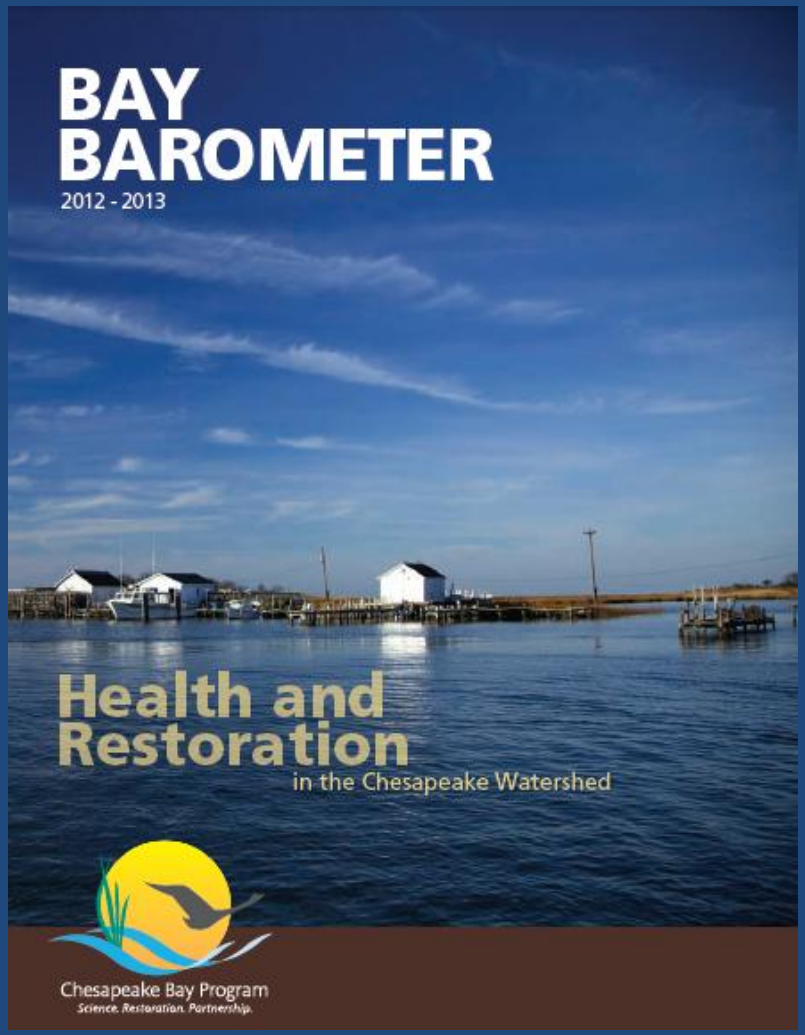


2012-13
Bay Barometer

Management Board Meeting

November 21, 2013

Margaret Enloe (Alliance for the Bay)

Director, CBP Communications &
Coordinator, Comm. Wkgp.

Chesapeake Bay Program
Science, Restoration, and Partnership

Design/Layout updates

- Summarizes 2012/13 data updates already done
- Public Friendly
- Concise
- New:
  - At A Glance summary
  - Icons for indicators
    - Simple, clear
    - Will be integrated into web

AT A GLANCE

BAY HEALTH

Water Quality
29% of the Bay and its tidal rivers met overall conditions for healthy waters, measured by amounts of oxygen, algae, water clarity/ underwater grass abundance

Underwater Grasses
48,195 acres of underwater grasses found in the Bay and shallows of tidal rivers

Bottom Habitat
45 percent of the surveyed locations in the Bay had healthy populations of bottom-dwelling worms, clams and creatures that are the foundation of the food web

Blue Crabs
147 million spawning-age female blue crabs in the Bay

American Shad
Rise in spawning shad in the rivers of the watershed

Chemical Contaminants
74 percent of tidal segments analyzed were partially or fully impaired by chemical contaminant

RESTORATION

Reducing Pollution to the Bay and its Tidal Rivers
Since 2009, pollution loads have been reduced by:
- Nitrogen - 18.5 million pounds
- Phosphorus - 1.3 million pounds
- Sediment - 431 million pounds

Wetlands
23,901 acres of wetlands established or reestablished in the watershed since 2010

Forest Buffers
7,764 miles of forests added along the edges of streams and rivers in the watershed since 1996

Fish Passage
2,543 miles of rivers and streams reopened to migratory and resident fish across the Bay watershed since 1988

Public Access
1,171 sites in the watershed, with 18 new in 2012, offer people access to local waters for boating, fishing, sight-seeing and enjoying the natural beauty and resources

For more detailed information go to chesapeakebay.net

Bay Barometer
The Chesapeake Bay is a dynamic system. Across the watershed, rainfall, temperature and other conditions can fluctuate from month to month and year to year, impacting the surrounding environment. But tracking changes in ecological health over time allows scientists to understand these natural variations as well as the long-term effects of restoration work.

