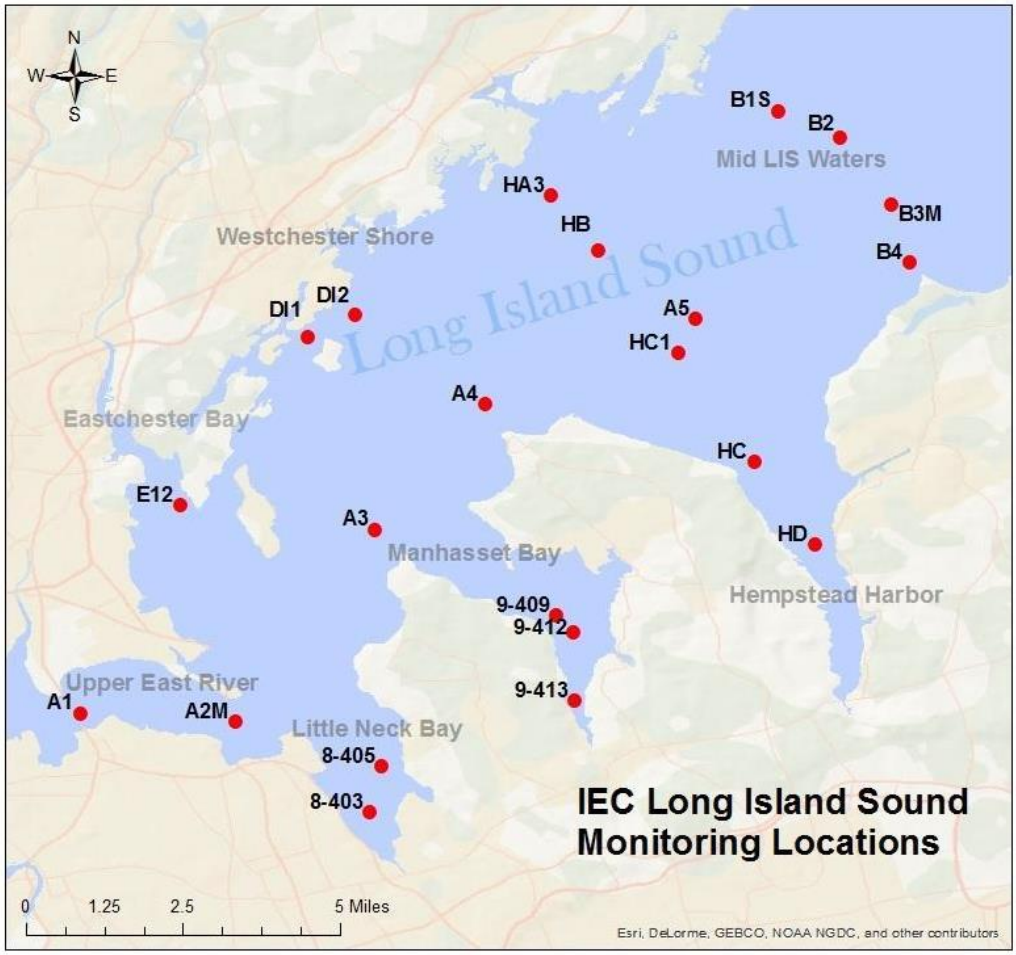
Western Long Island Sound Monitoring
2024 Summer Survey Bi-Weekly Summary
Surveys #9 & #10
Survey Dates: August 20, 2024 & August 27, 2024



STATION	LATITUDE DD	LONGITUDE DD
E-12	40.8487	-73.8045
A1	40.8013	-73.8268
A2M	40.7992	-73.7913
8-403	40.7778	-73.7608
8-405	40.7888	-73.7582
A3	40.8433	-73.7590
9-409	40.8240	-73.7175
9-412	40.8200	-73.7135
9-413	40.8041	-73.7133
A4	40.8725	-73.7343
A5	40.8923	-73.6853
B1S	40.9403	-73.6667
B2	40.9343	-73.6520
B3M	40.9187	-73.6403
B4	40.9054	-73.6360
DI1	40.8883	-73.7748
DI2	40.8930	-73.7642
H-A3	40.9207	-73.7187
H-B	40.9080	-73.7090
H-C	40.8590	-73.6717
H-C1	40.8853	-73.6903
H-D	40.8402	-73.6572

Table 1. List of IEC sites and coordinates.

