

A tall, cylindrical lighthouse with a white base, a dark red middle section, and a white top section with a lantern room. To the left is a stone building with a blue roof and a door marked '1867'. The foreground is a rocky shore with green algae, and the background is a blue sky with light clouds.

LONG ISLAND SOUND REPORT CARD 2020

Execution Rocks Lighthouse in Long Island Sound between
New Rochelle Harbor and Sands Point, New York



Save the Sound[®]
Action for our region's environment.

The Health of the Sound: What You Should Know

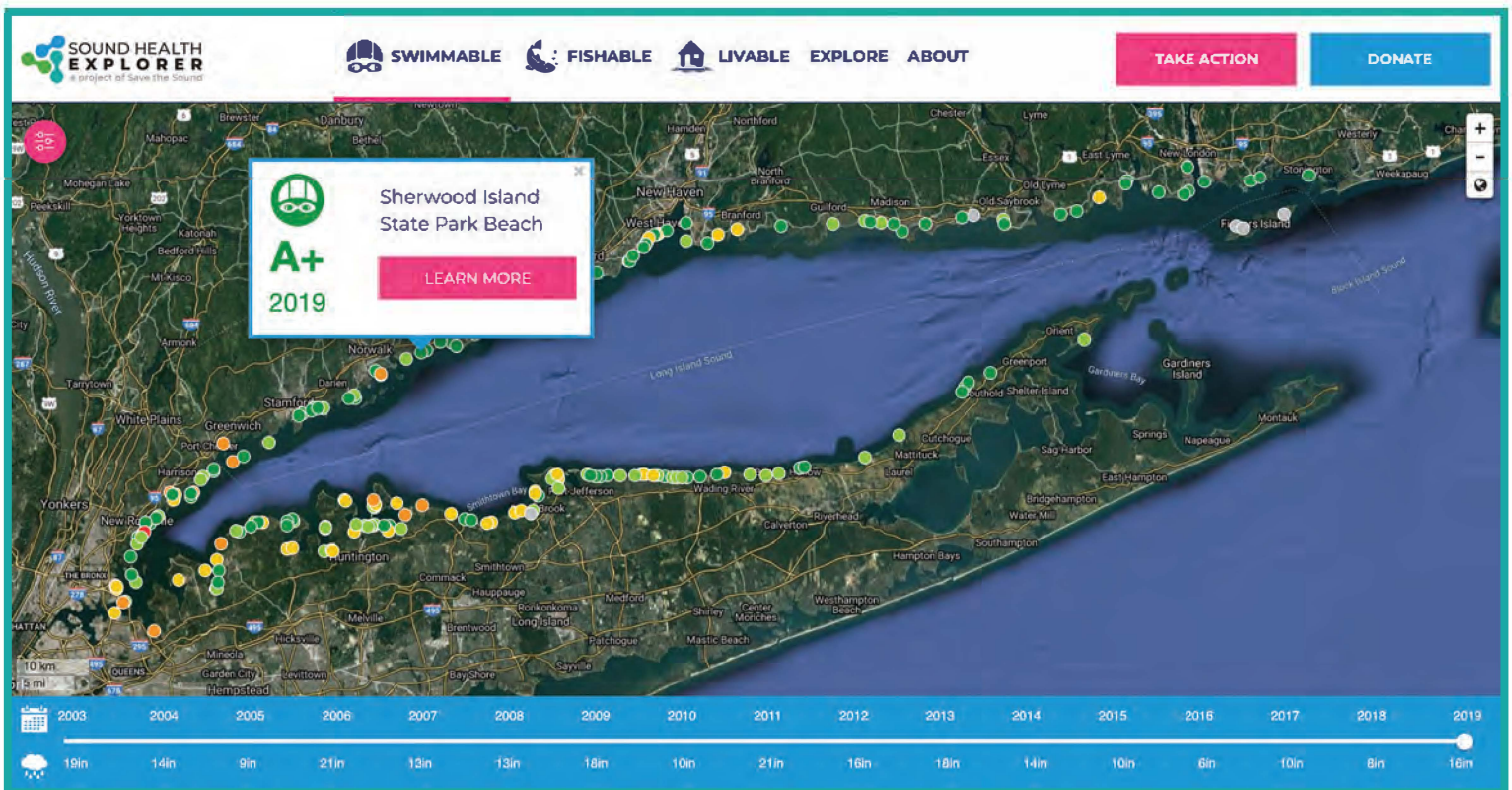
Save the Sound publishes the biennial Long Island Sound Report Card to track and report on the ecological health of the Sound, including trend lines showing patterns over the past 12 years. In this year's report, for the first time you'll also find data for many of the bays found along the margin of the Sound.

