

# Coastal Bays Report Card 2018



*Incomplete*

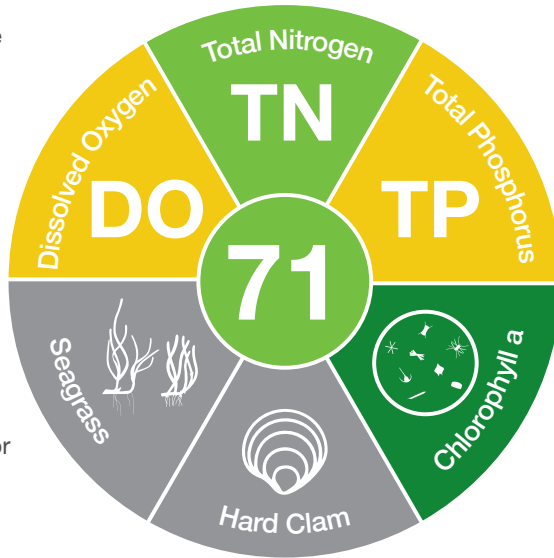
# A lack of data prohibited the calculation of a full health score for the Coastal Bays

Coastal Bays health is defined as the progress of **four water quality indicators** (nitrogen, phosphorous, chlorophyll a, dissolved oxygen) and **two biotic indicators** (seagrass, hard clams) toward scientifically derived ecological thresholds or goals. The Coastal Bays get **“incompletes”** for both seagrass and hard clams this year due to **issues in collecting the data in 2018**. This makes this year’s report card different than past years.

**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, **phosphorous** can limit plant growth if it is not abundant enough, or it can cause algal blooms when in excess.

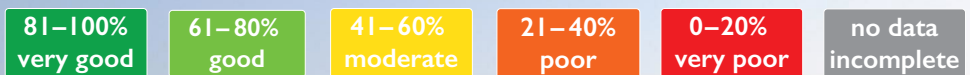


**Seagrass** growth is another indicator of water quality. Seagrasses are sensitive to changes in water quality.

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

**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).

## What do the scores mean?



# Gold stars to valuable partnerships that promote educational and outreach programs across the region

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

The Ocean City chapter of the **Surfrider Foundation** launched its “Strawless Summer” campaign to encourage restaurants and visitors to go straw-free to reduce single-use plastics. This effort began the source reduction campaign in Ocean City.

Through a collaboration with **Maryland Department of Natural Resources, Underwood & Associates, Assateague State Park**, and MCBP, a living shoreline and wetland were constructed at the State Park to restore an eroding beachfront and increase habitat diversity.

In partnership with the **Ocean Pines Association**, MCBP hosted the first annual Bay Day at Ocean Pines. Bay Day was created to emphasize the health of the St. Martin River and engage residents to make a difference.

To become a Maryland Green School, **Buckingham Elementary School** created an outdoor classroom complete with bird houses, native plants, and a nature art mural to engage students to develop a relationship with the environment.

Unveiled in 2018, the new **Worcester County Berlin Library** building was built to be energy efficient with geothermal-based HVAC and envelope lighting. During the first year of operation, energy costs were about \$5,000, which equates to a carbon reduction of about 70%.



*Residents participated in the first annual Ocean Pines Bay Day.*



*Students at the Buckingham Elementary School enjoy their new outdoor classroom.*



*The new Berlin Library is an energy-efficient building.*

# Changing weather patterns threaten the Coastal Bays, challenging our ability to monitor indicators

**Increasing rainfall**, especially from intense storms, washes nutrients and other pollutants into Coastal Bays waters.

**Increased nutrients and temperature** can cause **algae** to grow very quickly, leading to decreases in **water clarity** and **low dissolved oxygen**. Increased rainfall over the last several years has also made it difficult to collect data for seagrass.

**Seagrass extent** is evaluated by **aerial surveys**, which must be conducted in clear weather during the growing season. The reduced number of clear days prevented the aerial surveys in 2018.