As a part of the Long Island Sound Study's ongoing water quality monitoring program, IEC started its 34th consecutive summer of weekly ambient monitoring surveys in western Long Island Sound and the upper East River on Tuesday, June 25th, 2024.

Throughout the summer of 2024, IEC staff will perform 12 weekly surveys at each of the 22 stations in the far western Long Island Sound to assess seasonal hypoxic conditions. Hypoxia occurs when dissolved oxygen ("DO") concentrations become low. Marine organisms need oxygen to live and low oxygen concentrations can have serious consequences for a marine ecosystem.

The 12 surveys include weekly *in situ* measurements of water temperature, salinity, dissolved oxygen, pH, turbidity, and Secchi disk depth. Measurements at each station are taken half a meter below the surface, at mid-depth, and half a meter above the bottom.

Interstate Environmental Commission
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Biweekly surveys will include collection of additional samples for parameters relevant to hypoxia at 11 of the 22 stations (stations listed in **bold** in Table 1). These samples will be analyzed for nutrients, Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS), and chlorophyll *a*, in addition to the suite of *in situ* parameters listed above.

Nutrient parameters that will be analyzed include Ammonia, Nitrate+Nitrite, Particulate Nitrogen, Orthophosphate/DIP, Total Dissolved Phosphorus, Particulate Phosphorus, Dissolved Organic Carbon, Particulate Carbon, Dissolved Silica, and Biogenic Silica.

In October 2022, IEC also began collecting dissolved inorganic carbon (DIC) and Total Alkalinity samples to monitor coastal acidification. In aquatic ecosystems, **DIC** acts as a source of carbon for photosynthesis and has a function in controlling the pH. Increasing levels of anthropogenic CO_2 gas emissions are leading to coastal acidification, which can pose a significant threat to marine life, including calcifying organisms like corals and shellfish that make hard shells and skeletons by combining calcium and carbonate from seawater. **Total Alkalinity** is the capacity of water to resist (buffer against) a change in pH when acidity is added. As CO_2 from the atmosphere and from decay of algal blooms increases in LIS, Total Alkalinity guards against pH changes and coastal acidification.

Proposed 2024 Summer Schedule		
Date	**Survey Number**	**Parameters**
06/25/2024	**1**	***In situ*, nutrients, chlorophyll a, BOD, TSS, Total Alkalinity**
07/02/2024	**2**	***In situ* parameters only**
07/09/2024	**3**	***In situ*, nutrients, chlorophyll a, BOD, TSS, Total Alkalinity**
07/16/2024	**4**	***In situ* parameters only**
07/23/2024	**5**	***In situ*, nutrients, chlorophyll a, BOD, TSS, Total Alkalinity**
07/30/2024	**6**	***In situ* parameters only**
08/06/2024	**7**	***In situ*, nutrients, chlorophyll a, BOD, TSS, Total Alkalinity**
08/13/2024	**8**	***In situ* parameters only**
08/20/2024	**9**	***In situ*, nutrients, chlorophyll a, BOD, TSS, Total Alkalinity**
08/27/2024	**10**	***In situ* parameters only**
09/05/2024	11	*In situ*, nutrients, chlorophyll a, BOD, TSS, Total Alkalinity
09/09/2024	12	*In situ* parameters only

The view from Station A5 during Survey #9

Manhasset Bay before starting Survey #10

SURVEY #9 AT A GLANCE 08/20/2024

Hypoxia (DO < 3.00 mg/L)	**No station exhibited hypoxia at surface depth** **5 stations exhibited hypoxia at bottom depth:** Westchester Shoreline –H-B Mid-LIS Waters – A4, A5, B2, B3M
Lowest surface DO concentration	3.82 mg/L (Station A2M in the Upper East River)
Lowest bottom DO concentration	2.28 mg/L (Station H-B on the Westchester Shoreline)
Average surface DO concentration	6.22 mg/L
Average bottom DO concentration	4.26 mg/L
Average surface water temperature	23.50 ℃
Average bottom water temperature	23.01 ℃
Average water column ΔT (Surface-Bottom)	0.49 ℃
Average surface salinity	24.56 ppt
Average bottom salinity	25.09 ppt
Lowest surface pH	7.29 (Station A2M in the Upper East River)
Lowest bottom pH	7.28 (Station B3M in Mid-LIS Waters)
Average surface pH	7.65
Average bottom pH	7.42

