

Inner Hempstead Harbor Report Card



What makes up Hempstead Harbor?

Key geographic features



- | | | |
|----------------------------|-----------------------------|----------------------------|
| Tidal flushing | Boat clubs | Marina |
| Shellfish harvest area | Restaurants | Barge |
| Commercial area | Golf course | Jetty |
| Falaise historic house | Power plant | Roads |
| Beaches | Fuel storage | Railroad |
| Wastewater treatment plant | Mud flats (during low tide) | Closed and capped landfill |



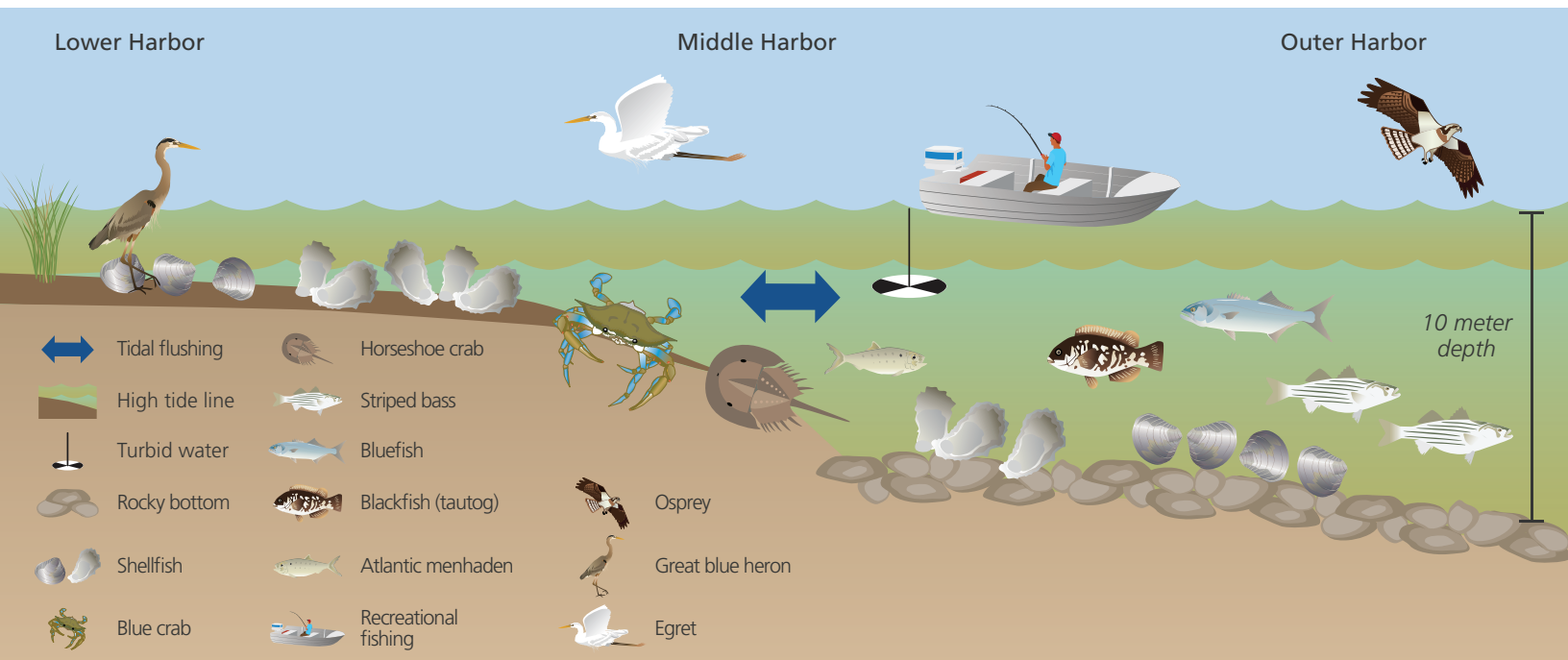
The Lower Harbor, looking at the western shore towards the viaduct. Photo: James Moriarty.

Hempstead Harbor is a v-shaped harbor that lies along the north shore of Long Island, bordering the western portion of Long Island Sound. The Harbor is 5 miles long and encompasses 14 miles of shoreline from Prospect Point on the west to Matinecock Point on the east. The Harbor presents a beautiful waterbody that is quiet and uncrowded, though it supports widely mixed uses. The Inner Hempstead Harbor consists of the Middle Harbor, Lower Harbor, and Glen Cove Creek.