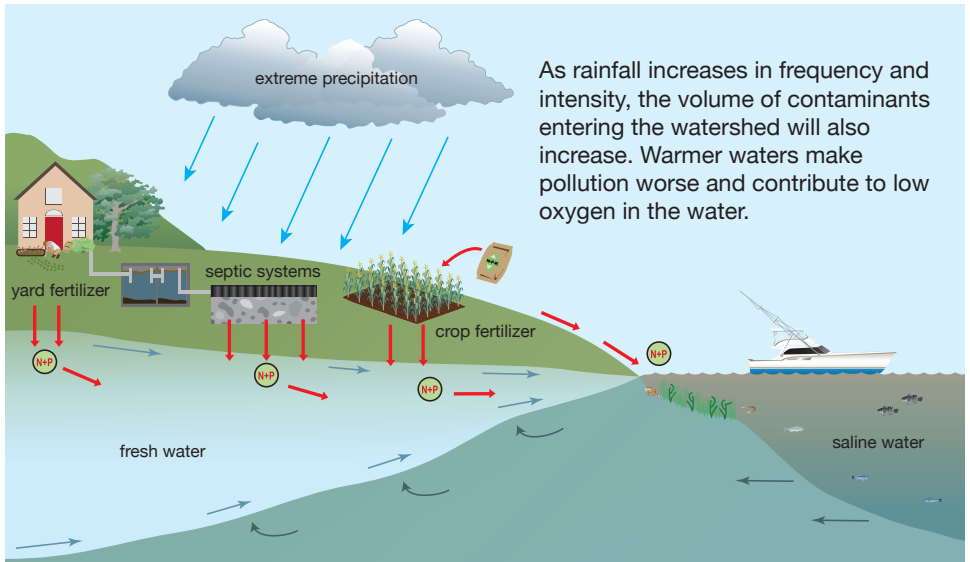


Travis Turnbaugh

*Aquatic vegetation suffers from the effects of increased nutrients and temperature.*

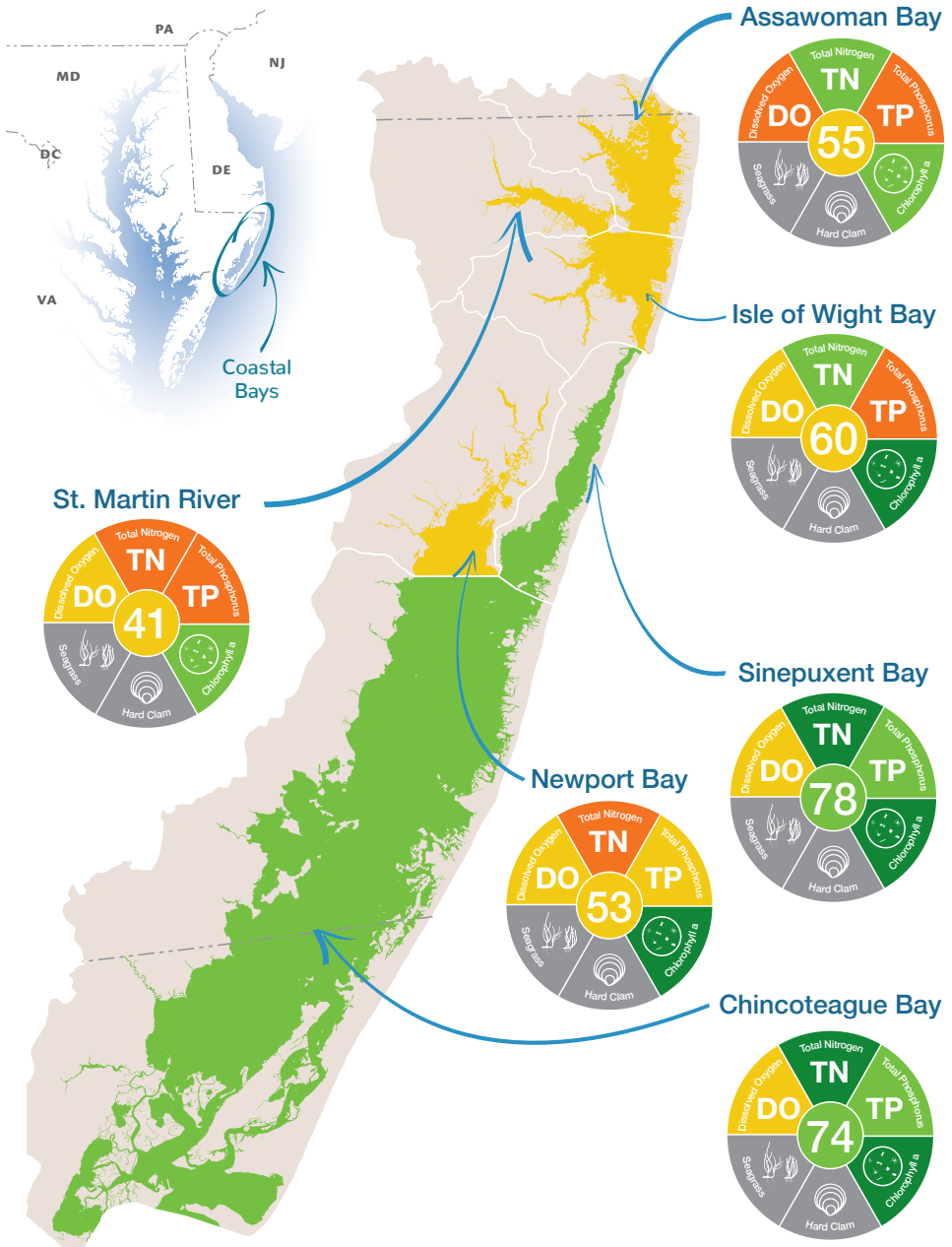
## Watershed inputs negatively affect water quality

