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Health Index

2006 STATE
of the Bay



CHESAPEAKE BAY FOUNDATION
Saving a National Treasure

State of the Bay 2006

Since 1998, the Chesapeake Bay Foundation has issued its annual State of the Bay Report. For the past three years, the report has described a Chesapeake Bay that is languishing, scoring a dismal and unwavering 27 out of 100 on the health index. Despite repeated public commitments from our elected officials at the local, state, and federal levels to reduce pollution and remove the Bay from the nation's list of "dirty waters" by 2010, the pace of restoration has been glacial. At long last, however, there may be reason to believe that the tide is beginning to turn.

This year, the State of the Bay is improved, with a score of 29.

The positive change in this year's health index is due largely to decreased nitrogen and phosphorus pollution and increased levels of dissolved oxygen Bay-wide. Mother Nature was responsible for some of the improvements. The extent of the Bay's "dead zone" (oxygen deprived water) is driven, in part, by the amount of pollution washed into the Bay by spring rains. This year, March and April were among the driest on record and pollutant loads were subsequently reduced.

A portion of the improved scores for nitrogen and phosphorus may also reflect the past years' state efforts to reduce polluted runoff to the Bay and its tributaries. Across the watershed, states have dedicated funding to upgrade sewage treatment plants with pollution-reducing technology and are issuing water pollution discharge permits with limits on nitrogen and phosphorus pollution. Maryland enacted legislation that would reduce air pollution's impact on the Chesapeake. And each of the Bay states has begun to address nitrogen and phosphorus pollution from agricultural sources, increasing their efforts to provide resources to farmers and other landowners to implement on-the-ground conservation practices that reduce polluted runoff to local waterways.

These critical efforts at the state level, combined with a drier than normal spring, provide us with a glimpse at what is possible. The Chesapeake Bay and its rivers and streams are a resilient ecosystem. When we take bold, deliberate action to restore water quality, we will get results. One thing is even more certain, however. The improvement will not sustain itself in the face of continued population growth and its collective environmental impact unless the Chesapeake Bay Tributary Strategies, those scientifically based plans for Bay restoration, are fully implemented, immediately.

Why? Because the Bay is still in critical condition. While the summer dead zone this year was smaller than in recent years, large numbers of beach closures, fish kills, sick fish, and reports of impacts to human health are stark reminders that our waterways remain in crisis. And federal funding cuts to key programs, such as the funding to implement sewage treatment plant upgrades, further compromise restoration efforts.

The Tributary Strategies are roadmaps detailing the actions needed to reduce pollution. They have been developed with broad based buy-in across various geographical segments of the watershed. To date, however, their implementation has been woefully inadequate. With less than four years until the 2010 deadline, funding and programs are in place to achieve only about one-third of the region's Chesapeake 2000 Agreement pollution reduction commitments.

























In the next year, elected officials at the state and federal levels must fund programs that accelerate the rate of implementation of efforts to assist agriculture in achieving the pollution reduction goals outlined in the Tributary Strategies and to finish the job on committing to upgrade the region's sewage treatment facilities. Additionally, state and local governments must work cooperatively to stop poorly planned growth, which replaces forest and farm land with sprawling developments.

This year's score indicates modest but meaningful progress in the fight to save the Bay and its rivers and streams. While this year's report reflects improvement, we must not mistake this incremental success for the end result. Rather, we must intensify our collective commitment to restore the Bay by 2010. Anything less will constitute an admission of failure.



Massive sediment runoff throughout the watershed following heavy June rains underscores the need to increase efforts to reduce pollution.

State of the Bay in 2006

POLLUTION	 F/D  <small>N Score=17 P Score=29</small>	 F  Score=15
	 F  Score=16	 D  Score=27
HABITAT	 B+  Score=56	 F  Score=18
	 C+  Score=42	 D  Score=29
FISHERIES	 A+  Score=71	 F  Score=4
	 C  Score=38	 F  Score=10

29

- A** EXCELLENT
- B** GOOD
- C** FAIR
- D** POOR
- F** CRITICAL



F 17 ↑

Nitrogen

+4 from 2005

D 29 ↑

Phosphorus

+9 from 2005

Increased scores for the Bay’s two primary pollutants, nitrogen and phosphorus, are due in part to a very dry spring. In a typical year, heavy spring rains wash these pollutants into tributaries and the Bay, where they fuel enormous summertime algal blooms resulting in dead zones (oxygen deprived waters) unable to support a healthy ecosystem. This March and April were among the driest on record in some areas; consequently, pollutant loads, which are highly correlated with river flows, were reduced.

