

MYSTIC RIVER and WEQUETEQUOCK COVE REPORT CARD 2008 to 2022



Mystic Bascule Bridge



Healthy watersheds and bays support abundant wildlife and provide recreational opportunities. photo: NOAA



How's the Water?

Good water quality supports a diverse community of animals, plants, and habitats. It is characterized by high dissolved oxygen and water clarity, and low chlorophyll a and seaweed. Common symptoms of poor water quality are low dissolved oxygen levels, called hypoxia, and algae blooms (evidenced by high chlorophyll a and/or seaweed). While some algae are essential to support the base of the food web, too much nitrogen from human sources stimulates excessive growth of algae. As algae and the animals that feed on them respire, die, and decompose, oxygen in the water is depleted.



Measuring the Health of Our Bays

CUSH started monitoring water quality in bays of southeastern Connecticut in 2008, following the guidelines of University of Rhode Island's Watershed Watch. Watershed Watch, a Cooperative Extension program, is committed to providing information on the water quality of surface water resources in southern New England, with volunteers and scientists collaborating to understand our estuaries and fresh water. With the launch of Save the Sound's Unified Water Study in 2017, CUSH expanded sampling to allow for inclusion of data

in the Unified Water Study and the resulting Long Island Sound and Bays Report Card. The Unified Water Study currently includes community-based sampling of 59 bays and bay segments across Long Island Sound. Both monitoring programs standardize the procedures of measuring water quality, ensuring consistency of the data collected.

As noted in the latest Long Island Sound report card, 43% of assessed bays and bay segments located around Long Island Sound are in good health, receiving grades of B- or better. It's important to understand how water quality challenges in bays differ greatly from the open Long Island Sound. Small bays and inland segments of larger ones suffer from poor tidal flushing and impacts from local human-sourced pollution flowing in from rivers, streams, and groundwater. Excess nitrogen from sewers, septic systems, abundant and sometimes unnecessary lawn fertilizer applications, and fossil fuel usage are some of the major contributors to detrimental conditions for marine life in Long Island Sound bays.

Water Quality in Our Bays

Each bay is unique and that is reflected in its water quality. Bays are highly susceptible to local pollutants, and while efforts underway should produce future success stories, the grades indicate the impact pollution has on coastal waters. This is especially true where tidal exchange with the open Long Island Sound and Fishers Island Sound is low and pollutants from the rivers and streams are high.



Right: CUSH volunteers taking water samples at Mystic River Park.

Left: Large amounts of a single type of green seaweed coating the bottom is an indicator of nutrient pollution, impaired water quality, and a degraded habitat.