**Rainfall and coastal flooding** wash pollutants from agricultural and urban areas in the Coastal Bays. **Fertilizers and pesticides** applied to lawns and fields wash into streams and rivers and soak into ground water. Flooded **septic systems** also contribute pollutants and bacteria into groundwater. All of these pollutants eventually mix with the saltier water in the estuary.



# Water quality in the Coastal Bays is declining

Water quality in all segments **declined** except in Sinepuxent and Newport Bays. Water quality **decreased** in all four parameters in the St. Martin River, Isle of Wight Bay, Assawoman Bay, and Chincoteague Bay. Meanwhile, Newport Bay saw **slight improvement** in nutrients and algae, and Sinepuxent Bay saw **improvement** in total phosphorus levels.



# Multiple, interrelated factors contributed to the decline of water quality

An unusual winter algal bloom affected the northern bays. Beginning in November, Mahogany Tide (caused by the algae *Prorocentrum minimum*) began to discolor waters throughout the northern bays. When agitated, this high-nutrient water tends to produce foam that can accumulate around bulkheads and in canals. The bloom persisted through December and into 2019, reaching record levels of algae in the St. Martin River, Turville Creek, and Bishopville Prong. This widespread, prolonged bloom is likely a result of high nutrient levels and warmer-than-average temperatures in November and December.



Ocean City Today

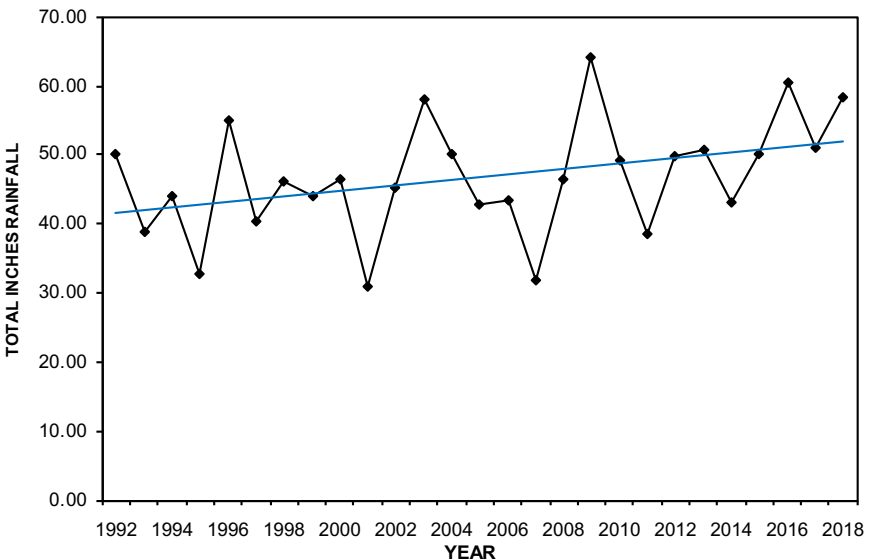
Foam build up as a result of the "mahogany tide".

