2006

Chesapeake Bay
REPORT CARD

A geographically detailed and integrated assessment
of Chesapeake Bay habitat health

2006 AT A GLANCE

An overview of Chesapeake Bay habitat health

A year of weather extremes

Although total freshwater flows into the Bay were close to average in 2006, the year was characterized by extremes in flow with a very dry spring period and an intense summer rain event.

A difficult year for habitat health

The habitat health values were generally poor overall in 2006, but did vary from region to region. The Upper Bay had the best score (55%), and the Patapsco River had the worst score (13%).

Poor water clarity

The Bay was extremely turbid in 2006, with the worst Bay-wide water clarity assessment since water clarity monitoring started in 1985. The exact causes for the degrading water clarity are not well understood.

Dramatic reduction in bay grasses

The area covered by bay grass (submerged aquatic vegetation) decreased throughout most regions of the Bay, in spite of some recent resurgence in the Upper Bay. Reasons for the decrease include high water temperatures in late 2005, dry spring conditions, and poor water clarity resulting from the summer rain event.

Very poor benthic community condition

The clams, worms, and other organisms that live on the bottom (benthic community) were in one of the worst conditions since Bay-wide benthic community monitoring began in 1996. Benthic organisms could be responding to low dissolved oxygen concentrations and abundant suspended particles.

A helping hand from Hurricane Ernesto

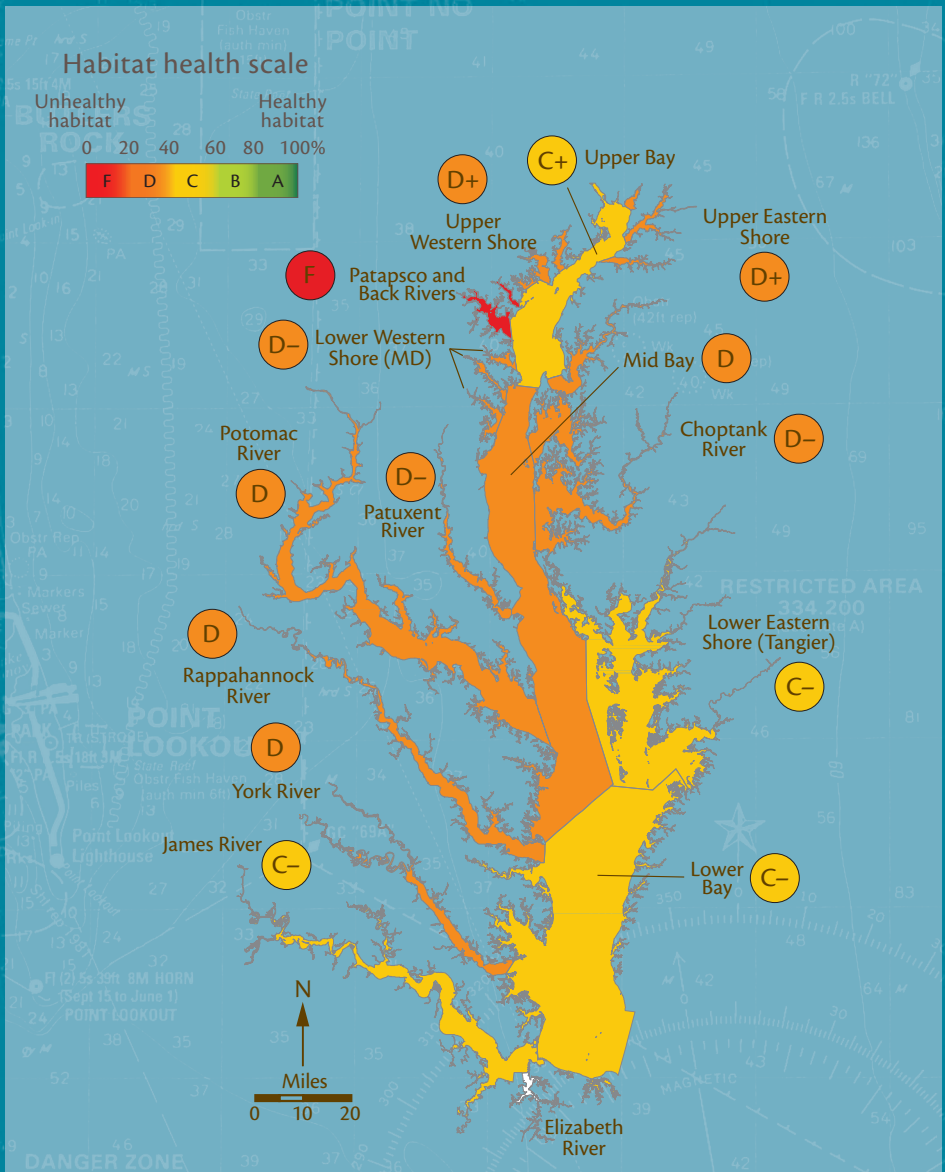
Remnants of Hurricane Ernesto ended the Potomac River harmful algal bloom, and the resulting mixing/cooling reduced the thermal stress on bay grasses and curtailed the low dissolved oxygen conditions in bottom waters in the mainstem Bay.

