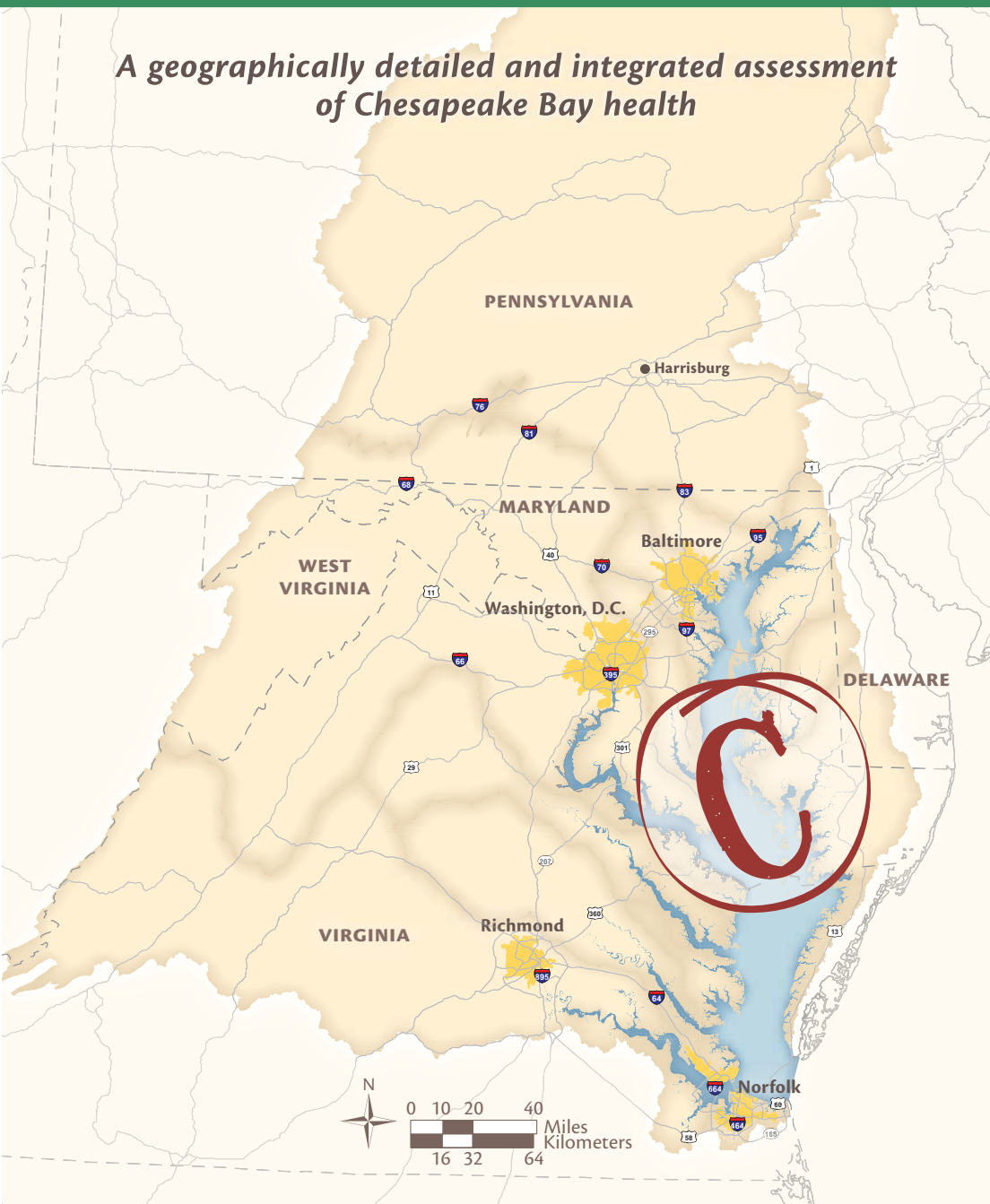


Chesapeake Bay

REPORT CARD

2009

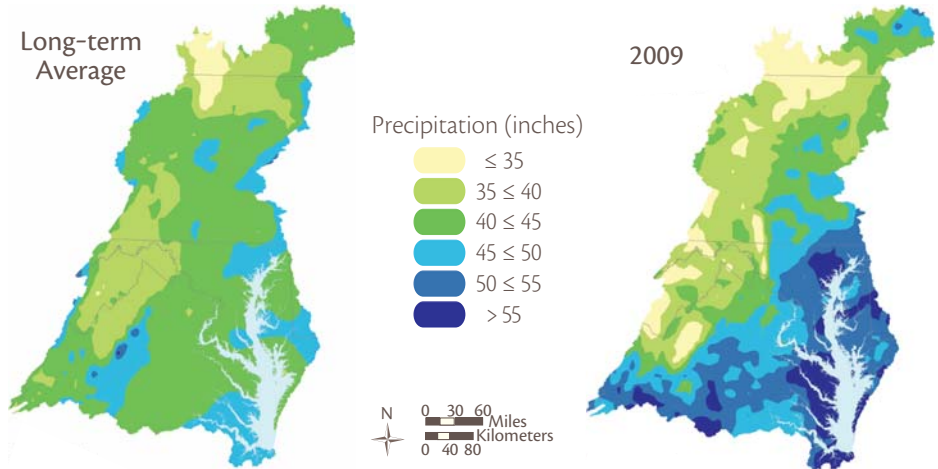
A geographically detailed and integrated assessment of Chesapeake Bay health



Improved health of Chesapeake Bay in 2009

The overall health of Chesapeake Bay, assessed using water quality and biotic indicators, was the best it has been since 2002. The overall grade improved from C- in 2008 to C in 2009. Eight reporting regions had improved grades in 2009, four were unchanged, and two had slightly worse grades. The highest ranked region, for the third year in a row, was the Upper Western Shore (B-), while the lowest ranked region this year was the Patapsco and Back Rivers (F).

2009 precipitation pattern provides insights about Bay health



Above left: A map of normal average precipitation for 1971–2000 shows precipitation distribution over the Bay watershed. Above right: In 2009, increased precipitation was highly concentrated in the tidal areas of the watershed. Data: NOAA's National Weather Service

The unique precipitation (rain, snow, and ice) pattern seen in 2009 provides insights into the relative roles of nutrient and sediment inputs, which affect Bay health, from the Susquehanna River versus the smaller tributaries in Maryland and Virginia. Pennsylvania and New York received relatively low amounts of precipitation in 2009, while tributaries adjacent to the Bay received unusually high levels of precipitation (see figure). This most likely led to decreased inputs from the Susquehanna River and higher inputs from the tributaries in Maryland