Understanding the effects of our management actions and our progress toward meeting our health and restoration goals requires a complex set of tools, from monitoring stations to computer simulations of the Bay watershed. These and other tracking tools helped produce the data in this report, which reflect changes in the Bay over the course of many years. Water quality, pollution loads and "indicators" of water quality, fisheries, habitat, freshwater streams, pollution reductions and stewardship provide a snapshot of the Bay and its watershed and our efforts to restore it.

2000-2010 Stream Health

Stream conditions still need to improve
The abundance, diversity and health of tiny, bottom-dwelling creatures in a stream are good indicators of its overall health. Just over half of sites surveyed between 2000-2010 scored lower than a 3 on a 1 to 5 scale measuring the health of their bottom habitat. Overall, almost 60 percent of non-tidal streams remain in poor or very poor condition. They are affected by too much sediment, toxic contaminants, loss of trees and polluted runoff from surrounding landscapes.

This does not mean our pollution-reduction efforts aren't working. In fact, there is often a lag time between when restoration or pollution-reducing actions are done and when visible improvements in water quality can be seen. As restoration work continues, scientists expect to see responses in local waters and eventually the Bay.

Nutrient levels improving in most streams but sediment lags behind
Partners in the watershed are working to reduce nutrient and sediment pollution to improve water quality in the Bay. Over the long-term, 2/3 of the river monitoring sites in the watershed show improvements in concentrations of nitrogen and phosphorus, while less than half of the sites show improvements in sediment.

Restoration

What we are doing

The Chesapeake Bay Program and the Bay Watershed

The Chesapeake Bay is the largest estuary in North America. Its 64,000-square-mile watershed spans parts of Delaware, Maryland, New York, Pennsylvania, Virginia and West Virginia, and all of the District of Columbia. This productive estuary is home to more than 3,600 species of plants and animals and has played an important role in the region's culture, economy and [illegible] remains an important recreational and economic resource.

The Chesapeake Bay Program works to advance science, policy [illegible] across the watershed. Bay Program partners have reduced pollution [illegible] land and water habitats and improved the management and restoration [illegible] critical Bay fisheries. Partners have also supported the federally mandated Total Maximum Daily Load: a pollution diet that sets limits on the [illegible] nutrients and sediment that can run into the Bay each year.

Learn the Issues: Wastewater

Wastewater treatment plants remove bacteria and some [illegible] and phosphorous coming from homes, businesses and industries. Technological upgrades can remove more pollutants from wastewater before it discharges into local rivers and streams. As of 2012, 66 of the watershed's 467 larger treatment plants had pollution controls in place to meet the Bay's water quality standards. One plant under construction in West Virginia will remove 90,000 pounds of nitrogen and 93,000 pounds of phosphorous from its wastewater each year.

NEWS: Restoring Fish Passage

Soon, more than 40 miles of the Patapsco River will be reopened to herring, alewife and American shad, as the watershed's fourth-largest dam is set to be removed.

Wetlands Restored

2012: 23,901 acres established or reestablished watershed-wide

23,901 acres

Because wetlands filter water, prevent erosion and provide habitat to a number of Bay critters, boosting their acreage through restoration and new plantings is as important as protecting them through land purchases or conservation easements.

Forest Buffers Planted

2012: 285 miles planted

Looking Toward the Future

A New Watershed Agreement

In 1983, the first Chesapeake Bay Agreement was signed. Thirty years later, Bay Program partners are working to guide the continued evolution of the Bay ecosystem with a new Chesapeake Bay Watershed Agreement.

This new plan for collaboration will further our goal to protect and restore the living resources of the Bay and its tributaries and take a forward-facing approach to our efforts into the future.

Reducing Pollution

Communities and leaders across the watershed have made great strides in reducing the pollution they are sending into rivers and streams. Computer simulations of thousands of pollution control measures show local, state and federal Bay Program partners have achieved between a quarter and a third of their 2025 pollution reduction goals.

Pollution loads decrease when our land-based actions improve. Towns and cities can make technological upgrades to wastewater treatment plants or "green" roofs, sidewalks and parking lots to better capture stormwater runoff. Homeowners can install rain gardens or plant big trees to boost forest cover in their neighborhoods. Farmers can protect streams from livestock, plant cover crops to hold soil in place and use just the right amounts of fertilizers to grow abundant crops.