The Harbor is economically important to this region. Fuel is transported to Glenwood Landing oil and gas terminal adjacent to a power plant. Farther north, tugboats tow barges to and from a sand and gravel transfer station on the western shore of the Harbor, and an asphalt plant near the head of Glen Cove Creek, which flows from the Harbor's eastern shore.

Historically, Hempstead Harbor's "working harbor" activities have coexisted with recreational activities. The marinas, yacht clubs, and fishing clubs, concentrated in the middle of the Harbor, continue to thrive. Beaches along the Harbor's shores contrast with the Harbor's commercial sites.

Key processes and species



Making sense of beach and shellfish closures

Closures of shellfishing areas and swimming beaches limit the amount of recreation in Hempstead Harbor; however, these closures are important in protecting human health. In Hempstead Harbor, the Nassau County Department of Health (NCDH) and the New York State Department of Environmental Conservation (NYSDEC) determine whether swimming beaches and shellfish beds are opened or closed. Both agencies use bacteria levels to determine whether temporary or extended closures are required. Different types of bacteria and standards apply because human health can be at risk either by contact with water (swimming) or by eating shellfish.

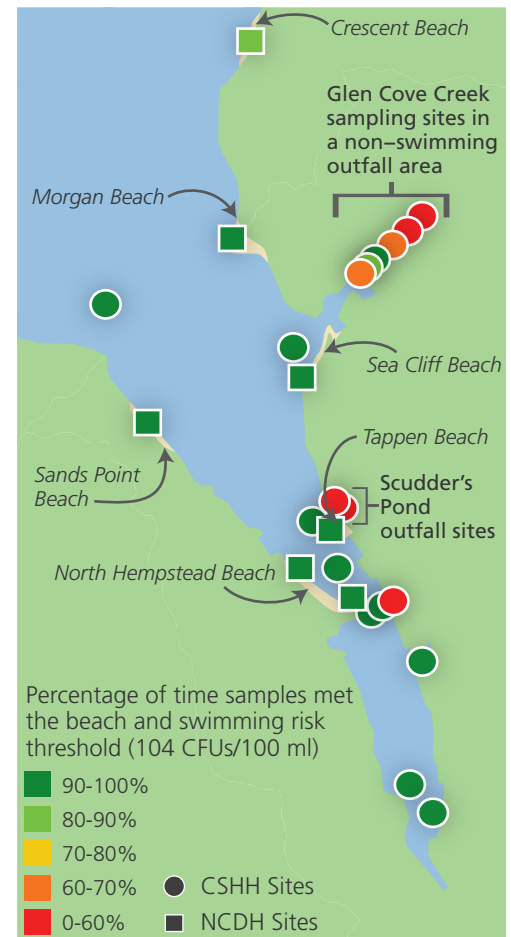
During the beach season, NCDH measures levels of Enterococci bacteria, twice weekly at public beaches. These bacteria are typically found in humans and other warm-blooded animals, and are used as indicators of fecal contamination that may have an adverse effect on human health. Beach closures occur:

1. If levels of Enterococci bacteria exceed state health standards.
2. As a precautionary measure following a half-inch or more of rainfall within a 24-hour period. Bacteria levels in the Harbor can rise as a result of runoff during rainstorms, so although bacteria may not exceed safety standards during these times, beaches are closed to protect public health. These closures allow time for the NCDH to obtain testing results; when safety standards are met, beaches are reopened.

If a beach has an ongoing source of contamination, it can be closed indefinitely until conditions improve, as has been the case for Crescent Beach. Because of consistently high bacteria levels from a stream that runs down to the beach, Crescent Beach has remained closed since 2009, and efforts are focused on resolving the problems of failing septic systems upstream of the beach.

For monitoring shellfish areas (clams, oysters, and mussels), NYSDEC measures levels of fecal coliform, which can indicate the presence of more harmful organisms. NYSDEC also monitors the presence of harmful algal blooms that have an effect on shellfish and can pose a health risk to people who eat the affected shellfish. Shellfish-bed closures occur:

1. As a precautionary measure following a heavy rainfall; the threshold is three inches of rain or more within 24 hours.
2. If a harmful algal bloom is present that produces toxins that cause paralytic shellfish poisoning, or if there is an outbreak of *Vibrio*, a naturally occurring bacteria that is also harmful to humans if the shellfish are consumed.