and Virginia. The mainstem portion of the Bay tends to be more strongly influenced by flow from the Susquehanna than from other tributaries, and in 2009 the Mid Bay (D+ in 2008; C in 2009) and Lower Bay (C- in 2008; C in 2009) mainstem regions appeared to respond positively to the decreased Susquehanna flow. The improvements in 2009 overall Bay health likely reflect the improvements in the Mid and Lower Bay scores, which are the Bay's two largest reporting regions.

Water clarity improves in 2009

An encouraging sign for the Bay's health was an improvement in water clarity. Following a long-term trend of declining water clarity throughout the Bay, the last two to three years have seen improvement, especially in the average increase in Bay-wide water clarity of 12% in 2009. The water clarity improvements were most dramatic in the middle regions of the Bay, including the mainstem, Choptank, Potomac, and Rappahannock Rivers. However, the reporting regions with chronically poor water clarity, the Patapsco and Back Rivers, Lower Western Shore of Maryland, York River, and Elizabeth River, still had poor water clarity.

Western shore tributaries

Upper Western Shore

B-

Moderate-good ecosystem health—highest ranked region for the third year in a row. Very good dissolved oxygen. Aquatic grasses remained steady at healthy levels despite poor water clarity.

Patapsco and Back Rivers

F

Very poor ecosystem health—lowest ranked region in the Bay. Continued decline of dissolved oxygen, chlorophyll *a*, and water clarity scores. Biotic indicators are slowly improving.