Survey #9 Narrative Summary

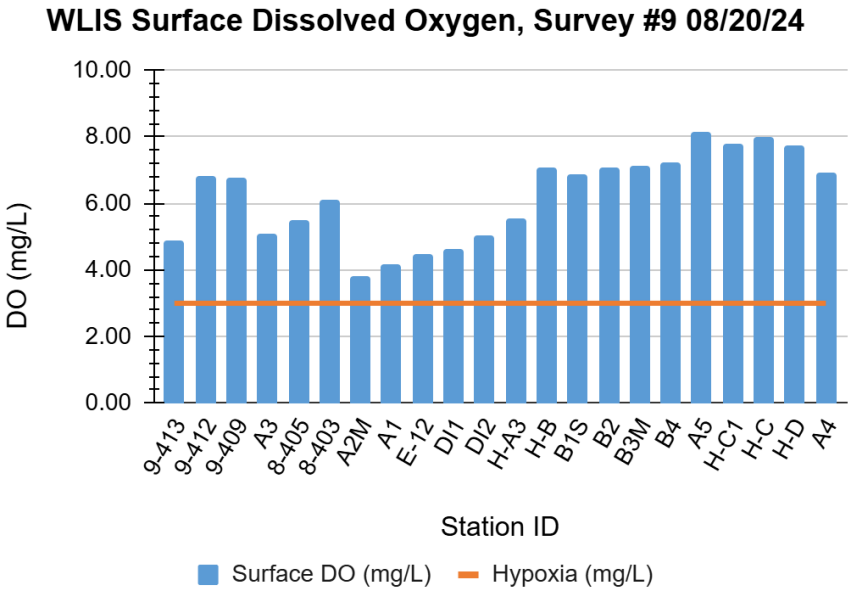
This survey began at 06:32 and ended at 11:58, with the most recent low tide at 06:19 and 06:37 at New Rochelle, NY and Kings Point, NY, respectively. The weather conditions were mostly cloudy with cloud coverage ranging from 5 to 100% during the survey. The average air temperature was 67°F. The weather station at LaGuardia Airport reported a total of 0.08" and 1.65" of precipitation during the 24- and 48-hour period prior to the start of the survey, respectively. Secchi disk measurements ranged from 1.5 ft in Manhasset Bay and Little Neck Bay to 5.0 ft in the Mid-LIS waters and Westchester Shoreline.

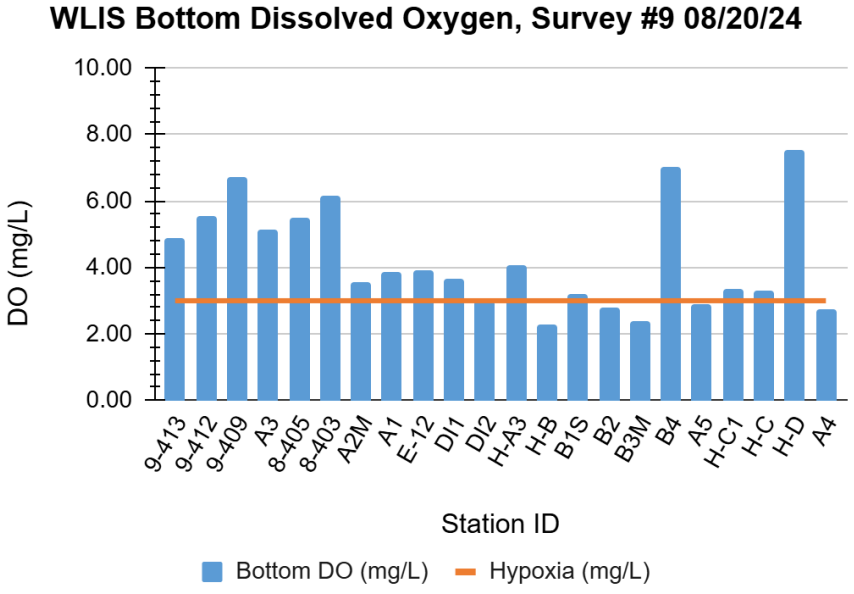
No stations were hypoxic at surface depth and five stations exhibited hypoxia at bottom depth. In comparison, there were zero stations exhibited hypoxia at surface or bottom depths during Survey #9 in 2023. **Average surface and bottom DO concentrations were *lower* during this survey compared to Survey #9 in 2023.** Average Surface DO: 6.22 mg/L in 2024 vs 6.71 mg/L in 2023. Average Bottom DO: 4.26 mg/L in 2024 vs 5.21 mg/L in 2023. **The minimum surface and bottom DO concentrations were also *lower* during this survey compared to last year.** Minimum Surface DO: 3.82 mg/L in 2024 vs 4.79 mg/L in 2023. Minimum Bottom DO: 2.28 mg/L in 2024 vs 3.17 mg/L in 2023.

