



Backgrounder

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Bay Barometer: Summary of Indicators

The Chesapeake Bay Program partners track and report on a wide variety of indicators of Bay and watershed health as well as watershed-wide restoration progress. Our full sets of information and data, as well as charts that can be downloaded as images, are available on our website: chesapeakebay.net at “[Track the Progress](#)”.

A collection of 2012 CBP news stories and embeddable videos related to the Bay Barometer data are offered, too.

Photos and images related to Bay Barometer are available for media on CBP's [Flickr site](#). Please credit Chesapeake Bay Program.

HEALTH

Although there were improvements in some areas of the Bay's health since our last report, most health indicators are down.

[Bay Health - DATA](#)

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 Bay continues to have polluted waters in some areas, 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 2011, there were an estimated 63,074 acres of underwater grasses in the Chesapeake Bay, a decrease of 16,590 acres from 2010.
- Phytoplankton: In 2011, 56 percent of the Bay's surface waters met the phytoplankton goal.
- Bottom Habitat: In 2011, 45 percent of the Bay and its tidal tributaries met the bottom habitat goal.

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 decreased to 97 million in 2012, compared with 194 million in 2011. This is still above the targeted level for a sustainable crab population.
- Oysters: According to 2008 data, there are an estimated 3 billion grams of oyster biomass in the Bay and its tidal tributaries.

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- Striped Bass: Female striped bass spawning stock biomass measured 111 million pounds in 2010, still well above the target of 82 million pounds.
- American Shad: American shad abundance in the Bay in 2010 was 28 percent of the goal.
- Atlantic Menhaden: Since menhaden are considered primarily a coast-wide species, here is no Bay-specific estimate of menhaden population. 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 nutrient and sediment pollution flows to the Bay and its streams, creeks and rivers.

- Dissolved Oxygen: Data from 2009-2011 indicate that 34 percent of the combined open water, deep water and deep channel water volume in the Bay and its tidal tributaries met dissolved oxygen standards during summer.
- Water Clarity: In 2011, 5 percent of the Bay's tidal waters met the water clarity goal.
- Chlorophyll *a*: In 2011, 18 percent of the Bay's tidal waters had chlorophyll *a* concentrations that achieved the goal.
- Chemical Contaminants: Based on 2010 assessments, 28 percent of analyzed tidal waterways had no impairment for chemical contaminants.

[Watershed Health - DATA](#)

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.

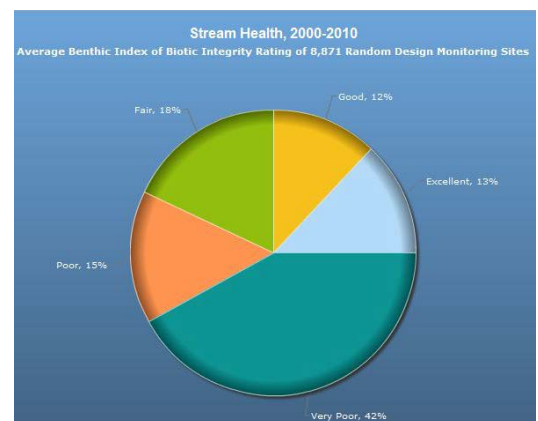
Forest Cover: 58 percent of the Bay watershed is forested, and development is reducing forests at the rate of 100 acres per day.

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. 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. These results show a clear link between the watershed-wide B-IBI scores and land-based activities in individual watersheds.

Of the 8,871 sites included, between 2000 and 2010:

- 13 percent (1,138 sites) were in excellent condition
- 12 percent (1,105 sites) were in good condition
- 18 percent (1,584 sites) were in fair condition
- 15 percent (1,357 sites) were in poor condition
- 42 percent (3,687 sites) were in very poor condition



Visit [website](#) to view a dynamic map, portraying data from 15,112 sites (including the 8,871 random sites and 6,241 targeted-sampling-design sites).

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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:
 - Most monitoring sites show trends indicating decreasing nitrogen concentrations.
- Phosphorus in Rivers Entering Chesapeake Bay: Long-term Flow-adjusted Concentration Trends:
 - Most monitoring sites show trends indicating decreasing phosphorus concentrations.
- Sediment in Rivers Entering Chesapeake Bay: Long-term Flow-adjusted Concentration Trends:
 - Between 1985 and 2010, 10 out of 31 sites showed downward trends, eight sites showed upward trends and 13 sites showed no or small trends that are not statistically significant.