NCDH monitors bacteria levels from the shore at swimming beaches. The Coalition to Save Hempstead Harbor (CSHH) collects bacteria samples at in-harbor sites as well as from outfalls in the harbor, creek, and pond. All of the sites in swimming areas passed 90–100% of the time, except for the northernmost site.



Hard clams are harvested in Hempstead Harbor (left). Harry Tappen Pool, Beach, and Marina is a popular place for recreating and swimming (right). Photos: Carol DiPaolo (left) and Joel Ziev (right).



Harbor nitrogen levels & water clarity need improvement

Overall Inner Harbor Health **D+**

Inner Hempstead Harbor scored 67% **D+**. This grade is considered poor. Dissolved oxygen scored 87% **B+** overall, a moderately good grade. Dissolved inorganic nitrogen scored 76% **C**, a moderate grade and water clarity scored 38% **F**, a very poor grade.

Outer Harbor **ID**

The Outer Harbor subregion was not scored, due to insufficient data collected in this region, with only one sampling site. Because of the importance of shellfishing in this region, new sampling sites are being considered in the future.

Glen Cove Creek **F**

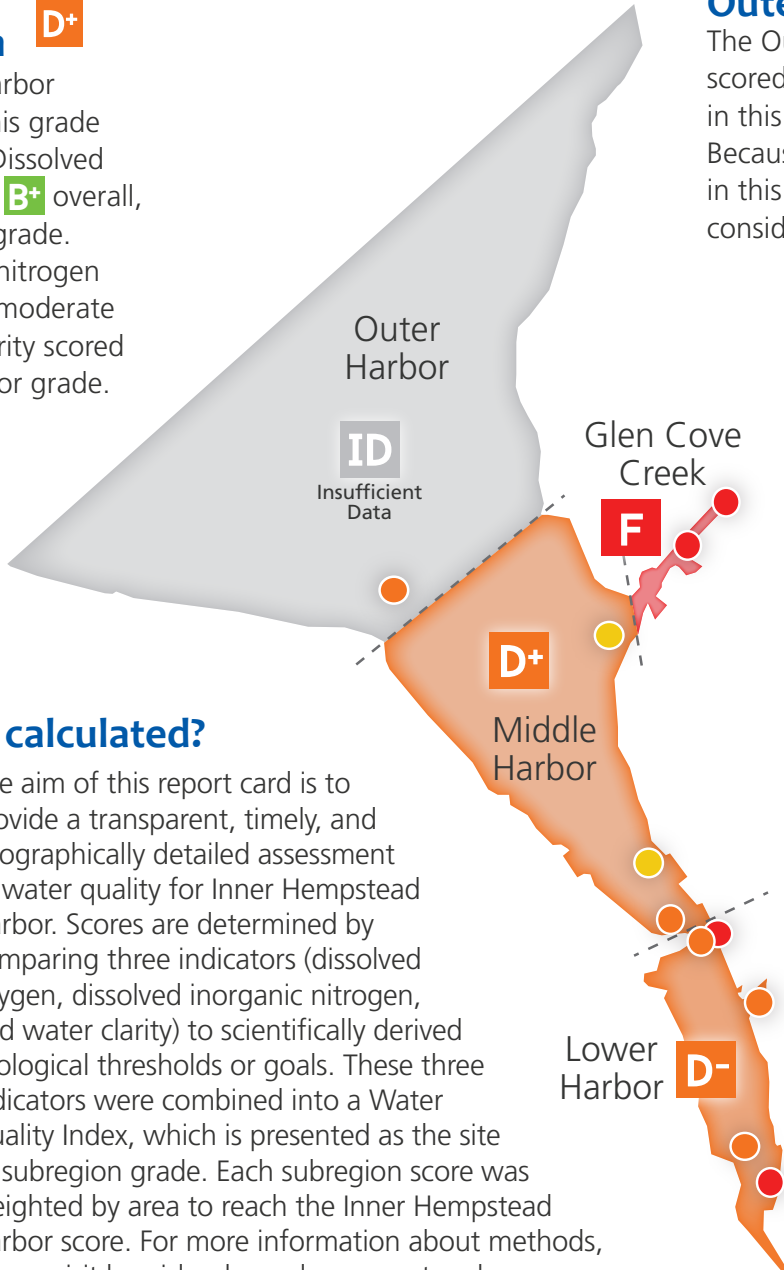
The Glen Cove Creek subregion scored 54% **F**, a very poor grade. Dissolved oxygen scored 82% **B-**, a moderately good grade. Dissolved inorganic nitrogen and water clarity had very poor grades, 52% **F**, and 27% **F**, respectively.