Total Pollution Loads to the Bay
In millions of pounds/year (Simulated)

Nitrogen | Phosphorus | Sediment

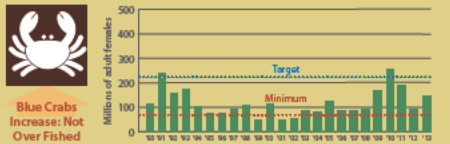
Health

What we are seeing

Learn the Issues: Lag Times

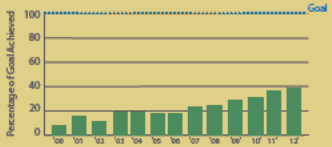
There is often a delay between when restoration is done and when visible improvements in water quality or stream conditions can be seen. These "lag times" can vary based on restoration project, geology of the site, distance from the waterway and many other factors. For example, the full benefits of efforts to reduce amounts of nitrogen flowing into local waters can be several decades due to the slow movement of groundwater. Phosphorus and sediment reductions can take even longer. The full benefits of a newly-planted forest buffer along a stream will only be known when the trees have reached maturity. As restoration work continues, the Bay and its watershed is expected to respond.

Blue Crabs Increase: Not Over Fished



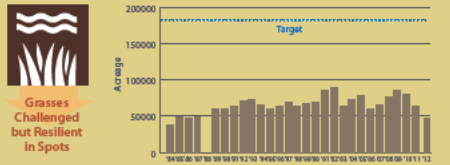
Between 2012 and 2013, the abundance of spawning-age female blue crabs in the Bay increased 51 percent. While numbers are below the 215 million target, they are above the overfished threshold. A sustainable blue crab stock means a more stable Bay economy, and an increase in blue crab abundance is a sign that management methods to conserve adult female crabs are working.

American Shad Show Positive Return



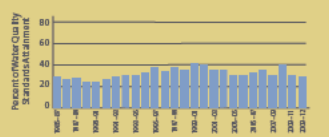
Shad data is based on information from the James, Potomac, Rappahannock, Susquehanna and York rivers, where scientists hope to continue increasing spawning stocks. Shad abundance in the Potomac River is driving the Bay-wide trend. American shad fotman important link in the Bay food web.

Grasses Challenged but Resilient in Spots



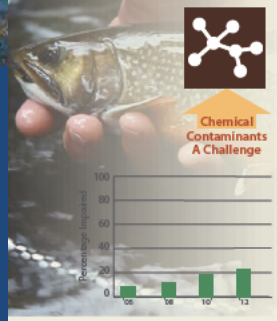
The abundance of Underwater grasses declined 21 percent between 2011 and 2012. Scientists attribute the change to warmer-than-normal, summer water temperatures in 2010 and strong storms seen in the fall of 2011. Healthy and abundant beds of bay grass improve water clarity, reduce shoreline erosion, provide food of waterfowl and offer shelter to striped bass, blue crabs and other Bay critters.

Water Quality Still Challenged



This new indicator measures progress towards the achievement of water quality standards for dissolved oxygen, water clarity/underwater bay grasses and chlorophyll a and provides a way to track improving conditions. Delaware, the District of Columbia, Maryland, and Virginia evaluate their portion of the Bay's tidal waters in this manner, too.

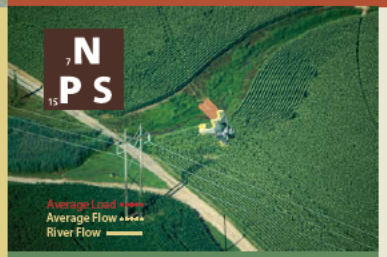
Chemical Contaminants A Challenge



Of the 92 segments of tidal waters analyzed, 74 percent had partial or full impairments due to chemical contaminants. Such contaminants threaten fish health, contribute to fish kills in streams and rivers and lead to "consumption advisories" limiting the number of fish people should eat. The proper disposal of medicines and the correct use of pesticides can help lower toxins in our environment.

