# Maryland Coastal Bays
Report Card

2019–2020

C+

Overall health for the Coastal Bays declined

Coastal Bays health is defined as the progress of **four water quality indicators** (nitrogen, phosphorus, chlorophyll *a*, dissolved oxygen) and **two biotic indicators** (seagrass, hard clams) toward scientifically derived ecological thresholds or goals. The Coastal Bays had an overall score of **C+** for the combined 2019 and 2020 reporting cycle*, a slight decline from 2018, the last year data for all indicators were available for a complete analysis. The main reason for the decline was due to decreased seagrass abundance and mixed hard clam results. The total phosphorus score remained moderate; however the total nitrogen score improved from 2018.

Nitrogen is often a limiting factor in plant growth, but excess nitrogen can cause algal blooms.

Dissolved oxygen (DO) is vital for the survival of animal species such as crabs, fishes, and molluscs.

Similar to nitrogen, **phosphorus** can limit plant growth if it is not abundant enough, or it can cause algal blooms when in excess.
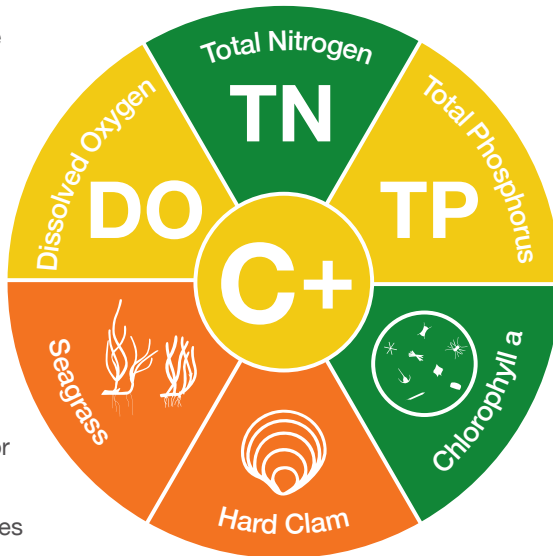
Seagrass growth is another indicator of water quality. Seagrasses are sensitive to changes in water quality.

Chlorophyll *a* is a measure of the amount of algae in the water. High chlorophyll indicates poor water quality (seagrass shading and possible dead zones).

Because they are filter feeders, **hard clams** are good indicator species: species whose health reflects the health of the ecosystem.

What do the scores mean?

81–100% very good	61–80% good	41–60% moderate	21–40% poor	0–20% very poor

*Water quality and hard clam data are from 2019. Seagrass data are from 2020.

Gold star partnerships promote educational and outreach programs across the region

Without the assistance of our friends, students, partners, and visitors, the Maryland Coastal Bays Program (MCBP) would not be able to accomplish our important goals.

The Youth Environmental Action Summit, a community project from the Ward Museum of Wildfowl Art, connected and empowered youth from around Maryland's Lower Shore to explore and to take action across local environmental issues.

In 2019, Audubon Maryland-DC released the inaugural Maryland Coastal Bays Colonial Waterbird and Islands Report. The report, using data collected by Maryland Department of Natural Resources, gives an assessment on the status of colonial waterbird breeding in the Coastal Bays.

Students spend the day exploring and learning about the lower shore.

Through a collaboration with the Town of Berlin, EA Engineering, and MCBP, an old electrical transfer station in Berlin was converted to a sand-gravel wetland to collect stormwater and improve water quality in the Coastal Bays.

Staff from the Chesapeake Bay National Estuarine Research Reserve Maryland provided expertise and assistance in installing surface elevation tables to monitor tidal wetland elevation change in the northern portion of the Coastal Bays.

New sand-gravel wetland in Berlin designed to improve water quality.

Local resident, John Collins, worked to restore a portion of tidal saltmarsh in Sinepuxent Bay that was rapidly degrading. John used material from a nearby canal and native wetland plants to improve the resiliency of the area.

The Protectors of the St. Martin River worked to improve the health of the St. Martin River by growing oysters, providing assistance to MCBP's oyster gardening program, and donating oysters for use at MCBP's restoration sites.

*Protectors of the St. Martin River assess farmed oysters on the dock.*

Tracking emergent harmful algal bloom species of concern

Harmful algal blooms (HABs) have increased in abundance and severity around the world in recent decades, which is due to a combination of increased nutrients and climate change, including increased water temperature.

Harmful algal blooms occur when specific algae grow that are either toxic, cause low oxygen, or are poor food quality for the food web, all of which can be potentially harmful to the ecosystem and human health.

Inputs of nutrients from the land around the Coastal Bays can potentially fuel the growth of these species, which in turn can enter the Coastal Bays from offshore.