Lower Western Shore (MD)

D-

Poor ecosystem health. Improved dissolved oxygen and chlorophyll *a* conditions. Although benthic community condition improved, overall biotic health continues to be poor.

Patuxent River

D-

Poor ecosystem health. No improvement in overall health of this region despite a slight improvement in dissolved oxygen. Most health indicators remain consistently poor.

Potomac River

C

Moderate ecosystem health. Slight improvement in overall health due to improvements in chlorophyll *a*, water clarity, and benthic and phytoplankton community conditions.

Rappahannock River

C

Moderate ecosystem health. Continued improvement in overall health due to improvements in water clarity and aquatic grasses. Declines in dissolved oxygen and phytoplankton.

York River

D

Poor ecosystem health. Overall health is slightly better for second year in a row. Water quality indicators continue to be poor, while benthic community condition improved significantly.

James River

C-

Moderate-poor ecosystem health. Aquatic grasses continue to improve, however, chlorophyll *a* scores declined slightly. This region hovers around the border of moderate to moderate-poor health.

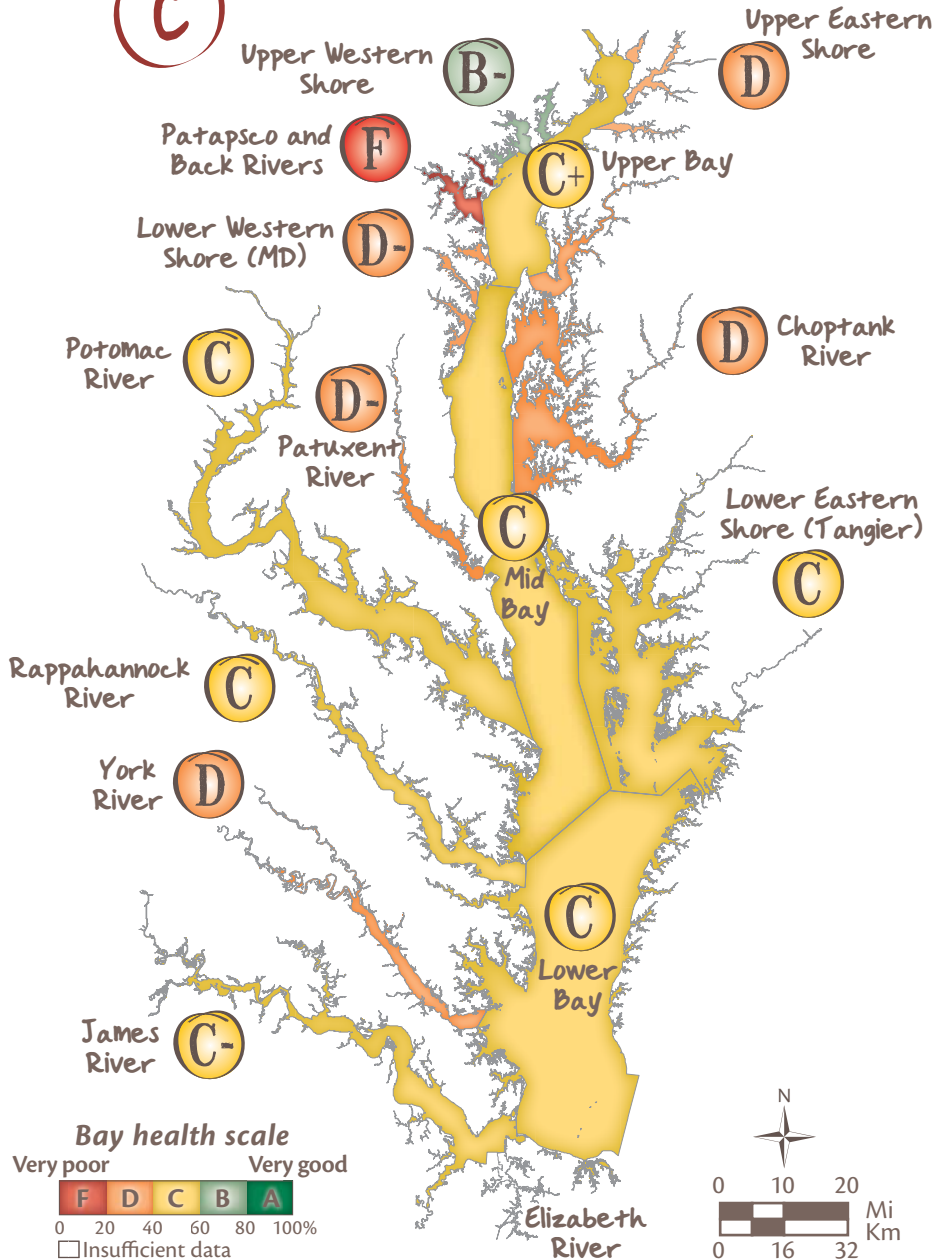
Elizabeth River

Incomplete assessment. Water quality indicators show no signs of improvement. Phytoplankton community condition continues to be very poor with a 0% for three years in a row.

CHESAPEAKE BAY 2009 REPORT CARD

Overall score:

C



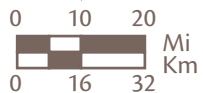
Bay health scale

Very poor Very good



0 20 40 60 80 100%

□ Insufficient data



Eastern shore tributaries and mainstem Bay

Upper Eastern Shore

D

Poor ecosystem health. While still poor, the overall health of this region improved for the first time in five years. The scores for all six indicators showed improvement.

Upper Bay

C+

Moderate ecosystem health. Overall health is the same as last year. Aquatic grasses remained steady at healthy levels after several years of improvement.

Choptank River

D

Poor ecosystem health. Overall health improved slightly, but is still poor. Improvements in water clarity, and benthic and phytoplankton community conditions.

Mid Bay

C

Moderate ecosystem health. Improvement in overall health. Aquatic grasses, dissolved oxygen, chlorophyll *a*, and water clarity scores all showed improvement this year.

Lower Eastern Shore (Tangier)

