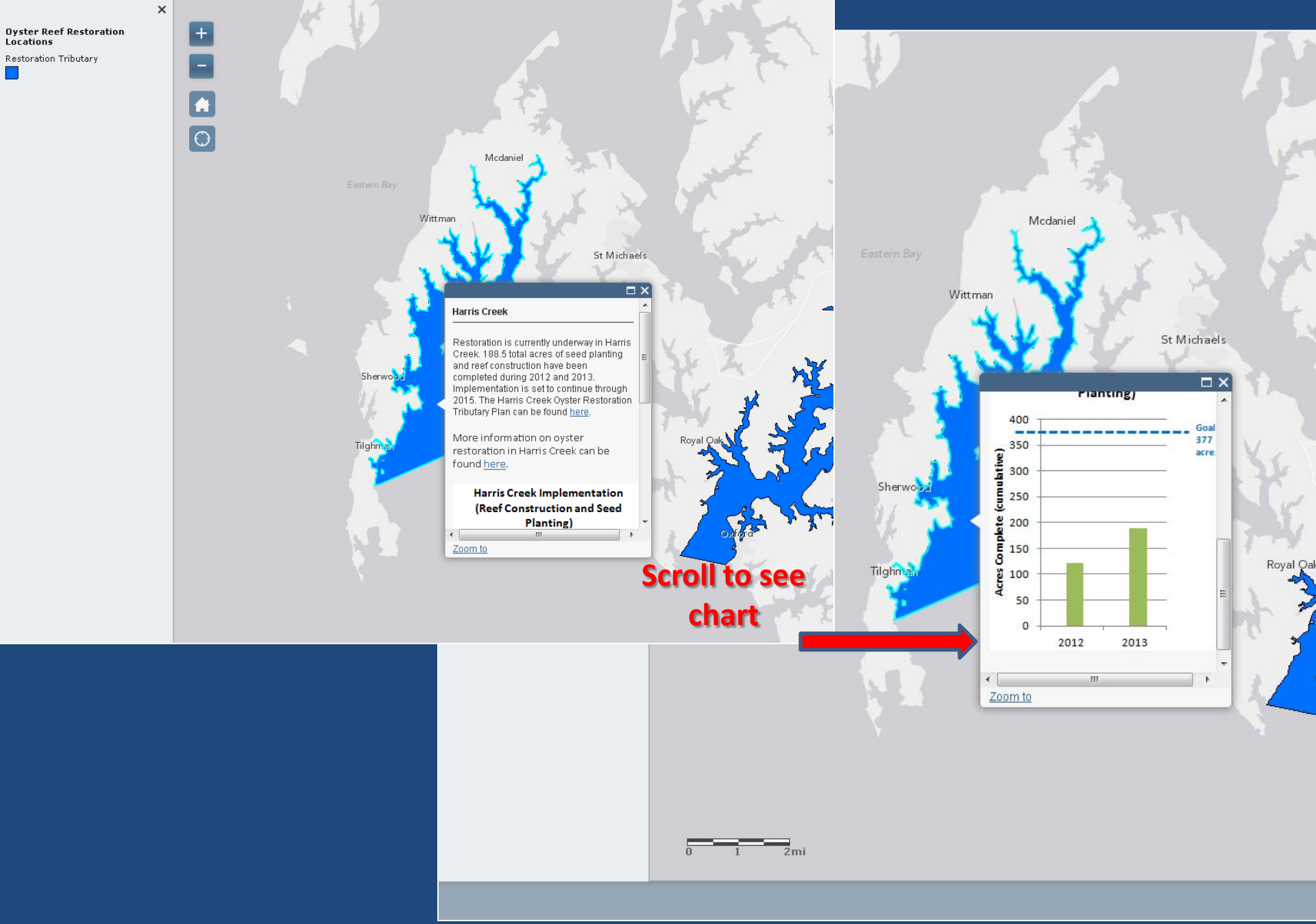
Related NOAA Resources

- NOAA Chesapeake Bay Office Acoustic Seafloor Mapping

Also of Interest

- Maryland Geological Survey
- Oyster Restoration Partnership


Oyster Reef Restoration Locations
Restoration Tributary
Mcdaniel
Eastern Bay
Wittman
St Michaels
Easton
Sherwood
Tilghman
Royal Oak
Oxford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St Michaels
Harris Creek
Restoration is currently underway in Harris Creek. 188.5 total acres of seed planting and reef construction have been completed during 2012 and 2013. Implementation is set to continue through 2015. The Harris Creek Oyster Restoration Tributary Plan can be found here.
More information on oyster restoration in Harris Creek can be found here.
Harris Creek Implementation (Reef Construction and Seed Planting)
Zoom to
Sherwood
Tilghman
Royal Oak
Oxford
Scroll to see chart
Planting)
Acres Complete (cumulative)
400
350
300
250
200
150
100
50
0
2012
2013
Goal 377 acre
Zoom to
0
1
2mi

Initial Feedback

Which indicators would be of most interest to local governments?

Chesapeake*Stat* Redesign and Redevelopment

- Another CBP tool to assess progress and enhance accountability and transparency.
- Being redesigned to track progress toward new Bay Watershed Agreement:
  - Goals
  - Outcomes,
  - Management strategies
  - Funding to support the strategies

Chesapeake*Stat* Redesign and Redevelopment

- Target audiences
  - Public Oversight groups
  - Internal Oversight groups
  - Federal Oversight groups
- Redesign will enable target audiences to
  - Understand and act upon information
  - Use information to inform decisions
  - Facilitate implementation of adaptive management procedures
  - Look to and rely upon ChesapeakeStat as authoritative source of Chesapeake Bay performance information

Initial Feedback

- What is the best way to convey indicator information to local governments?

- What is the best way to continue to solicit your feedback?
  - As a full group at the next quarterly?
  - Via formation of a workgroup?

ChesapeakeStat