While water quality research in the Coastal Bays is sizable, less research occurs in the coastal waters offshore of the bays. Five research cruises occurred in 2018 and 2019 to investigate nutrients and HAB species of concern such as *Dinophysis, Karenia,* and *Pseudo-nitzschia.*
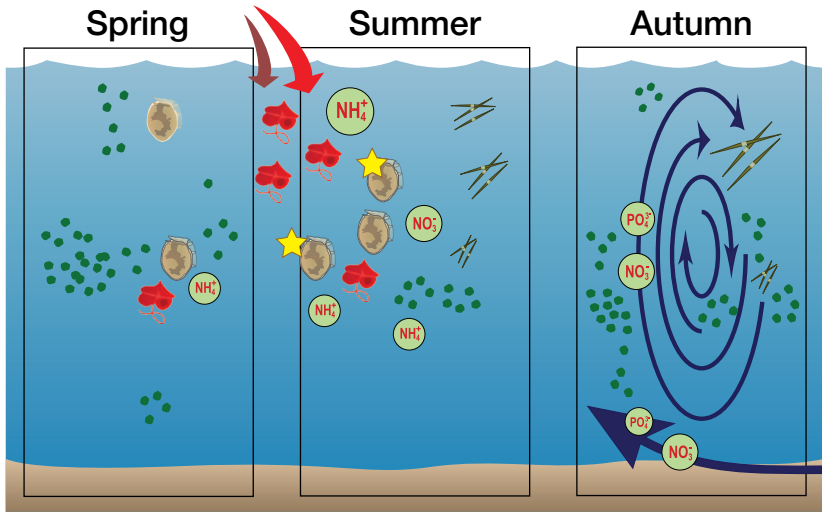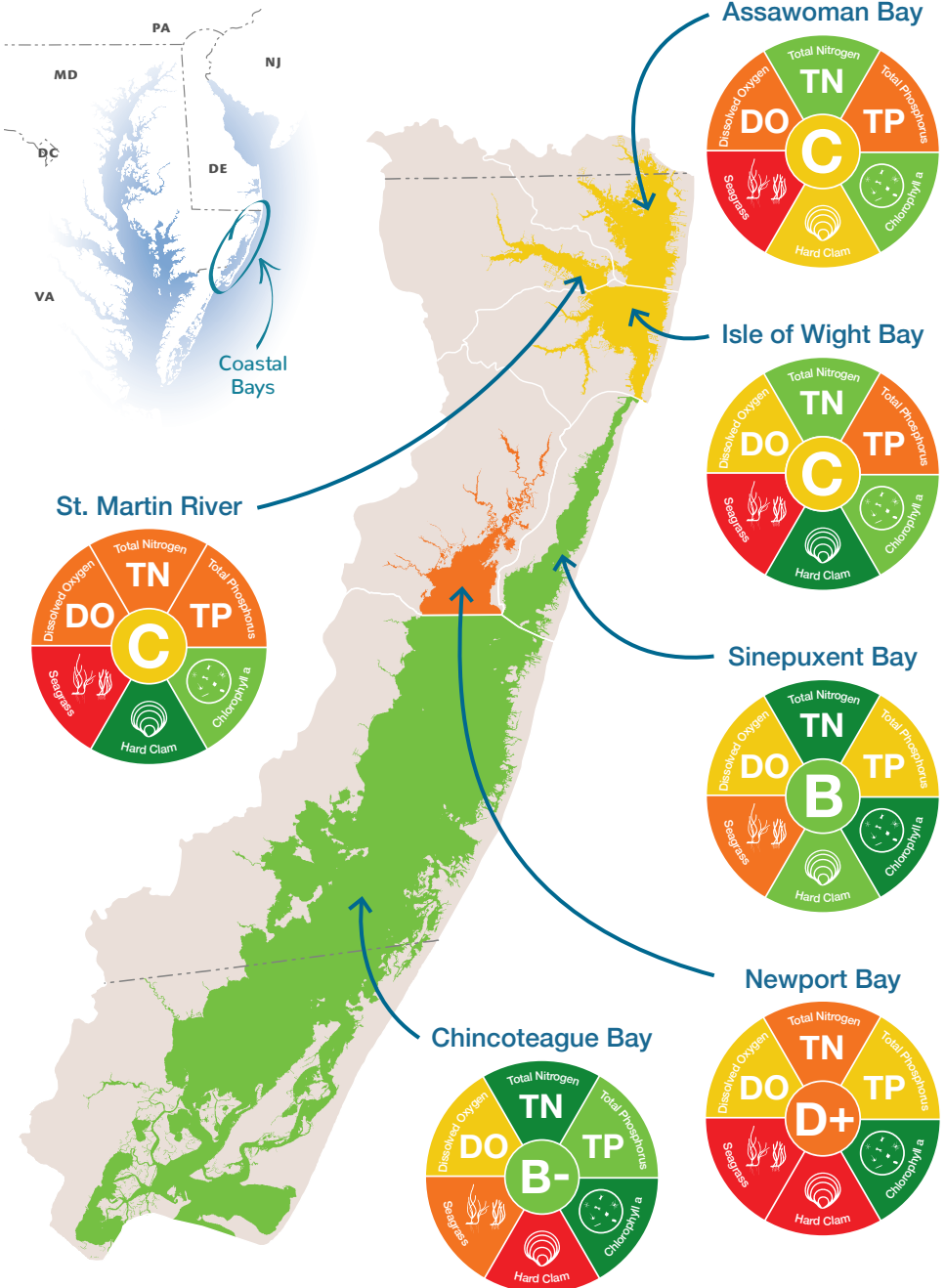