Average water temperature was *lower* during this survey compared to Survey #9 in 2023 at both surface and bottom depths. Average Surface Temperature: 23.50 ℃ in 2024 vs 23.61 ℃ in 2023. Average Bottom Temperature: 23.01 ℃ in 2024 vs 23.29 ℃ in 2023.

Average salinity was *lower* during this survey compared to Survey #9 in 2023 at both surface and bottom depths. Average Surface Salinity: 24.56 ppt in 2024 vs 25.59 ppt in 2023. Average Bottom Salinity: 25.09 ppt in 2024 vs 25.98 ppt in 2023.

Average pH was *lower* during this survey compared to Survey #9 in 2023. Average Surface pH: 7.65 in 2024 vs 7.67 in 2023. Average Bottom pH: 7.42 in 2024 vs 7.54 in 2023. **The lowest surface and bottom pH *decreased* compared to last year.** Lowest surface pH: 7.29 in 2024 vs 7.38 in 2023. Lowest bottom pH: 7.28 in 2024 vs 7.35 in 2023.

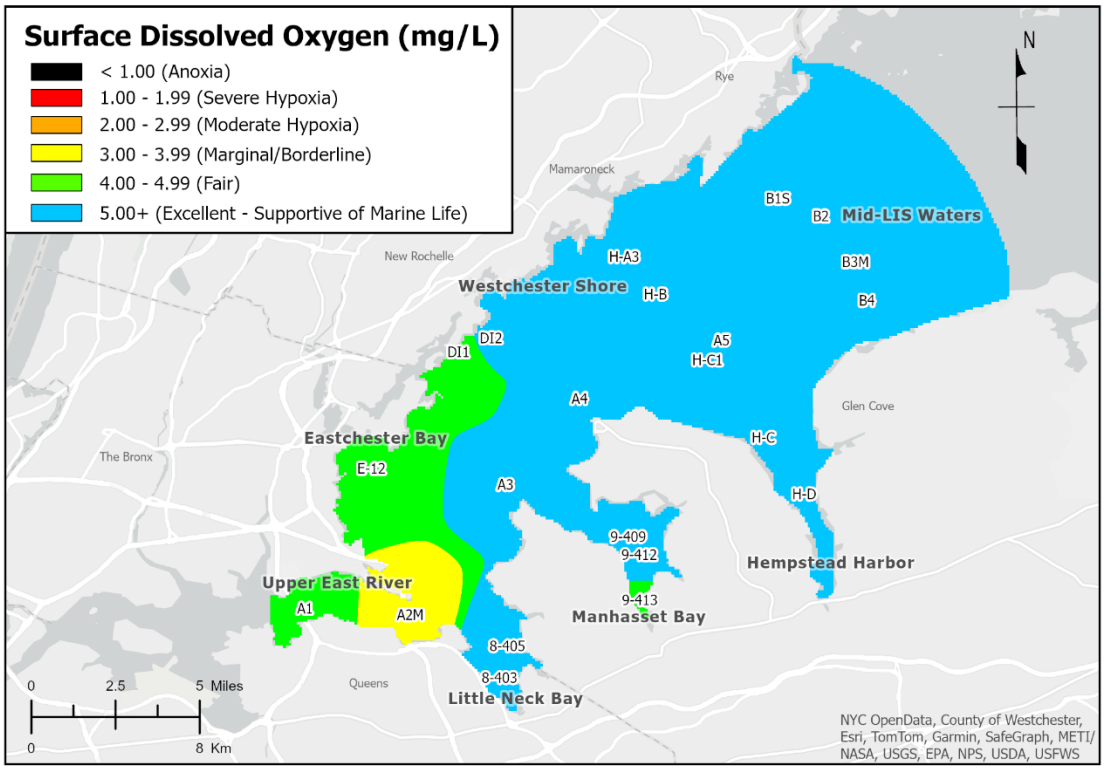


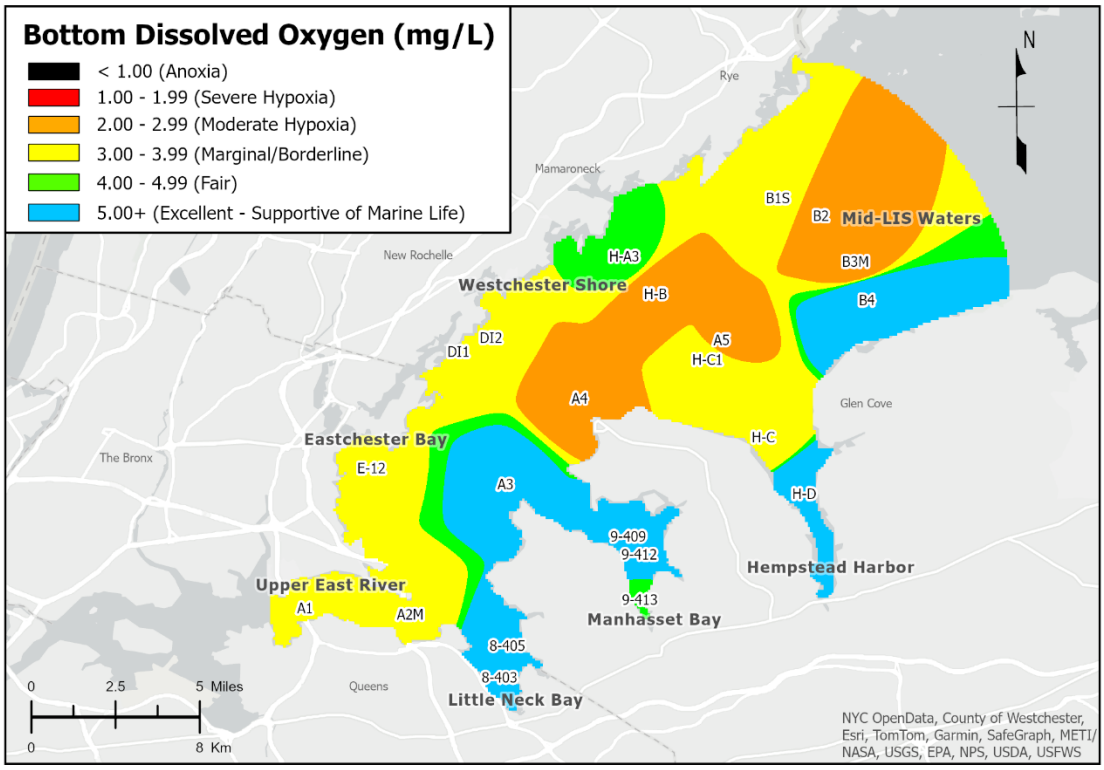


The Long Island Sound Study defines hypoxia as DO values which are below a concentration of 3.00 mg/L.

Interstate Environmental Commission
Ambient Water Quality Monitoring of the Western Long Island Sound

Weekly Survey #9: August 20, 2024





IDW Interpolation, Power 10 | Map by: Jovan Snyder | Map made: 09/12/2024

Survey #10 Narrative Summary

The survey began at 06:37 and ended at 11:37, with the most recent high tide at 06:27 and 06:43 at New Rochelle, NY and Kings Point, NY, respectively. The weather conditions were sunny with 0% cloud coverage throughout the survey. The average air temperature was 74 °F. The weather station at LaGuardia Airport reported a total of 0.00" of precipitation for both the 24- and 48-hour period prior to the start of the survey. Secchi disk measurements ranged from 2.0 ft in Manhasset Bay to 5.0 ft in the Mid-LIS waters.

***In situ* data for this survey is currently under review due to a malfunction with the YSI handheld.**