CHESAPEAKE BAY 2006 REPORT CARD

Scores based on the Bay Habitat Health Index

WESTERN SHORE TRIBUTARIES

REGION	SCORE (%)	COMMENTS
Upper Western Shore	38	**Mid-ranked grade: D+** • Best dissolved oxygen score, but very poor water clarity and poor chlorophyll *a*. • Significant bay grass losses and poor benthic community. No phytoplankton data.
Patapsco and Back Rivers	13	**Worst grade: F** • Very poor water clarity, chlorophyll *a*, and moderate dissolved oxygen scores. • Very poor benthic and phytoplankton communities and loss of bay grasses.
Lower Western Shore (MD)	21	**Bottom-ranked grade: D–** • Lowest Water Quality Index due to very poor water clarity, chlorophyll *a* and moderate dissolved oxygen scores. • Very poor benthic community and poor bay grass score. No phytoplankton community data.
Patuxent River	23	**Bottom-ranked grade: D–** • Very poor water clarity and chlorophyll *a*, and moderate dissolved oxygen. • Poor benthic and phytoplankton scores and loss of bay grasses.
Potomac River	32	**Mid-ranked grade: D** • Very poor water clarity and poor chlorophyll *a* scores. • Very poor benthic and phytoplankton communities, but moderate bay grass score.
Rappahannock River	32	**Mid-ranked grade: D** • Very poor water clarity and poor chlorophyll *a*, but good dissolved oxygen. • Poor benthic and phytoplankton community and bay grass scores.
York River	28	**Mid-ranked grade: D** • Very poor water clarity and poor chlorophyll *a*, but good dissolved oxygen. • Poor benthic community and very poor phytoplankton community and bay grasses.
James River	42	**Top-ranked grade: C–** • Second best Water Quality Index due to very good dissolved oxygen and moderate chlorophyll *a* scores. • Very poor phytoplankton community score and moderate benthic community score.
Elizabeth River	42*	**Incomplete assessment** *(*score based on only 4 of 6 indicators)* • Very poor water clarity, moderate chlorophyll *a* and moderate-good dissolved oxygen scores. • Moderate phytoplankton community score, but no data on benthic community and no growth zone for bay grasses.



CHESAPEAKE BAY

REGION	SCORE (%)	COMMENTS
Overall Bay	37	**Overall average grade for Chesapeake Bay: D+** • Poor Water Quality Index due to very poor water clarity, poor chlorophyll *a* and good dissolved oxygen, except in the deep channels. • Poor Biotic Index due to moderate benthic community, and poor phytoplankton community and bay grass scores.