Middle Harbor **D+**

The Middle Harbor subregion scored 69% **D+**, a poor grade. Dissolved oxygen scored 88% **B+**, a moderately good grade and dissolved inorganic nitrogen scored 79% **C+**, a moderate grade. Water clarity scored 41% **F**, a very poor grade.

Lower Harbor **D-**

The Lower Harbor subregion scored 62% **D-**, a poor grade. Dissolved oxygen scored 83% **B**, a moderately good grade. Dissolved inorganic nitrogen scored 70% **C-**, a moderately poor grade. Water clarity scored 31% **F**, a very poor grade.



How is health calculated?



Dissolved oxygen



Dissolved inorganic nitrogen



Water clarity

The aim of this report card is to provide a transparent, timely, and geographically detailed assessment of water quality for Inner Hempstead Harbor. Scores are determined by comparing three indicators (dissolved oxygen, dissolved inorganic nitrogen, and water clarity) to scientifically derived ecological thresholds or goals. These three indicators were combined into a Water Quality Index, which is presented as the site or subregion grade. Each subregion score was weighted by area to reach the Inner Hempstead Harbor score. For more information about methods, please visit longislandsound.ecoreportcard.org.



90–100%: All water quality indicators meet desired levels. Quality of water in these locations tends to be very good, most often leading to preferred habitat conditions for aquatic plants and animals.



80–90%: Most water quality indicators meet desired levels. Quality of water in these locations tends to be good, often leading to acceptable habitat conditions for aquatic plants and animals.



70–80%: There is a mix of good and poor levels of water quality indicators. Quality of water in these locations tends to be fair, leading to sufficient habitat conditions for aquatic plants and animals.



60–70%: Some or few water quality indicators meet desired levels. Quality of water in these locations tends to be poor, often leading to degraded habitat conditions for aquatic plants and animals.



0–60%: Very few or no water quality indicators meet desired levels. Quality of water in these locations tends to be very poor, leading to unacceptable habitat conditions for aquatic plants and animals.




Insufficient Data (ID) is a designation used for areas where there is either insufficient or no data to give a grade on desired health levels.

Indicators of Harbor Health

The Inner Hempstead Harbor report card is an evaluation of water quality in the Inner Harbor which consists of the Middle Harbor, Lower Harbor, and Glen Cove Creek. There are currently three water quality indicators used to evaluate health: dissolved oxygen, dissolved inorganic nitrogen, and water clarity. Each of these indicators is important when using water quality to determine ecosystem health.

DO **N**  Overall Grade

	DO	N		Overall Grade
Glen Cove Creek	82%	52%	27%	54%
Middle Harbor	88%	79%	41%	69%
Lower Harbor	83%	70%	31%	62%
Overall Inner Hempstead Harbor	87%	76%	38%	67%



Dissolved oxygen (DO) is a key indicator of ecosystem health. Nearly all aquatic animals need adequate DO in the water to survive. DO is biologically essential for benthic and fish community health. Even aquatic plants can be harmed if the water around their roots is low in DO. Low dissolved oxygen levels can also cause changes in water chemistry that may trigger the release of nutrients from sediments into the water column.



Dissolved inorganic nitrogen is an essential nutrient for all plants and animals and naturally occurs in the environment and water systems. However, due to human activities, nitrogen is entering water systems at unsustainably high rates. Nitrogen may enter water systems from sources such as agricultural practices, septic systems, sewer overflows, and wastewater treatment plants. As part of the nitrogen cycle, phytoplankton and macroalgae use nitrogen during photosynthesis for growth. When nitrogen is present in excess, algae overgrowth may occur, resulting in an algal bloom that eventually dies and decays—a process that uses up dissolved oxygen, which can lead to very low dissolved oxygen levels and subsequent fish kills.



Water clarity is a measure of how much light penetrates through the water column. It is dependent upon the amount of suspended particles (e.g., sediment and plankton) and colored organic matter present. Clear water is critical for the growth and survival of aquatic grasses, as well as fish, crabs, and other aquatic organisms. Poor water clarity is usually caused by a combination of excess suspended sediments from runoff from the land and the growth of phytoplankton, which is fueled by nutrients.