Nitrogen pollution remains a major threat to a healthy Sound. The impact is often more visible in stressed bays which experience episodic fish die-offs and large seaweed blooms. Readers may be surprised that water quality in the bays cannot be predicted by water quality in adjacent portions of the open Sound. For example, Wequetequock Cove in the relatively pristine Eastern Basin (A+) receives a D-, while New Rochelle Harbor, situated on the border between the Western Narrows (F) and Eastern Narrows (C), receives a B-. This emphasizes the importance of local conditions and the role communities play in degrading or improving their coastal water quality.

Coordinated investments in conservation and improvements in wastewater treatment have helped clean the Sound over the past decade. Despite this, the open waters of the Sound show a slight decline in some regions when compared with the 2018 Report Card. These changes are associated with higher levels of chlorophyll *a* and dissolved organic carbon, likely attributable to annual changes in weather. Because rising temperatures exacerbate water quality problems, it's even more critical we continue to reduce nitrogen input in the coming years in order to protect and continue the progress we have made in improving water quality in the Sound.

We envision this Report Card empowering community members and elected officials with information you can use to protect and restore Long Island Sound for all who call it home.

Dive into the Data and *Take Action* on SoundHealthExplorer.org



2019 Beach Grades displayed in the NEW Sound Health Explorer

Good data can engage communities and drive action. Sound Health Explorer is an interactive tool that couples recent and historic data from your local bay, beach, or open Sound region with things you can do that will help make a difference. Explore how sea level rise will impact your community. Explore the health of Long Island Sound at SoundHealthExplorer.org.

How's the Water?

Good water quality supports a diverse assortment of animals and plants in a wide range of habitats. It is characterized by high dissolved oxygen and water clarity; and low chlorophyll α , dissolved organic carbon, and seaweed. Common symptoms of poor water quality are low dissolved oxygen levels, called hypoxia, and algae blooms (evidenced by high chlorophyll α or seaweed). Excess nitrogen from human sources fertilizes excessive growth of algae. As algae and the animals that feed on them respire, die, and decompose, oxygen in the water is depleted.

Water Quality in the Open Sound

Current water quality grades are largely consistent with recent years, trending from excellent in the east to poor in the west. This pattern is driven by greater tidal exchange with the Atlantic Ocean and lower population density in the east, with increasing population — and associated pollutants — as one travels west towards New York City. The western Sound's lower tidal exchange with the ocean amplifies the impact of pollutants, as it takes longer for them to flush out to sea.

Water quality trends in the open Sound as a whole are still stable even though there was a slight decrease in the numeric grades. The Eastern Narrows and Western Basin shifted from an “improving trend” to a “variable trend,” likely due to variability in weather-driven conditions. Warmer and/or wetter conditions can exacerbate water quality problems. Unfortunately, we expect the trend of warmer temperatures and more variable precipitation to continue. To protect water quality and counteract these trends, further reduction of nitrogen and stormwater is an important management priority into the future.

Water Quality in Our Bays

Each bay is unique and that is reflected in its water quality. Of the 50 segments monitored across 38 bays, 56% received a “C,” “D,” or “F.” Only six received an “A.” This shows the outsized impact that pollution from our communities has on coastal waters, especially where tidal exchange with the open Sound is low and pollutant loads from the rivers and streams are high. The grades show hypoxia as the biggest problem, followed by its companion stressor – excessive seaweed.

Open water data provided courtesy of:

CT Dept. of Energy & Environmental Protection (CT DEEP)

NYC Dept. of Environmental Protection (NYC DEP)

Interstate Environmental Commission (IEC)

Open Water Indicators



Dissolved Organic Carbon

Dissolved organic carbon is relatively stable, making it a good indicator of human impacts. Most human sources of nutrients are high in DOC.