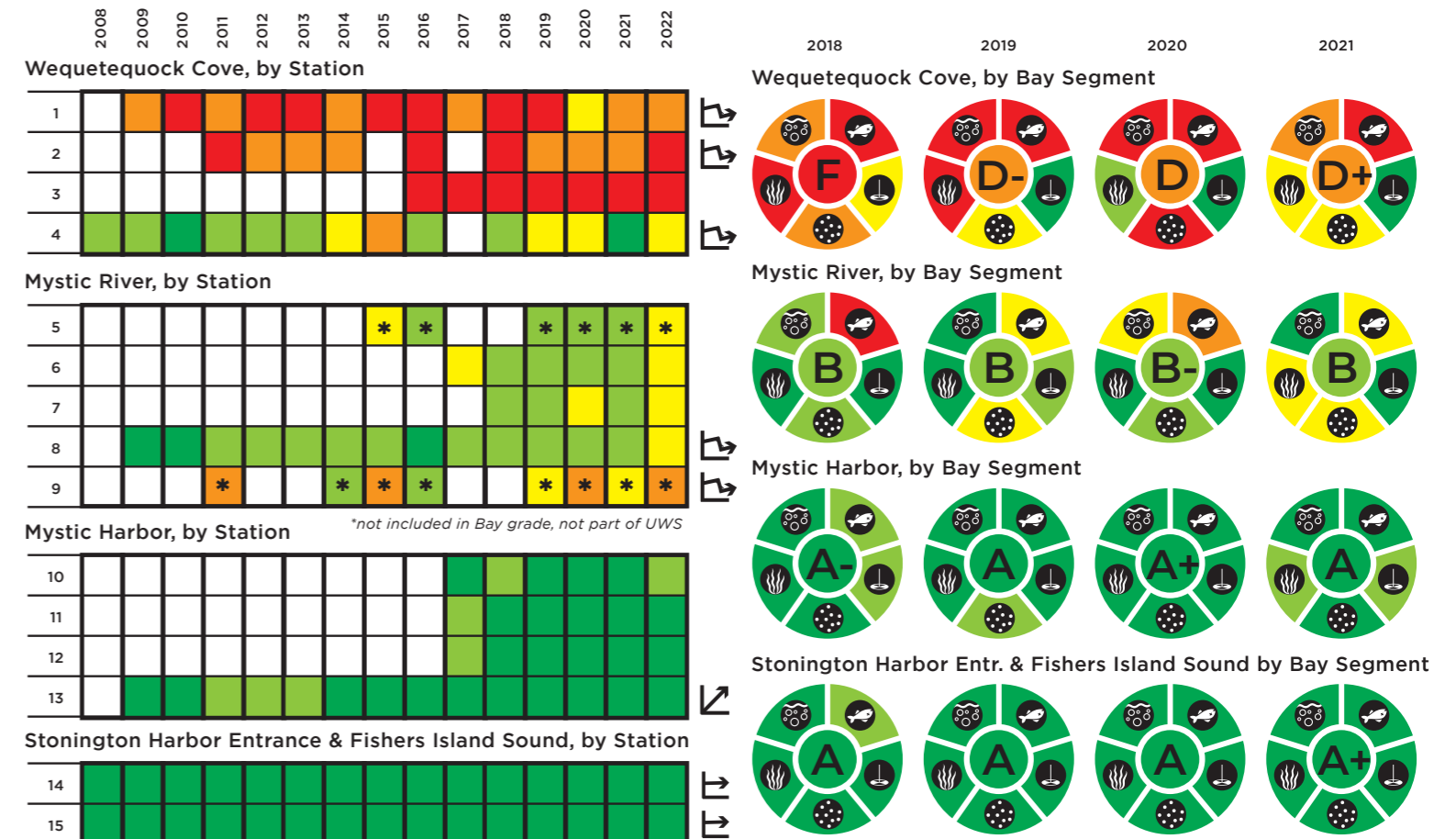
Our Bays in Context

As part of the Unified Water Study, 59 bay segments are monitored across 45 bays; the bay segments presented here are among this larger Long Island Sound monitoring effort. The most recent Long Island Sound Report Card indicated 57% of bay segments sampled in 2021 received a "C," "D," or "F."

Sources of Pollution

While coastlines are naturally nutrient-rich, humans contribute an overabundance of nutrients (especially nitrogen) from septic and sewer water; fertilizer applied to our yards, parks, and cropland; and fossil fuel emission from heating and vehicles.

A Retrospective of Water Quality – Station numbers correspond to the labels shown on the map. The Bay Segments are graded only for 2018 to 2022, when all stations were sampled under the UWS. See map for 2022 data.



Bay Indicators

These water quality indicators are selected to measure the environmental health of Long Island Sound waters and assess their ability to support aquatic life and marine habitats.

Dissolved Oxygen
Low levels of dissolved oxygen impact marine life, reducing growth and reproduction, and, at low enough levels, causing death.

Chlorophyll α
Chlorophyll α measures the amount of phytoplankton in the water column. These microalgae use nutrients entering Long Island Sound to grow.

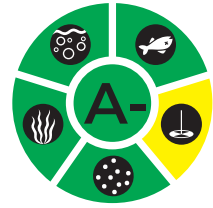
Water Clarity
Water clarity is a measure of how far light penetrates through the water. Clear water allows fish to find prey and helps underwater plants thrive.

Seaweeds
Seaweeds are common in healthy salt water systems. However, excessive accumulation can be harmful to environmental health and indicate excess nitrogen pollution.

Oxygen Saturation
Healthy water should have oxygen levels in equilibrium with the air, termed 100% saturation. Water quality problems are indicated when oxygen is consistently higher or lower than 100% saturation.

Mystic Harbor

Received an A- (92%), down from 94% in 2021. While generally scoring well due to tidal flushing with the Sound, both



dissolved oxygen and water clarity occasionally have worse years, though both are typically above 80% for the indicator.