Record rainfall impacts Coastal Bays water quality. 2018 was the third highest rainfall year recorded on Assateague. Increasing rain brings more runoff from the land. Heavy rains also lead to decreased salinity at many sites in the Coastal Bays which remain low through March–April 2019.



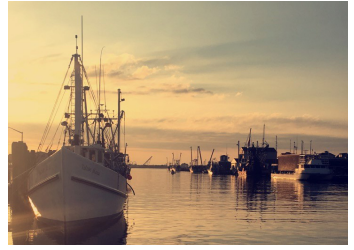
Flooding from excessive rainfall lowers water quality.

## Annual rain data from Assateague Island



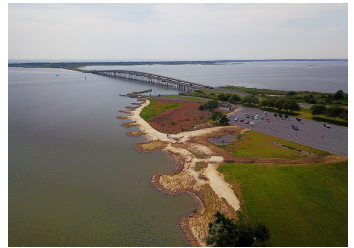
# Recently completed projects promote Coastal Bays health and awareness...

In 2018, the University of Delaware completed an economic valuation of the **Maryland Coastal Bays watershed**. Through contributions directly related to employment, ecosystem services, and tourism, an economic value between \$1 to \$3 billion is contributed annually to the Delaware, Maryland, and Virginia areas that are in the Coastal Bays watershed.



*Commercial harbors in the Coastal Bays landed over \$10M worth of fish each year.*

The **Assateague Living Shoreline** was created to improve a rapidly eroding shoreline and to increase resiliency to large coastal storm events. A series of headland structures were installed to reduce erosion rates and were planted with native salt marsh vegetation. Additional project benefits include habitat enhancement for horseshoe crabs, diamondback terrapins, and migratory shorebirds. The shoreline will also serve as an outdoor classroom and provide public access to Sinepuxent Bay.



*Osprey-eyed view of the newly completed Assateague Living Shoreline.*

## ...but the Coastal Bays face continuing challenges

Many **pollution sources** to the Coastal Bays have been identified, and watershed plans are being developed to reduce **pollutant loads** to our Bays. In Chincoteague Bay however, 58% of the land or almost 60,000 acres drain from Virginia into the Chincoteague Bay. While **Chincoteague Town Council** is addressing wastewater treatment for the commercial area of Town with funding and permitting for a 100,000 gal. capacity treatment system, residential areas continue to be served by existing **on-site septic systems**. Also, **continued monitoring** of vital ecosystem components is problematic. New techniques for monitoring submerged vegetation are being explored since the ability to conduct aerial surveys is hampered by poor weather conditions and **uncertain funding sources**.



*Chincoteague Island is a popular tourist destination.*

# You can help improve the health of the Maryland Coastal Bays

**Remember:** what goes **on the land** eventually goes **into the water**. **Lawn fertilizer** can contribute to over enrichment of our waters, so know the proper use of fertilizers. The best alternative to water soluble chemical fertilizers is **garden compost**. You could **reduce your lawn**, and use landscaping and lawn care that slow runoff and keep sediment and nutrients out of our waterways. If your home is on **septic**, strictly follow recommendations to keep your systems operating efficiently. Pick up after your pets; **pet waste** can be a significant contributor of bacteria and nutrients to our waters.



*The Maryland Coastal Bays Program planted a demonstration native plant garden to attract pollinators.*

## Acknowledgments

This report card was produced in 2019 by the Integration and Application Network at the University of Maryland Center for Environmental Science, Maryland Department of Natural Resources, and the Maryland Coastal Bays Program. The following organizations also contributed significantly to the development of the report card: National Oceanic and Atmospheric Administration, the National Park Service, and Virginia Institute of Marine Science. This publication was developed under Cooperative Agreement CE-9863209-13 awarded by the U.S. EPA to Maryland Coastal Bays Program. It has not been formally reviewed by the EPA. The views expressed in this document are solely those of the authors and do not necessarily reflect those of the Agency.

*All photos Maryland Coastal Bays Program, unless otherwise stated. Right: Kayakers exploring Chincoteague Bay. George Schnakenberg Jr. Banner photo bottom of page 2: A pier leads to the beach at Big Assawoman Bay. Lee Cannon.*



## Quick Tips

- Limit use of fertilizers
- Compost
- Plant native
- Install a rain barrel
- Follow septic regulations
- Pick up after your pets
- Volunteer
- Donate