RESTORATION

The Bay Program partnership made progress on many of its restoration goals to reduce pollution, restore habitats, manage fisheries, protect watersheds and foster stewardship.

Reducing Pollution

Computer estimates, calibrated using monitoring data, indicate that between July 2009 and June 2011, as a result of pollution reducing practices implemented:

- Nitrogen loads to the Bay decreased by 15.67 million pounds – 21 percent of the TMDL target
- Phosphorus loads to the Bay decreased by 0.9 million pounds – 19 percent of the TMDL target
- Sediment loads to the Bay decreased 396 million pounds - 30 percent of the TMDL target

Planting Bay Grasses

In 2011, 0.02 acres of bay grasses were planted, bringing the total to 170 acres.

Wetlands Restoration

In 2010, the Habitat Goal Team set a new target to restore 30,000 acres of tidal and non-tidal wetlands in the watershed portions of Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia and the District of Columbia by 2025. Between 2010 and 2011, 3,775 acres of wetlands were established or re-established in the Bay watershed, achieving 13 percent of the outcome. Nearly 15,000 acres were restored between 1998 and 2010.

Reopening Fish Passage

In 2011, 148 miles of fish passage were restored. This brings the total to 2,510 miles, or 88 percent of the goal.

Restoring Oyster Reefs

In 2010, habitat restoration efforts took place on 1,896 acres of oyster reefs. This brings the total acreage treated since 2007 to 4,763. In early 2012, Bay Program partners agreed upon a Bay-wide standard for measuring the success of reef restoration. CBP expects to report on restoration using this new measurement in 2013.

Blue Crab Fishery Management

Based on 2011-2012 winter dredge survey data and estimates of Bay-wide harvest, the Chesapeake Bay spawning-age female blue crab population (97 million) continued at sustainable levels. Harvest was 25%, below the maximum percent of the population that be taken (34 percent).

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Planting Forest Buffers

From September 2010 to August 2011, about 240 miles of forest buffers were planted along the Bay watershed's streams and rivers. A total of 7,479 miles have been planted watershed-wide since 1996. (Prior to 2010, the Chesapeake Bay Program tracked riparian forest buffer planting in Maryland, Pennsylvania and Virginia. In 2010, CBP began including planting data from New York, West Virginia and Delaware.)

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.

Public Access

In 2011, it is estimated that 15 new public access sites were developed. This results in a total of 1,144 existing public access sites throughout the Chesapeake Bay watershed in 2011.

FACTORS Impacting Bay and Watershed Health

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.

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: 2011 was one of the five wettest years on record due to a very wet spring followed by a hurricane and a tropical storm that hit the region in the late summer/early fall of 2011. Annual average river flow to the Bay during the 2011 water year was 73 billion gallons per day.

Pollutants

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

- Nitrogen: Preliminary estimates show that approximately 455 million pounds of nitrogen reached the Bay during the 2011 water year.
- Phosphorus: Preliminary estimates show that approximately 48 million pounds of phosphorus reached the Bay during the 2011 water year.
- Sediment: Preliminary estimates show that approximately 25.8 million tons of sediment reached the Bay during the 2011 water year.

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 2011, 17.5 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.

NEWS & VIDEOS from CBP related to *Bay Barometer* – for use by media

BAY HEALTH

Blue Crabs

Learn the Issues: http://www.chesapeakebay.net/issues/issue/blue_crabs

Bay 101: <https://vimeo.com/25418647>

- Chesapeake Bay blue crab population reaches highest level in nearly 20 years:
http://www.chesapeakebay.net/blog/post/chesapeake_bay_blue_crab_population_reaches_highest_level_in_nearly_20_year
- Blue crabs at sustainable levels:
http://www.chesapeakebay.net/blog/post/blue_crabs_at_sustainable_levels

Striped Bass

Learn the Issues: http://www.chesapeakebay.net/issues/issue/striped_bass

Bay 101: <https://vimeo.com/57573519>

- Striped bass reproduction down in Chesapeake Bay:
http://www.chesapeakebay.net/blog/post/striped_bass_reproduction_down_in_chesapeake_bay