Results showed that nutrients ( ) and HAB species are variable seasonally. Chlorophyll concentrations peaked in the spring and autumn, while nutrients increased in the summer and autumn. The most significant factor of an emergent HAB ⭐ was the presence of nitrate NO_3^- and ammonium NH_4^+. Higher nutrient and chlorophyll concentrations in autumn were due to mixing of resuspended phosphate PO_4^{3-} and phytoplankton species, which normally sink to the bottom. There was also nutrient upwelling from cooler, deeper waters in autumn. Prior to this study, little was known about the HAB species that occur offshore. This research helps illuminate what species of HAB are present, in what numbers, and how they are influenced by environmental conditions.

Regional scores ranged from poor to good

Total nitrogen scores for Newport Bay and St. Martin River continued to be lower than other regions for the third consecutive report. St. Martin River and Isle of Wight Bay had the highest hard clam scores. Seagrass scores were poor or very poor throughout the entire Coastal Bays.

Coastal Bays

Assawoman Bay

Dissolved Oxygen · Total Nitrogen · Total Phosphorus · Chlorophyll a · Hard Clam · Seagrass

DO · TN · TP — **C**

Isle of Wight Bay

Dissolved Oxygen · Total Nitrogen · Total Phosphorus · Chlorophyll a · Hard Clam · Seagrass

DO · TN · TP — **C**

St. Martin River

Dissolved Oxygen · Total Nitrogen · Total Phosphorus · Chlorophyll a · Hard Clam · Seagrass

DO · TN · TP — **C**

Sinepuxent Bay

Dissolved Oxygen · Total Nitrogen · Total Phosphorus · Chlorophyll a · Hard Clam · Seagrass

DO · TN · TP — **B**

Newport Bay

Dissolved Oxygen · Total Nitrogen · Total Phosphorus · Chlorophyll a · Hard Clam · Seagrass

DO · TN · TP — **D+**

Chincoteague Bay

Dissolved Oxygen · Total Nitrogen · Total Phosphorus · Chlorophyll a · Hard Clam · Seagrass

DO · TN · TP — **B-**

Data from 2019 and 2020 reveal mixed results for Maryland's Coastal Bays

Indicators remained consistent in St. Martin and Chincoteague. In Assawoman, declines in dissolved oxygen, phosphorus, and chlorophyll were offset by improvement in hard clams. Isle of Wight's grade slightly decreased due to declining scores for phosphorus and chlorophyll, with improved hard clam densities. Sinepuxent remained at a B despite a decline in the SAV score. Newport's grade decreased to a D+ due to declining scores for dissolved oxygen and hard clams; although scores for phosphorus and chlorophyll improved.

Sinepuxent Bay had the highest score of any region, a B.

Scores for hard clams were very good in St. Martin and Isle of Wight, good in Sinepuxent, moderate in Assawoman, and very poor in Newport and Chincoteague.

This assessment represents the status of water quality and hard clams in 2019 and seagrasses in 2020. Water analyses were delayed due to the COVID-19 pandemic.