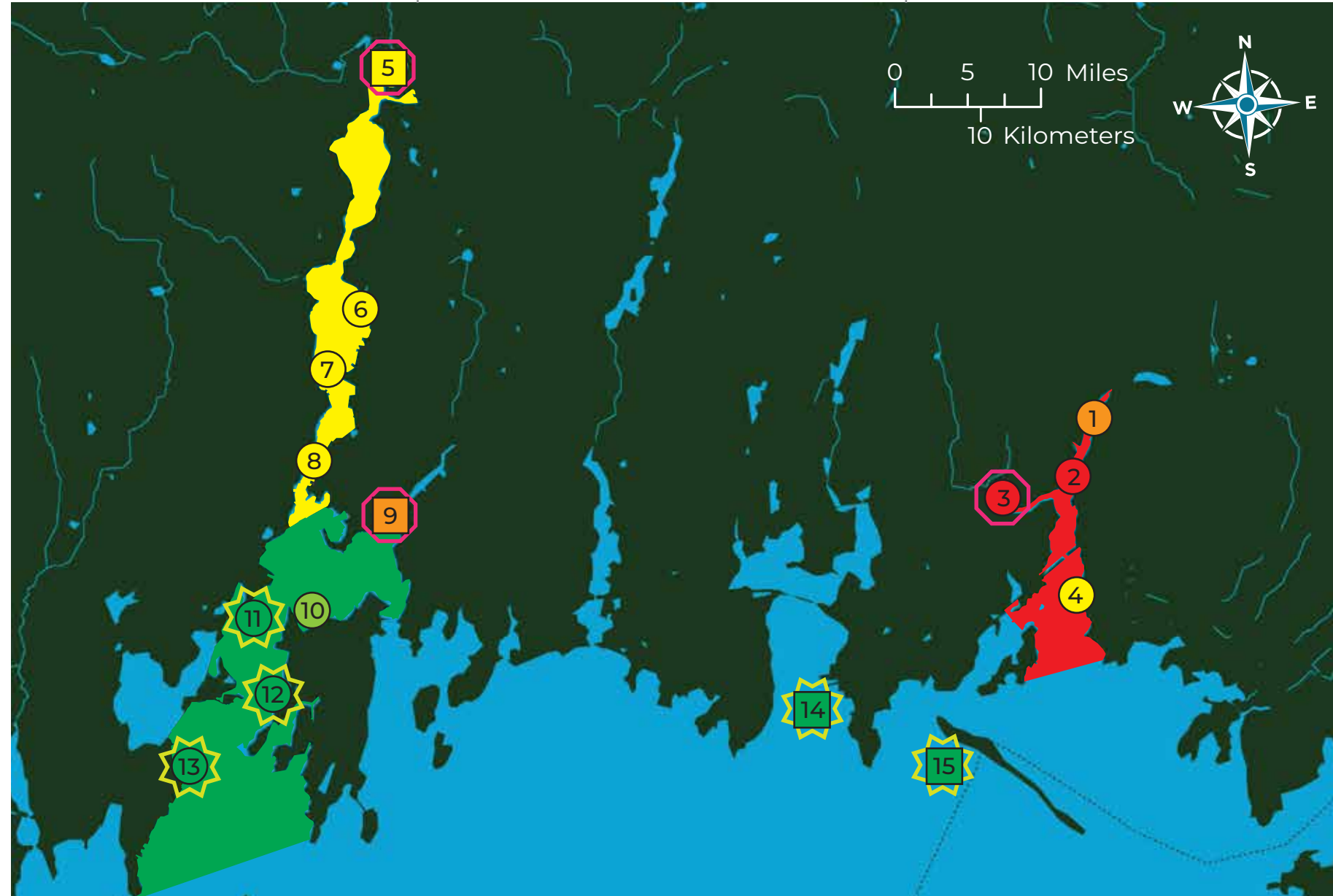
Mystic River

Received a C (76%), a full grade lower than in 2021 (85%). Although this was a decrease, the 14-year trend indicates this site is variable, and often in the B-range. The hypoxia score tends to be low, and chlorophyll is generally good.



Wequetequock Cove

Received an F (59%) down from an all-time high score of 68% in 2021. The bay typically scores < 65%. The Cove is negatively impacted by nutrient inputs from the watershed and from the Pawcatuck River which fuels a massive seaweed bloom.