Factors

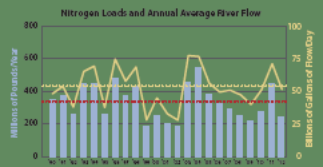
What we have to consider

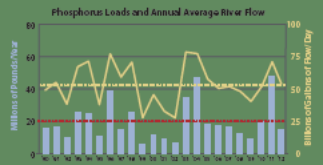


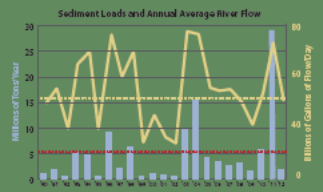
Fresh Water Flow/Nutrient and Sediment Loads

Conditions in the Bay vary each year based on the quantities of fresh water from rain and snowfall that flow down its rivers and streams. In wet years with high fresh water river flow, more pollution is carried downstream to the Bay, while dry years result in lower flow of fresh water and fewer pollutants in the waters. The charts offered this year show the dramatic difference weather conditions can have on pollutants reaching the main Bay.

While 2011 was one of the five wettest years on record, 2012 was closer to average resulting in much less nitrogen, phosphorus and sediment in our waters.

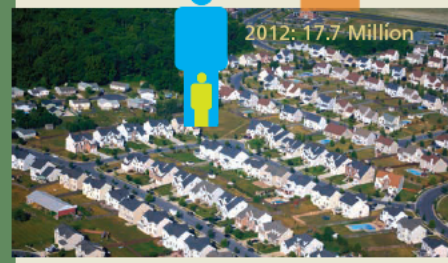






Population - Increasing

The health of our waters is directly linked to how we live and use the land. As the watershed's population continues to rise, our homes, commercial centers and roads expand. While natural areas like forests and wetlands have a positive effect on the Bay's health, these developed lands often pollute local rivers and streams. By 2030, experts predict the watershed's population will reach 20 million. Smart growth and land conservation are critical to balancing the pressures of a rising population.



Rainfall and River Flow - Near Average

Each day, billions of gallons of fresh water flow from backyards, streets, and farms to rivers and streams and the Bay. Annual amounts of "river flow" has a direct impact on watershed health: as rainfall and river flow increase, more pollution is pushed into the Bay. As they decrease, pollutants can become trapped in tributaries, fueling algae growth and reducing water clarity.

While the past decade has seen highly variable river flow – from record flooding to record droughts, 2012 saw a near-average river flow of 52 billion gallons per day.

For more detailed information go to chesapeakebay.net

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Design: Marti Bate Design

Chesapeake Bay Program
Science, Restoration, and Partnership

Public Release To Include

- *News conference call – **12/2***
  - preceded by Media advisory
- News release – w/ links to images, data, videos
- Online
  - Web story and webpage, Bay Brief, Chesapeake Currents
  - Social Media outlets

Key Messages Overall

1. *Bay Barometer offers a public-friendly summary of our findings and collaborative efforts for 2012 and in some cases 2013*
    1. chesapeakebay.net still provides all the data and information we have always included in our printed report in years past.
2. *Lag times are an issue but long term data shows most of our efforts are well-founded*
3. *We must continue to work at restoring and conserving the Bay's ecosystem's resources AND continue to track responses*

Key Messages on Bay Barometer

1. *Partners are hard at work to continue progress and build resilience.*
    1. BB shows us the restoration data, the health data and some places we are adapting our way of working together based on science (point to illustration – oyster news, striped bass news)
2. *It takes time for results of our work to show up in the measurement of the ecosystem's health.*
    1. There will always be a lag time between putting our restoration efforts in place and seeing improvements in health of the Bay and watershed.

HEALTH message: lag times/sustainability/challenges

Examples

- **Long-term pollution trends** for total nitrogen and phosphorus pollution over the last 25 years show decreases in these pollutants at most monitoring sites.
- **Water Quality:** new method for tracking how well we're meeting water quality standards
  - Brings our tracking in line with how DE, DC, MD & VA report their w.q. info
  - Tracking all indicators (DO, SAV/clarity, Chl *a*) by segment will ultimately allow our scientists to better monitor the Bay's water quality at a more local scale.
- **Crabs:** crab numbers are up for 2012 – good abundance that is between our target and the level at which we'd consider the fishery "overfished"
- **Toxics:** increased since 2010; cause for concern – ¾ of analyzed tidal waters show chemical contaminants
  - We must make better decisions at local and regional levels about how to manage growth and meet people's needs.

RESTORATION: Key Messages

1. Partners continue to make progress and results are visible and tangible.

   Examples: CBP Partners:

   - opened 34 more miles of streams to migrating fish
     - an anticipated dam removal will open 40 more miles on Patapsco
   - increased 285 miles of forest buffers
     - Note for MB: Buffer restoration trends re down from former highs due to federal funding challenges to CREP; this is a potential challenge to jurisdictions that consider forest buffers as major way to meet nutrient reductions
   - created 18 new public access sites
   - reduced pollution from nutrients & sediment

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