Positive actions are improving the watershed



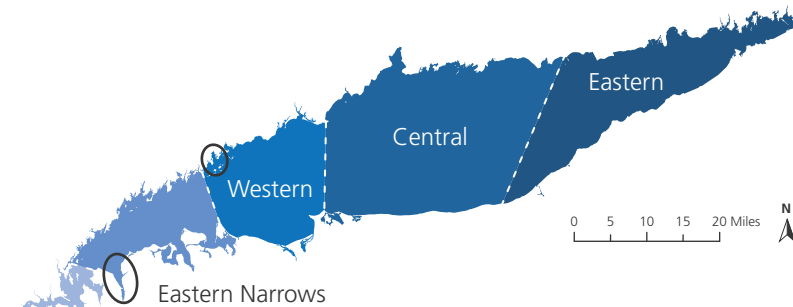
Volunteers brave rainy weather to help out at a beach cleanup at Tappen Beach. Photo: Carol DiPaolo.

The Coalition to Save Hempstead Harbor, a nonprofit environmental organization, was formed in 1986 in response to signs of environmental degradation in and around Hempstead Harbor. It established the Hempstead Harbor water monitoring program in 1992 as a vehicle for public education and outreach and to encourage community residents to participate in restoration efforts. In 1999, the program was used to implement water monitoring recommendations of the Water Quality Improvement Plan for Hempstead Harbor, which was prepared for the Hempstead Harbor Protection Committee, a municipal organization formed in 1995.

The Hempstead Harbor Protection Committee includes nine municipalities, which joined together to clean up the Harbor. The community-based monitoring program, along with other efforts of the Hempstead Harbor Protection Committee, the Coalition to Save Hempstead Harbor, and other stakeholders and partners, resulted in a major success in 2011 when shellfish beds were reopened. These beds were reopened based on water quality improvements, after having been closed for over 40 years. Today, people who use Hempstead Harbor for swimming, fishing, and boating see improvements in the Harbor's habitat and enjoy the marine life and birds that are supported by it.

Bringing the pieces together across Long Island Sound

The Inner Hempstead Harbor report card is part of a larger effort to assess Long Island Sound health on an annual basis. Long Island Sound has been studied for many years, with a variety of reporting frameworks (e.g., State of the Sound) in place to communicate Sound health. However, an ecosystem health report card approach synthesizes environmental data annually, so that citizens and decision makers can evaluate the overall effects of restoration, conservation, and management activities on water quality and ecosystem condition. There are numerous local programs in small embayments throughout Long Island Sound that monitor water quality and other indicators on a more focused scale than is conducted by state and federal governments. As these embayment monitoring programs grow, their data become increasingly valuable to tell the story of annual Long Island Sound



Western Narrows
 Eastern Narrows
 The Long Island Sound and embayment report cards will provide a picture of overall health. Circles on the map show the locations of two embayments.

ecosystem health. Bringing embayment report cards together with the Long Island Sound report card communicates a complete picture of ecosystem health in the area.

How you can help



- Properly dispose of harmful chemicals—avoid pouring them down the sink or storm drains



- Reduce fertilizer use on lawns and gardens in the summer and don't fertilize from November to April



- Reduce water use on your lawn



- Pick up after your pets



- Maintain your septic system (have it pumped every three years)



- Pick up litter on beaches, parking lots, or roadways, and help with beach cleanups



- Use boat pump-out facilities and install a boat "fuel whistle"



- Build and use a compost bin



- Create a rain garden



- Avoid feeding ducks and geese

About the Inner Hempstead Harbor report card



Key participants at a workshop to develop the Inner Hempstead Harbor report card.
 Photo: Anthony Kung.

For information on specific methodologies, indicators, thresholds and subregion designations, visit longislandsound.ecoreportcard.org. This report card was produced by the Coalition to Save Hempstead Harbor, the Hempstead Harbor Protection Committee, and the Integration & Application Network at the University of Maryland Center for Environmental Science and published in June 2015. Funding was provided by the Long Island Sound Funders Collaborative. The report card provides a geographically specific assessment of Inner Hempstead Harbor health for 2013. For more information please contact Carol DiPaolo at (516) 801-6792 and cshh@optonline.net or Eric Swenson at (516) 677-5921 and hempsteadharbor@yahoo.com. Cover photo: Carol DiPaolo.