EASTERN SHORE TRIBUTARIES

REGION	SCORE (%)	COMMENTS
Upper Eastern Shore	35	**Mid-ranked grade: D+** • Very poor water clarity and poor chlorophyll *a* but good dissolved oxygen score. • Moderate-poor benthic community and significant bay grass losses. No phytoplankton data.
Choptank River	21	**Bottom-ranked grade: D –** • Very poor clarity and chlorophyll *a* scores but relatively good dissolved oxygen score. • Second worst Biotic Index due to poor benthic and phytoplankton community scores and bay grass losses.
Lower Eastern Shore (Tangier)	45	**Top-ranked grade: C –** • Moderate Water Quality Index in Tangier Sound, but quality deteriorates within the tributaries. • Good benthic community score, poor bay grass score.

MAINSTEM BAY

Upper Bay	55	**Highest grade: C+** • Best Water Quality Index due to highest clarity and chlorophyll *a* scores. Some poor dissolved oxygen in the deep channel near the Bay Bridge. • Best Biotic Index in the Bay due to highest benthic and bay grass scores and moderate-poor phytoplankton community score.
Mid Bay	29	**Mid-ranked grade: D** • Very poor water clarity and chlorophyll *a* scores. Poor deep channel dissolved oxygen score. • Moderate phytoplankton but poor benthic community.
Lower Bay	41	**Top-ranked grade: C –** • Very poor water clarity and chlorophyll *a* scores. • Second best Biotic Index due to good benthic and moderate phytoplankton communities scores.

Water Quality Index, Biotic Index, and Bay Habitat Health Index Scores

	Patapsco and Back Rivers	Choptank River	Lower Western Shore (MD)	Patuxent River	York River	Mid Bay	Potomac River	Rappahannock River	Upper Eastern Shore	Upper Western Shore	Lower Bay	James River	Lower Eastern Shore (Tangier)	Upper Bay	Elizabeth River*
Water Quality Index	17	32	16	28	34	32	39	37	34	45	37	52	44	56	35
Biotic Index	9	9	25	18	21	26	24	27	35	31	45	32	45	55	50
Bay Habitat Health Index	**13**	**21**	**21**	**23**	**28**	**29**	**32**	**32**	**35**	**38**	**41**	**42**	**45**	**55**	**42***

*(*score based on only 4 of 6 indicators)*

The aim of this report card is to provide a transparent, timely, and geographically detailed assessment of 2006 Chesapeake Bay habitat health. Habitat health is defined as the progress of three water quality indicators (chlorophyll a, dissolved oxygen, and water clarity) and three biotic indicators (bay grasses, benthic community, and phytoplankton community) towards scientifically derived ecological thresholds or goals. The six indicators are combined into a single overarching Bay Habitat Health Index which is presented as the report card score.

ACKNOWLEDGMENTS

The data and methods underpinning this report card represent the collective effort of many individuals and organizations working within the Chesapeake Bay scientific and management community. The following organizations are acknowledged for their significant contributions to the development of the report card: Chesapeake Bay Program, University of Maryland Center for Environmental Science, National Oceanic and Atmospheric Administration, Maryland Department of Natural Resources, Virginia Department of Environmental Quality, Virginia Institute of Marine Science, Versar Incorporated, Environmental Protection Agency, Maryland Department of the Environment, Interstate Commission on the Potomac River Basin, Old Dominion University, and Morgan State University.

While acknowledging the critical role of these organizations in generating, analyzing, and reviewing the data, the Integration and Application Network, University of Maryland Center for Environmental Science and EcoCheck (NOAA-UMCES Partnership) are responsible for the report card release.

More report card information located at the following web site:
www.eco-check.org/reportcard/chesapeake/

Integration & Application Network

CHESAPEAKE EcoCheck
Assessing and forecasting ecosystem status
NOAA
University of Maryland Center for Environmental Science

www.ian.umces.edu www.eco-check.org

Published April, 2007

FSC Recycled