It may be, too, that we are starting to see the benefits of Bay restoration efforts. Bay states have begun to address nitrogen and phosphorus pollution from agriculture through practices such as planting pollution-absorbing winter cover crops, restoring riparian buffers, and implementing nutrient management plans. Pollutant loads from point sources like sewage treatment plants are gradually being reduced by instituting permit limits and upgrading plants with available pollution reduction technologies. It is too soon to tell, but perhaps this improvement is a glimmer of what’s to come if we sustain and accelerate our efforts to reduce flow of these pollutants into the Bay and its tributaries.



F 16 ↑

Dissolved Oxygen

+4 from 2005

During the summer of 2006, the volume of the Bay with little or no oxygen—the dead zone—was smaller than in the previous several years, reflecting the dependency of this indicator on nitrogen and phosphorus pollution, which improved. Though still a far cry from suggesting a “healthy” ecosystem, this year’s score of 16 reflects a marked improvement in Bay water quality compared to the last couple of years.

Nitrogen and phosphorus pollution contribute to the Bay’s dead zone by fueling massive algae blooms that use large amounts of the Bay’s precious oxygen when they die and decompose. The springtime loads of these pollutants were lower than normal this year due, primarily, to a very dry spring. The most important key to Bay restoration is to implement on-the-ground practices that will reduce this pollution, making the Bay’s water quality less dependent on the weather.



F 15 ↔

Water Clarity

no change from 2005

Improving water clarity is the key to restoring the Bay’s lush and productive underwater grass beds. Without sufficient sunlight, these underwater plants are unable to grow and survive. Unfortunately, water clarity in the Bay and its tributaries has shown little, if any, overall improvement and is still far below what is needed to support healthy underwater plant communities.

Poor water clarity is caused by sediment, algae, and other particles suspended in the water column. Water clarity in much of the Bay was above average in April and May, largely due to the low amount of rain and runoff. But that changed when drenching rains from summer storms sent dirt from construction sites, agricultural lands, and eroding streambanks into the many streams and rivers that feed the Bay. To improve water clarity we must protect and restore riparian buffers, enforce existing regulations to limit stormwater runoff, and implement agricultural practices such as conservation tillage that will minimize soil losses.



D 27 ↔

Toxics

no change from 2005

The reported release of toxic chemicals by industry directly into surface waters in the Chesapeake Bay watershed has changed little from last year. However, recent studies have found that a large proportion of smallmouth and largemouth bass in the Potomac River basin are “intersex,” exhibiting both male and female characteristics, highlighting the ongoing threat posed by waterborne contaminants. The cause is unknown, but is likely due to chemicals known as “endocrine disruptors”—many of which are not typically measured or monitored—that cause reproductive abnormalities in fish and other aquatic animals.

Throughout the watershed, fish consumption advisories for mercury and PCBs remain in place, but efforts targeted at reducing mercury emissions may bring future benefits. Most of the mercury in waterways and fish comes from air pollution. CBF and others are pursuing legal action against EPA to achieve more stringent national standards for mercury emissions from coal-fired power plants, and the Maryland Healthy Air Act will reduce the emissions of several pollutants, including mercury, from power plants.



B+

56



Riparian Forest Buffers

+ 1 from 2005

Restoration of forested riparian buffers in the Bay region has accelerated in the last few years. With Pennsylvania leading the way, the Bay states installed more than 800 miles of forested buffers in 2005. Restoration success is largely due to the Conservation Reserve Enhancement Program, which provides farmers the resources to establish conservation projects such as riparian buffers.