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

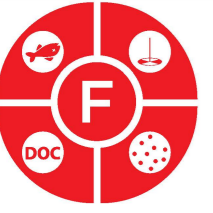
Healthy water should have oxygen levels in equilibrium with the air, termed 100% saturation. Water quality problems are indicated when oxygen is consistently higher or lower than 100% saturation.

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.

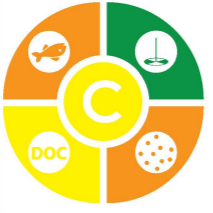
Western Narrows ↘

Received an F (44%), similar to 2017 (45%), with a "variable" 12-year trend. Chlorophyll α and water clarity grades are declining while DOC is improving. Efforts have reduced nitrogen load to this region; however, our changing climate, population, and development are continuing challenges.



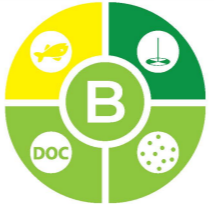
Eastern Narrows ↘

Received a C (74%), a decrease from 2017 (82%), primarily due to worsening chlorophyll α . Fluctuating weather conditions likely caused the 12-year trend shift from "improving" to "variable." Vigilance is needed to ensure the gains here aren't lost to unchecked development and climate change.



Western Basin ↘

Received a B (86%), a slight decrease from 2017 (92%), primarily due to worsening chlorophyll α . Similar to E. Narrows, changing weather conditions likely caused the 12-year trend shift from "improving" to "variable." This area is less developed than the Narrows but is still densely populated.