KEY

Grades

A	(90-100%)
B	(80-90%)
C	(70-80%)
D	(60-70%)
F	(0-60%)

Trend

↗	Improving
→	Stable
↔	Variable
↘	Declining

○	Part of the UWS and URIWW
□	Part of URIWW, not in the UWS
⬡	Higher risk of fecal contamination*
★	Lower risk of fecal contamination*

*For all waters, avoid contact following rainfall of more than 1 inch in 24 hours.

How Are the Scores Calculated?

Like test scores in school, water quality scores are calculated by comparing the bay indicators with values known to be optimal for aquatic life. Save the Sound and its science advisors grade water quality indicators using scientifically derived scales developed with a Technical Advisory Committee of scientists and water managers from agencies around the Sound. Some indicators are used for both the Sound and the bays, while others are unique to the deeper Sound or the shallower bays, reflecting the differences in these types of systems. Look for "Learn About Grades" at: www.soundhealthexplorer.org/fishable

"We have met the enemy and he is us." - Pogo 1970

A phrase first uttered by Walt Kelly's comic strip character, Pogo, on an Earth Day 1970 anti-pollution poster holds true today. We humans are still the greatest source of environmental impact 50+ years later whether it is bacteria, nutrients, stormwater runoff, or inappropriate development.

Protecting and restoring healthy habitats on the land and along the coast protects human health by providing abundant fisheries and aquaculture, clean drinking water, and swimmable beaches. Diverse natural habitats and wildlife are the visible expression of a healthy system. The water quality grade is a metric of habitat health, while fecal indicator bacteria levels indicate the potential impact on human health.

Monthly spot checks of bacteria provide snapshot glimpses into the degree of fecal contamination in coastal waters. Data highlight that waters with greater tidal flushing from the Sound have not only excellent water quality from a habitat standpoint (the "grades"), but also a much lower risk of fecal contamination compared to inland areas with restricted flow. While related, they are not the same – water quality grades reflect the health of the natural habitat whereas fecal contamination impacts human health.

For a more detailed analysis of bacteria and beaches, refer to Save the Sound's Sound Health Explorer: <https://soundhealthexplorer.org/>

Data were collected as part of URI Watershed Watch Program and Save the Sound's Unified Water Study. CUSH Water Quality Monitoring Co-chairs are Jack Leary and Fran Pijar. Financial support provided by the CUSH membership and grants from the Rotary Club of Mystic (2021) and Power of Together 2, Southeastern Connecticut (2022).

Take Action

Our waterways are a mirror of how we live on the land, so you have a direct role in the health and well-being of the Sound. Join the movement to protect and restore Long Island Sound by taking these important actions.



Capture Storm Water

A rain garden is a depressed area in the landscape that collects rain water from a roof, driveway or street and allows it to soak into the ground. Rainwater tanks harvest roof runoff.



Maintain Your Septic

Private sewer lines and septic systems should be regularly inspected, repaired, and pumped out. Encourage CT legislators to approve N-removing septic systems.



Keep Litter Out of Waterways

Use less plastic. Reusable bags, straws, water bottles, and cups keep harmful plastics out of oceans and away from marine life. Pick up after your pets. Don't feed water fowl.



Plant Native

Native plants reduce water usage in yards, help filter pollutants along waterways, and provide food and shelter to wildlife.



Make Your Voice Heard

Tell elected officials you want policies that support clean water. Use your purchasing power to reward companies that put the environment first.



Eliminate or Reduce Fertilizer Use

Use half the amount, only around Labor Day or Memorial Day. Leave grass clippings on the lawn as a natural fertilizer. Remove clippings from the street before they flow into storm drains.



This Report Card provides a geographic assessment of Southeastern Connecticut estuaries (Mystic River and Wequetequock Cove) for 2008 through 2022. It was produced by Clean Up Sound & Harbors (CUSH) with the assistance of Save The Sound and made possible by the generous support from the Long Island Sound Stewardship Fund. The data were collected by the many dedicated CUSH volunteers who have contributed their time over the years, processed by URI Watershed Watch, and analyzed by Jamie Vaudrey, Ph.D. Document printed on a wind-powered press with renewable energy, post-consumer recycled paper, and vegetable-based inks.

Working to eliminate nitrogen pollution, bacterial contamination, and plastic waste from our local waters.

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