We must temper our optimism. As of 2005, the region had planted only about 10 percent of the 50,000 mile goal established in the Tributary Strategies. The vast majority of existing buffers lack permanent protection, and experts warn that it will be increasingly hard to maintain the momentum for buffer restoration due to reductions in on-the-ground state field staff to market these programs. To sustain progress in restoring and protecting these critical pollution filters, new incentives and approaches must be developed to encourage landowner participation, enhance our capability to provide adequate technical assistance, and diligently enforce programs that protect riparian lands.



C+

42



Wetlands

no change from 2005

Restoration of the Chesapeake relies on re-creation of some of the more than two million acres of historic wetlands that have been destroyed or degraded since 1607. Between 1998 and 2004, Maryland, Pennsylvania, Virginia, and the District of Columbia created approximately 10,000 acres of wetlands. However, Bay states have committed to restoring well over 100,000 acres by 2010 as part of their Tributary Strategy water quality goals, so they still have a very long way to go.

Wetland protection through regulation and enforcement is also critical. Unfortunately, a recent U.S. Supreme Court decision and proposed changes to federal regulations dealing with wetland permitting may make protecting and preserving these valuable habitats and important natural filter systems even more difficult in the future. In addition, hundreds of acres of wetland continue to be threatened by large construction projects. For example, the King William Reservoir in Virginia, and the Intercounty Connector, a major highway project in Maryland, would result in the destruction of almost 500 acres of wetland habitat combined.



F

18



Underwater Grasses

-2 from 2005

The Chesapeake Bay partners committed to restoring 185,000 acres of underwater grasses by 2010. In 2005, they had achieved approximately 42 percent of that goal. The decrease in score for 2006 is primarily due to the lingering effects of defoliation of eelgrass in the middle and lower Bay at the end of summer in 2005. Grass beds in areas such as Mobjack Bay, the Poquoson Flats, and the Piankatank River experienced severe die-offs attributed to high water temperatures. Evidence indicates grasses are less dense in this region, but are slowly recovering.

In the upper Bay and Susquehanna Flats, underwater grass beds were abundant and diverse, despite a potential knock-out blow from the torrential rains that drenched the Bay region in late June and early July. These rains sent a cloudy plume of sediment down the Susquehanna and other Bay rivers that shaded the grasses during this important growth period. Late summer surveys, however, indicate these grass beds survived this onslaught more or less intact.



D

29



Resource Lands

no change from 2005

Well-managed farmland, pollution-absorbing forests, tree-buffered stream valleys, and filtering wetlands remain under high threat to uncontrolled development. New development continues to gobble open land at a prodigious pace. Recent estimates are that we are losing more than 90,000 acres of forests and farmland per year (275 acres each day) in the watershed.

State preservation efforts are offsetting some of these losses. Pennsylvania's farmland preservation program has increased the acreage under its protection, Maryland fully funded its land conservation program (Program Open Space), and Virginia announced a 400,000 acre conservation goal. However, absent state and local public policy changes to better manage and direct growth, losses of open space, farmland, and forests will continue.



A+

71



Rockfish

no change from 2005

Rockfish (striped bass) continue to be at near historic high levels in Chesapeake Bay. In 2006, Maryland's juvenile survey did indicate a slight drop in reproduction, but experts believe this decrease reflects natural variability, and overall the spawning potential of the population remains high. The consistent good reproduction of rockfish since the early 1990s is a testament to the benefits of the strict fisheries conservation practices over the last twenty years.

However, there are disturbing signs that the Chesapeake, in its current ecological state, can no longer support such high numbers of rockfish. Scientists are working to understand why a majority of the Bay's rockfish are suffering from disease. Early results suggest that low numbers of their favorite food fish, menhaden, and poor water quality are responsible. This year, for the first time, limits have been placed on the industrial harvesting of menhaden from the Chesapeake Bay.



C

38



Blue Crabs

no change from 2005

The Bay's blue crab population remains stable at a low level. The decline of the 1990s has leveled off, but the population is well below the long term average. In 2000, the Bi-State Blue Crab Advisory Committee (BBCAC) set harvest targets to increase the population, and management measures put in place by the states from 2001 to 2003 may be helping. For the first time, the harvest has remained below the targets, and if that continues the number of reproducing females will double over the next few years. The BBCAC, however, was disbanded. To ensure the increase in spawning stock is achieved, BBCAC should be reconvened.