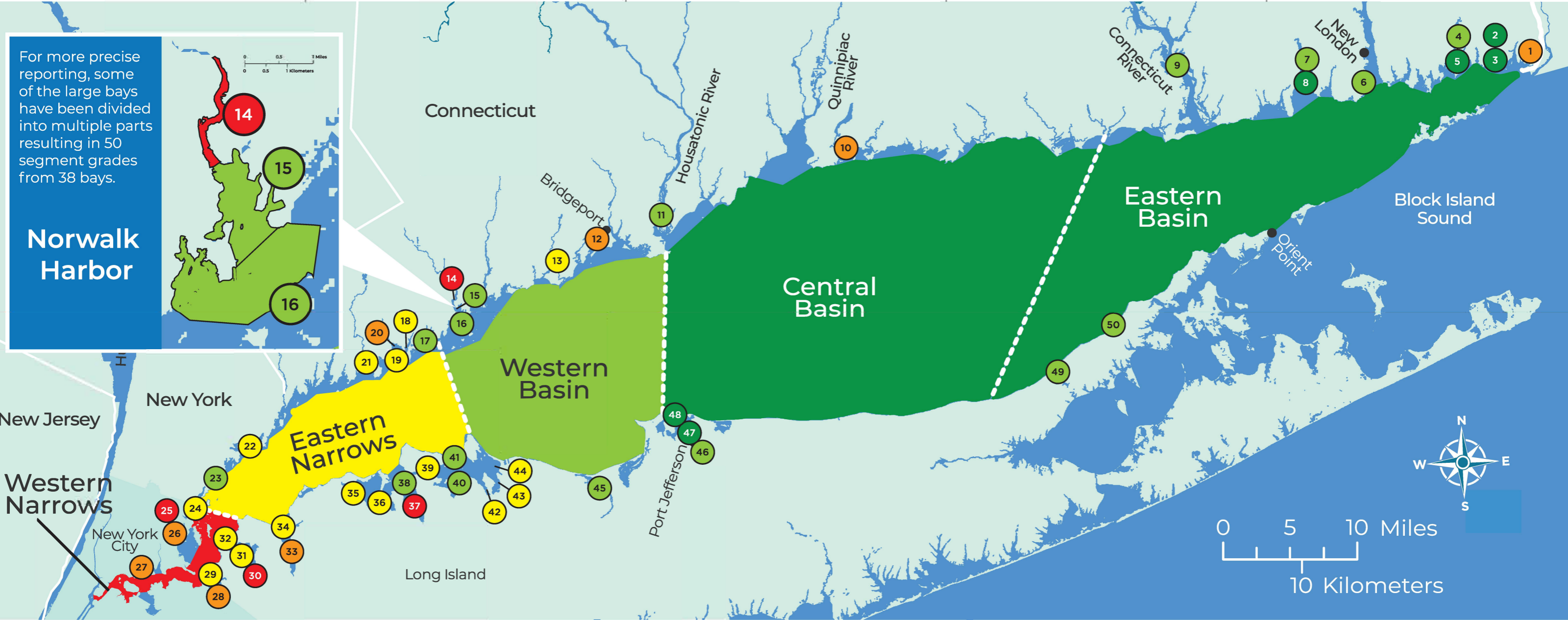
Central Basin ↘

Received an A (95%), similar to 2017 (96%). Water quality has been stable over the past 12 years and is consistently supportive of marine life. It is the largest area of open water contained in the Report Card and is well-flushed with water from the Atlantic Ocean.



Eastern Basin ↘

Received an A+ (99%), similar to 2017 (100%). Water quality has been stable over the past 12 years, never dropping below an A. This region has a much lower coastal population with large tracts of undeveloped land. Being adjacent to the ocean, it has strong tidal exchange.



For more precise reporting, some of the large bays have been divided into multiple parts resulting in 50 segment grades from 38 bays.

Norwalk Harbor

How Are The Scores Calculated?

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. For more information on the scoring methods, visit: www.soundhealthexplorer.org/fishable/

KEY

2019 Season Grades	12 Year Trend
A (90-100%)	↗ Improving
B (80-90%)	→ Stable
C (70-80%)	↘ Variable
D (60-70%)	↙ Declining
F (0-60%)	

Why Are Bays Different?

Our bays differ from the deeper waters of the Sound and from each other. Their shapes, sizes, and depths; the rivers that feed them; and their coastal population and land use practices all impact their water quality. They are shallower areas where light often reaches the bottom, allowing nuisance seaweed to flourish when nitrogen from their streams and rivers is high. Water moves through each of them differently, with some very open to and influenced by the deeper Sound waters and others less so.

Bay Grades



Clean Up Sound & Harbors



1	Wequetequock Cove	Red	Yellow	Green	Red	Red	D-
4	Mystic River	Green	Yellow	Light Green	Green	Yellow	B
5	Mystic Harbor	Green	Light Green	Green	Green	Green	A

New England Science & Sailing Foundation

2	Inner Stonington Hbr	Light Green	Green	Green	Orange	Green	A-
3	Outer Stonington Hbr	Green	Green	Green	Light Green	Green	A
6	Alewife Cove	Green	Green	Orange	Orange	Green	B

Save the River — Save the Hills

7	Inner Niantic River	Light Green	Light Green	Green	Light Green	Orange	B
8	Outer Niantic River	Green	Green	Green	Yellow	Green	A-

Connecticut River Conservancy

9	Connecticut River	Yellow	Light Green	Light Green	Green	Green	B+
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Friends of the Farm River Estuary

10	Farm River	Green	Green	Red	Red	Red	D
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Town of Stratford Conservation Department

11	Outer Housatonic River	Green	Green	Red	Green	Green	B+
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Ash Creek Conservation Association

12	Black Rock Harbor	Light Green	Orange	Green	Orange	Red	D
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Town of Fairfield Conservation Department

13	Mill Rvr (Southport Hbr)	Green	Yellow	Yellow	Yellow	Orange	C+
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Harbor Watch

14	Inner Norwalk Harbor	Red	Yellow	Light Green	Red	Red	F
15	Middle Norwalk Harbor	Light Green	Light Green	Light Green	Yellow	Yellow	B-

The Maritime Aquarium at Norwalk

16	Outer Norwalk Harbor	Green	Green	Green	Orange	Light Green	B+
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Town of Darien

17	Scott Cove	Green	Light Green	Red	Green	Light Green	B
18	Darien Harbor	Green	Green	Red	Green	Yellow	C+
19	Cove Harbor	Green	Light Green	Red	Light Green	Yellow	C