C

Moderate ecosystem health. Water clarity score is the highest since first year of monitoring in 1986, although still considered poor. Aquatic grasses score increased for the third year in a row.

Lower Bay

C

Moderate ecosystem health. Large improvements in water clarity and benthic and phytoplankton community condition led to highest overall health score in eight years.

Indicators used in the report card

The aim of this report card is to provide a transparent, timely, and geographically detailed assessment of 2009 Chesapeake Bay health. Chesapeake Bay health is defined as the progress of **three water quality indicators** (chlorophyll *a*, dissolved oxygen, and water clarity) and **three biotic indicators** (aquatic grasses, phytoplankton community, and benthic community) toward scientifically derived ecological thresholds or goals. The six indicators are combined into one overarching Bay Health Index, which is presented as the report card overall score. Detailed methods available at www.eco-check.org/reportcard/chesapeake/.



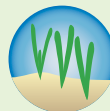
Chlorophyll *a*



Dissolved oxygen



Water clarity



Aquatic grasses



Phytoplankton community



Benthic community

What do the grades mean?



All water quality and biological health indicators meet desired levels. Quality of water in these locations tends to be very good, most often leading to very good habitat conditions for fish and shellfish.



Most water quality and biological health indicators meet desired levels. Quality of water in these locations tends to be good, often leading to good habitat conditions for fish and shellfish.



There is a mix of good and poor levels of water quality and biological health indicators. Quality of water in these locations tends to be fair, leading to fair habitat conditions for fish and shellfish.



Some or few water quality and biological health indicators meet desired levels. Quality of water in these locations tends to be poor, often leading to poor habitat conditions for fish and shellfish.



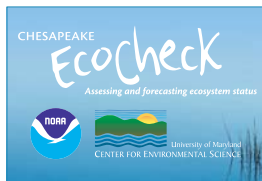
Very few or no water quality and biological health indicators meet desired levels. Quality of water in these locations tends to be very poor, most often leading to very poor habitat conditions for fish and shellfish.

ACKNOWLEDGEMENTS

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