In addition to harvesting pressure, habitat continues to be a severe limiting factor for blue crabs. Widespread loss of lower Bay eelgrass in 2005 may well have reduced the survival of juvenile crabs, as indicated by the poor catch of peeler crabs in 2006. Low dissolved oxygen continues to crowd crabs into shallow water where they are more vulnerable to harvest and predation. Crabs are unlikely to rebound without increases in underwater grasses and better water quality.



F

4



Oysters

+1 from 2005

The Bay's oysters are slightly better off than they were a year ago, although they remain the lowest score among our indicators. Restoration programs continue to show steady progress. A new record was set in 2006, with the planting of over 300 million hatchery-produced oysters in the Bay and its tributaries. In addition, the oyster harvest was up dramatically from the year before and set recent records in both Maryland and Virginia.

Disease still hampers oyster recovery, however, and harmful algal blooms and low dissolved oxygen levels are of growing concern. Above average salinity in 2006 brought about an increase in disease-related mortality in parts of the lower Bay, particularly in the James River. The upside of high salinity is that it stimulates oyster reproduction; this was particularly evident in the Great Wicomico and Lynnhaven Rivers where "spat-sets" (the setting of baby oysters on hard surfaces) were good. Targeted restoration efforts in these tributaries no doubt contributed to these results. The ongoing challenge is to improve water quality and increase the pace of restoration efforts sufficiently to stimulate reproduction to levels that overcome losses from disease.