SoundWaters

20	Holly Pond	Light Green	Orange	Orange	Red	Yellow	D+
21	Stamford Harbor	Light Green	Red	Green	Light Green	Yellow	C+

Derecktor Shipyards

22	Mamaroneck Harbor	Green	Yellow	Green	Red	Red	C-
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Save the Sound

23	New Rochelle Harbor	Green	Light Green	Green	Light Green	Red	B-
24	Hunter Island Bay	Green	Orange	Light Green	Red	Red	C-
25	Inner Eastchester Bay	Red	Orange	Light Green	Light Green	Red	F
26	Outer Eastchester Bay	Green	Orange	Green	Orange	Red	D+

Bronx River Alliance

27	Bronx River	Red	Yellow	Yellow	Green	Red	D-
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Interstate Environmental Commission

28	Inner Little Neck Bay	Yellow	Orange	Yellow	Orange	Red	D-
29	Outer Little Neck Bay	Light Green	Light Green	Green	Red	Red	C-
30	Inner Manhasset Bay	Yellow	Red	Light Green	Orange	Red	F
31	Middle Manhasset Bay	Orange	Yellow	Green	Light Green	Red	C
32	Outer Manhasset Bay	Yellow	Light Green	Green	Light Green	Red	C+

Coalition to Save Hempstead Harbor

33	Middle Hempstead Hbr	Yellow	Red	Light Green	Yellow	Red	D
34	Outer Hempstead Hbr	Yellow	Yellow	Green	Yellow	Orange	C+

Friends of the Bay

35	Mill Neck Creek	Green	Orange	Light Green	Orange	Light Green	C+
36	Oyster Bay	Green	Orange	Light Green	Yellow	Yellow	C+
37	Inner Cold Spring Hbr	Green	Red	Light Green	Red	Red	F
38	Outer Cold Spring Hbr	Green	Yellow	Green	Yellow	Green	B

Cornell Cooperative Extension of Suffolk County Marine Program

39	Lloyd Harbor	Green	Yellow	Light Green	Light Green	Red	C+
40	Huntington Harbor	Light Green	Orange	Light Green	Light Green	Yellow	B-
41	Huntington Bay	Green	Light Green	Green	Yellow	Orange	B
42	Centerport Harbor	Green	Yellow	Light Green	Red	Orange	C
43	Northport Harbor	Green	Red	Light Green	Light Green	Red	C-
44	Northport Bay	Green	Yellow	Light Green	Red	Yellow	C

Salonga Wetland Advocates Network

45	Nissequogue River	Red	Green	Green	Red	Green	B-
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Setauket Harbor Task Force

46	Inner Port Jefferson Hbr	Green	Light Green	Light Green	Yellow	Green	B+
47	Middle Port Jefferson Hbr	Green	Light Green	Light Green	Light Green	Light Green	A
48	Outer Port Jefferson Hbr	Green	Light Green	Light Green	Light Green	Light Green	A

Group for the East End

49	Mattituck Creek	Green	Yellow	Light Green	Orange	Light Green	B-
50	Goldsmith Inlet	Light Green	Yellow	Green	Yellow	Green	B

Bay data provided courtesy of the organizations listed above each location.

Meet the Unified Water Study: Measuring the Health of Our Bays

In 2017, Save the Sound started the Unified Water Study (UWS) to measure the health of our bays. The margins of Long Island Sound are home to more than 100 unique bays which differ greatly from the open water of the Sound. In either habitat, the question we are exploring is the same: does the water quality support healthy and diverse native marine life?

The UWS is fueled by a network of 22 partner groups working together in 38 bays across the Sound. These local groups receive support from Save the Sound, the study's Science Advisors, and our funder, EPA's Long Island Sound Study. They are provided with monitoring equipment and training and adhere to a set of standard procedures to assure the quality and consistency of the data.



Peter Linderoth, Director of Water Quality for Save the Sound, and Bronx River Alliance staff sampling on the Bronx River

Less than half of the bays studied (14 out of 38) are in good health, with a grade of B- or better. We are documenting bays suffering from water quality issues, including an overabundance of seaweed, poor water clarity, high chlorophyll α , and hypoxia — a severe lack of oxygen in the water that can cause aquatic life to flee or suffocate and die.