Seagrass coverage continues to struggle

Seagrass coverage is currently at only one third of the targeted abundance. Seagrass, also known as submerged aquatic vegetation (SAV), declined in 2005 and 2011 due to elevated water temperatures. Seagrasses are an indicator species because they are sensitive to human disturbances. Seagrass in the bays adjacent Ocean City disappeared in 2014 and was replaced by a variety of seaweeds. Many stressors affect SAV, including cloudy water, nutrient overloading, water temperature, and physical disturbance.
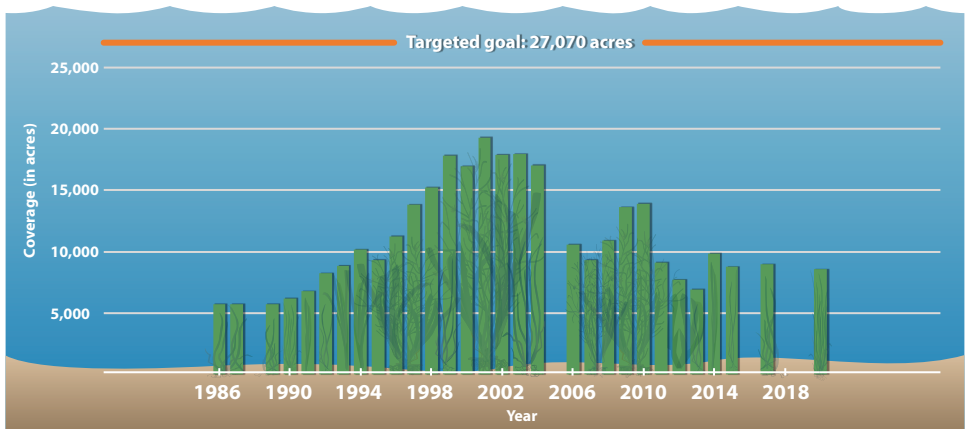
Abundance of seagrass in the Maryland Coastal Bays from 1986 through 2020. The Maryland Coastal Bays Program has a coverage goal of 27,070 acres. Data are not available for 1988, 2005, 2016, 2018 and 2019.

Wetland assessments to help target restoration

In 2019, MCBP began conducting tidal wetland assessments throughout the Coastal Bays watershed. The goal of these assessments is to determine the current health and status of regional tidal wetlands, and to determine how they are changing over time. These assessments will be used to target wetland restoration and conservation projects more efficiently.

MCBP staff measure vegetation density in a Chincoteague Bay wetland.

Living Local project fosters agriculture education

Made possible through an Environmental Protection Agency grant, MCBP, with trusted local partners, launched a new agricultural education project. The project goal was to foster a greater appreciation of farming through the education of students, educators, and community members about best management practices local farmers implement to protect our watershed's natural resources.

A participating farm in the Living Local project. Photo: Sarah Murray Photography.

The Coastal Bays face continuing challenges

Challenges facing the Coastal Bays are common to many coastal areas. How these challenges are met have long lasting impacts. Consistent monitoring is necessary to determine the success of restoration projects and how conditions are changing within the watershed, but funding this activity is a challenge every year. Climate change and associated impacts present another challenge. Sea level rise, shoreline erosion, island and marsh loss, and rising temperatures, particularly high summer water temperatures, continue to damage seagrasses. Additionally, the area remains vulnerable to increasing extreme weather events. To address these challenges, continued resilience planning and implementation, and emphasis on renewable energy, need to continue on local and national levels.

Tidal wetland loss at E.A. Vaughn Wildlife Management Area in Chincoteague Bay.

COVID-19: Innovating and adapting under unusual circumstances

The COVID-19 pandemic has impacted life for all of us. The initial shutdown caused national and state parks to close for a time, homes to be transformed into offices, and halts placed on the analysis of samples. MCBP science staff adapted as strategically as possible and were able to continue their monitoring schedule. The education team worked to design virtual programs and interactive learning opportunities. They developed lesson plans for educators, activities for youth, informational materials geared towards watershed residents, and "ask the experts" videos for people of all ages with the goal of connecting our coastal world to everyone in our locked down communities.

Various education items that went into the activity boxes for MCBP's virtual youth program "Bring the Bays Home".

Acknowledgments

You Can Help

- Limit use of fertilizers

- Compost

- Plant native

- Install a rain barrel

- Follow septic regulations

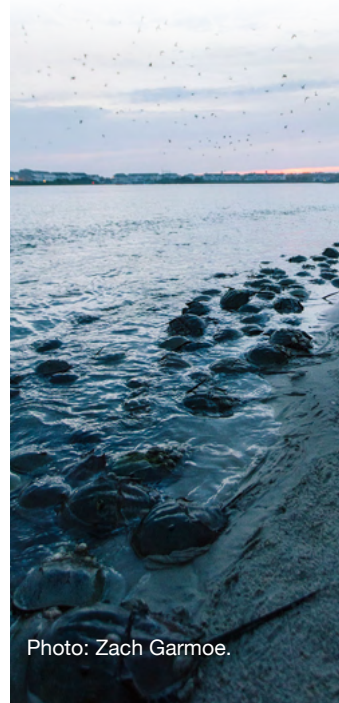- Pick up after your pets

- Volunteer

- Donate

Photo: Zach Garmoe.