F

10



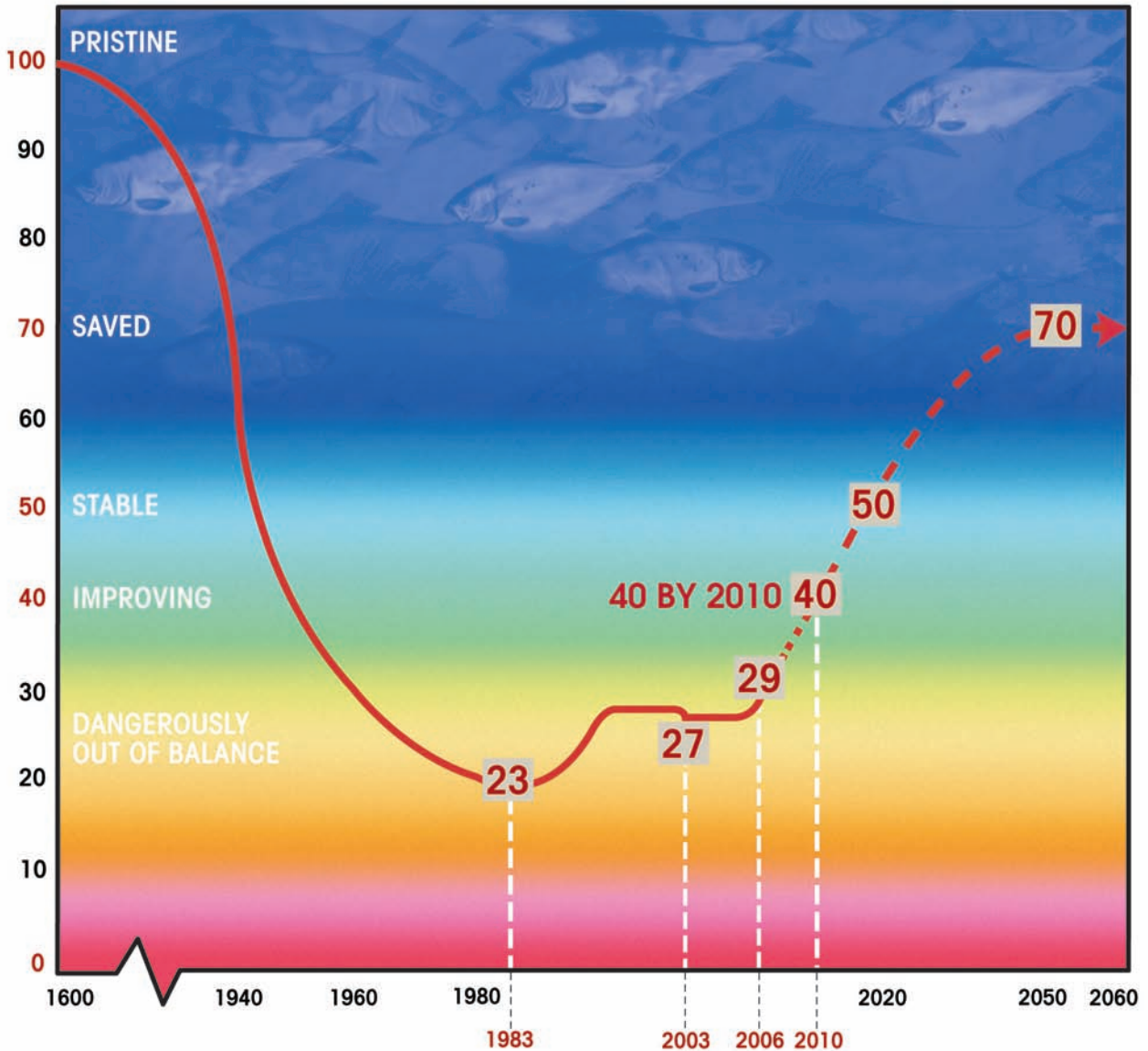
Shad

- 1 from 2005

Shad runs (numbers of adult spawning fish) in Chesapeake tributaries were weak in the spring of 2006 and may be indicating a downward trend. Virginia runs were the lowest since 1998, and the York River run, once the most stable in the state, continues to drop. Perhaps most troubling, in the Susquehanna where the run had increased steadily throughout the 1990s, numbers declined for the third year in a row. There is also increasing concern that fish passages put into place on the river's four hydroelectric dams are insufficient to allow full recovery.

In addition, studies showed that fewer numbers of shad returning to the Susquehanna were spawned in the wild and more were of hatchery origin, further indicating that the recovery of shad on that key river has reversed. While low numbers of returning adult shad meant fewer eggs spawned in 2006, the eggs collected for hatcheries were in good condition, raising hope that wild reproduction could still be moderately successful.

The Chesapeake Bay Remains Dangerously Out of Balance



The health of the Chesapeake Bay is dangerously out of balance and has been for over four decades. This lack of progress in more than 30 years is especially staggering in the context of the public resources and attention focused on Bay health during this time. Clearly, what public officials have done to date is far from enough. Now is the time to hold government accountable for its failure to significantly reduce pollution, remove the Bay from the nation's list of "dirty waters," and restore our national treasure.



CHESAPEAKE BAY FOUNDATION

Saving a National Treasure

How We Create Our Report

The State of the Bay Report is based on the best available information about the Chesapeake for indicators representing three major categories: pollution, habitat, and fisheries. Monitoring data serve as the primary foundation for the report, supplemented by in-the-field observations.

We measure the current state of the Bay against the healthiest Chesapeake we can describe—the Bay Captain John Smith depicted in his exploration narratives from the early 1600s, a theoretical 100.

Our number scores correlate with letter grades as follows:

70 or better	A+
60–69	A
50–59	B+
45–49	B
40–44	C+
35–39	C
30–34	D+
25–29	D
20–25	D-
Below 20	F

ABOUT THE COVER:

The clock is ticking. In 2000, the Chesapeake Bay region's leaders committed to reduce pollution sufficiently to have the Bay removed from the nation's 'dirty waters' list by 2010. At current levels of funding and implementation this goal will not be achieved.

PHOTO CREDITS:

page 2: Satellite image from July 2, 2006 courtesy of NASA, MODIS Rapid Response at GSFC.

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CHESAPEAKE BAY WATERSHED



The Chesapeake Bay's 64,000 square mile watershed covers parts of six states and is home to more than 16 million people.



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