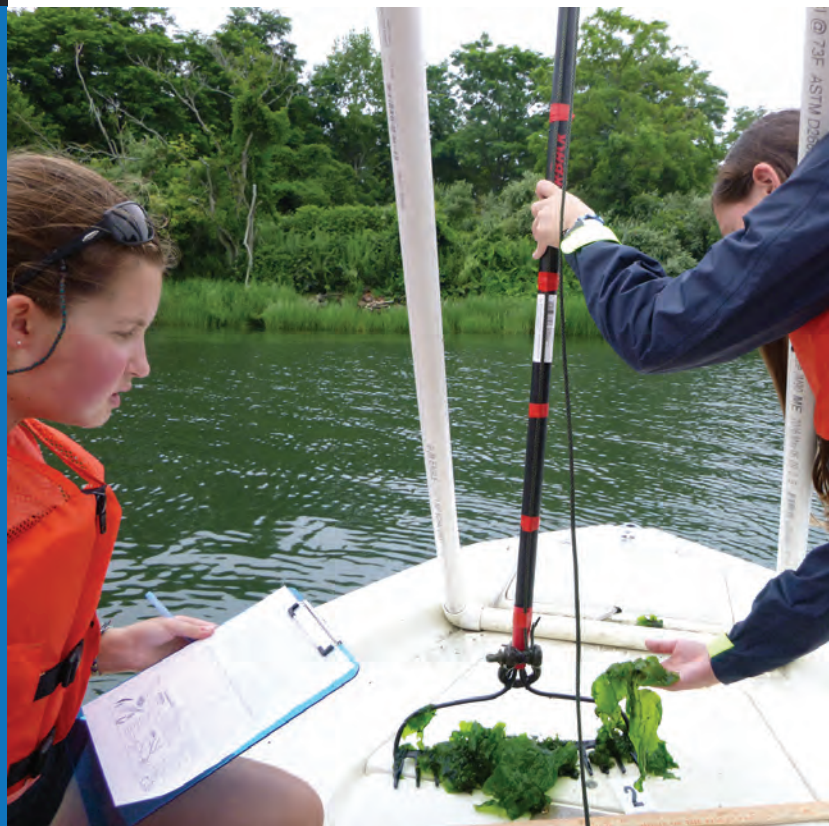
Bays with multiple segments show patterns similar to the larger Sound, with inland areas suffering from poor tidal flushing and greater impact from human-sourced pollution flowing in from rivers, streams, and groundwater. Specifically, excess nitrogen from sewers, septic systems, lawn fertilizer, and fossil fuel use are major stressors in some bays. These local conditions can account for the differing water quality between some bays and the adjacent open water.

Ash Creek Conservation Association sampling macrophytes

How Can We Protect the Sound?

Upgraded sewage treatment and nitrogen-removing septic systems help reduce the nitrogen entering the Sound. Keeping toxins, fertilizer, and garbage out of our stormwater, streams, and rivers is critically important. Preserving living shorelines and the green spaces in our communities while also limiting development on the coast are all important for a healthy Sound. These actions also provide myriad other benefits to humans and wildlife.

Perhaps most importantly, we need sound science to continue to measure the health of our aquatic ecosystems and drive investments in protecting and restoring stressed waterways. Please support Save the Sound and all the groups working tirelessly in your community to collect these valuable data – see the Bay Grades next to the map for a list of these groups.





Participants gathering marine debris during the 2019 International Coastal Cleanup at Greenwich Point, Connecticut

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.



Reduce Water Usage

Lighten the load at overtaxed water treatment plants and reduce wear and tear on pipes.



Plant Native

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



Maintain Your Sewers

Private sewer lines and septic systems should be regularly inspected, repaired, and pumped out. Install septic systems that remove nitrogen.



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.



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.



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.

www.SoundHealthExplorer.org

This Report Card provides a geographic assessment of annual Long Island Sound ecosystem health for 2019. It was produced by Save the Sound and made possible thanks to generous funding from the John and Daria Barry Foundation. Data collection was funded by EPA's Long Island Sound Study. Science direction was provided by Jamie Vaudrey, Ph.D. and Jason Krumholz, Ph.D. Document printed on a wind-powered press with renewable energy, post-consumer recycled paper, and vegetable-based inks.

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