Bay Grasses

Learn the Issues: http://www.chesapeakebay.net/issues/issue/bay_grasses

Bay 101: <https://vimeo.com/14804602>

- Photo Essay: An uncertain future for Tangier watermen:
http://www.chesapeakebay.net/blog/post/an_uncertain_future_for_tangier_watermen
- Chesapeake Bay underwater grasses decrease 21 percent in 2011:
http://www.chesapeakebay.net/blog/post/underwater_bay_grass_acreage_decreases_21_percent_in_2011
- Susquehanna Flats bay grass beds survive late summer hurricanes, rain storms:
http://www.chesapeakebay.net/blog/post/fall_rains_and_hurricanes_no_match_for_susquehanna_flats_grassbeds

Nutrient Pollution and Algae Blooms

Learn the Issues: <http://www.chesapeakebay.net/issues/issue/nutrients>

Bay 101: <https://vimeo.com/39072975>

Related Bay 101: Fish Kills: <https://vimeo.com/44122266>

- From the Field: Finding out what's in the water:
http://www.chesapeakebay.net/blog/post/from_the_field_finding_out_whats_in_the_water
- Pollution trends reflect lag time between restoration efforts, water quality improvement:
http://www.chesapeakebay.net/blog/post/pollution_trends_reflect_lag_time_between_restoration_efforts_water_quality
- Study shows long-term improvements in Bay health:
http://www.chesapeakebay.net/blog/post/study_shows_long_term_improvements_in_bay_health

Water Clarity

Bay 101: <https://vimeo.com/26978885>

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BAY RESTORATION

Fish Passage

- American eel numbers rise after dam removal:
http://www.chesapeakebay.net/blog/post/american_eel_numbers_rise_after_dam_removal

Forests

Learn the Issues: <http://www.chesapeakebay.net/issues/issue/forests>

Bay 101: <https://vimeo.com/17851496>

- New strategy to guide forest restoration across watershed:
http://www.chesapeakebay.net/blog/post/new_strategy_to_guide_forest_restoration_across_watershed
- Fewer incentives, boost in commodity prices mean decline in on-farm forest buffer restoration:
http://www.chesapeakebay.net/blog/post/fewer_incentives_higher_commodity_prices_mean_decline_in_forest_buffer_refo
- Farmers, foresters and citizens celebrated for conserving Chesapeake Bay forests:
http://www.chesapeakebay.net/blog/post/farmers_foresters_and_citizens_conserve_forests

Wetlands

Learn the Issues: <http://www.chesapeakebay.net/issues/issue/wetlands>

- Restored wetlands critical to Bay's health during hurricane season:
http://www.chesapeakebay.net/blog/post/restored_wetlands_critical_to_bays_health_during_hurricane_season
- From the Field: Saving the Eastern Shore's marshes from destructive, invasive nutria:
http://www.chesapeakebay.net/blog/post/saving_the_eastern_shores_marshes_from_destructive_invasive_nutria

Public Access

- National Park Service writes new plan to improve access to Bay watershed:
http://www.chesapeakebay.net/blog/post/national_park_service_works_to_improve_public_access_to_bay_watershed
- New mobile app helps users find, visit hundreds of Bay attractions:
http://www.chesapeakebay.net/blog/post/new_mobile_app_helps_users_find_visit_hundreds_of_chesapeake_bay_attraction

Oyster Restoration

Learn the Issues: <http://www.chesapeakebay.net/issues/issue/oysters>

Bay 101: http://www.chesapeakebay.net/videos/clip/bay_101_oysters

- Maryland partners plant more than 600 million oysters in the Chesapeake Bay:
http://www.chesapeakebay.net/blog/post/maryland_partners_plant_more_than_600_million_oysters_in_the_chesapeake
- Oyster survival rate in Maryland highest in 25 years:
http://www.chesapeakebay.net/blog/post/oyster_survival_rate_in_maryland_highest_in_25_years

Menhaden

Learn the Issues: <http://www.chesapeakebay.net/issues/issue/menhaden>

- Fisheries commission limits menhaden harvest:
http://www.chesapeakebay.net/blog/post/fisheries_commission_limits_menhaden_harvest

The Chesapeake Bay Program is a regional partnership that has coordinated and conducted the restoration of the Chesapeake Bay for 30 years, since its formation in 1983. Partners include the U.S. Environmental Protection Agency; the U.S. Department of Agriculture; the states of Delaware, Maryland, New York, Pennsylvania, Virginia and West Virginia; the District of Columbia; the Chesapeake Bay Commission, a tri-state legislative body; many federal agencies; and advisory groups of citizens, scientists and local government officials.

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