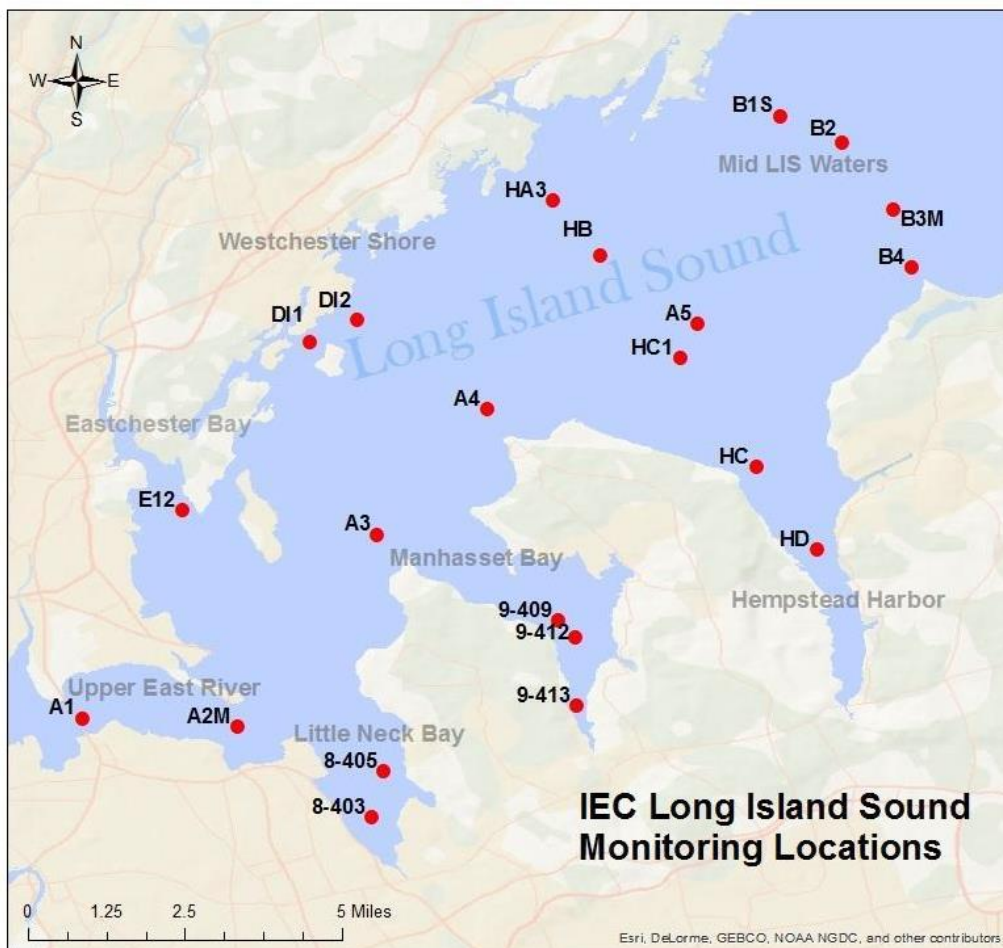




# Western Long Island Sound Monitoring 2024 Summer Survey Bi-Weekly Summary Surveys #7 & #8 Survey Dates: August 6, 2024 & August 13, 2024



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 34<sup>th</sup> consecutive summer of weekly ambient monitoring surveys in western Long Island Sound and the upper East River on Tuesday, June 25<sup>th</sup>, 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  
[www.iec-nynjct.org](http://www.iec-nynjct.org)  
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Brooklyn, NY 11220

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<sub>2</sub> 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<sub>2</sub> 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
<b>06/25/2024</b>	<b>1</b>	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS, Total Alkalinity
<b>07/02/2024</b>	<b>2</b>	<i>In situ</i> parameters only
<b>07/09/2024</b>	<b>3</b>	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS, Total Alkalinity
<b>07/16/2024</b>	<b>4</b>	<i>In situ</i> parameters only
<b>07/23/2024</b>	<b>5</b>	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS, Total Alkalinity
<b>07/30/2024</b>	<b>6</b>	<i>In situ</i> parameters only
<b>08/06/2024</b>	<b>7</b>	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS, Total Alkalinity
<b>08/13/2024</b>	<b>8</b>	<i>In situ</i> parameters only
08/20/2024	9	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS, Total Alkalinity
08/27/2024	10	<i>In situ</i> parameters only
09/05/2024	11	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS, Total Alkalinity
09/12/2024	12	<i>In situ</i> parameters only



Comb jellyfish surrounding the boat at H-C during Survey #7



View of Hempstead Harbor from H-D during Survey #8

## SURVEY #7 AT A GLANCE 08/06/2024

<b>Hypoxia (DO &lt; 3.00 mg/L)</b>	<p><b>2 station exhibited hypoxia at surface depth:</b> Manhasset Bay – 9-413, 9-412</p> <p><b>18 stations exhibited hypoxia at bottom depth:</b> Manhasset Bay – 9-413, 9-412, 9-409 Upper East River – A1, A2M Westchester Shoreline – DI1, DI2, H-A3, H-B Mid-LIS Waters – A3, A4, A5, B1S, B2, B3M, H-C1 Hempstead Harbor – H-C, H-D</p>
<b>Lowest surface DO concentration</b>	0.93 mg/L (Station 9-413 in Manhasset Bay)
<b>Lowest bottom DO concentration</b>	0.76 mg/L (Station 9-413 in Manhasset Bay)
<b>Average surface DO concentration</b>	5.04 mg/L
<b>Average bottom DO concentration</b>	2.37 mg/L
<b>Average surface water temperature</b>	23.97 °C
<b>Average bottom water temperature</b>	21.84 °C
<b>Average water column ΔT (Surface-Bottom)</b>	2.13 °C
<b>Average surface salinity</b>	25.59 ppt
<b>Average bottom salinity</b>	26.33 ppt
<b>Lowest surface pH</b>	6.89 (Station 9-413 in Manhasset Bay)
<b>Lowest bottom pH</b>	6.88 (Station 9-413 in Manhasset Bay)
<b>Average surface pH</b>	7.42
<b>Average bottom pH</b>	7.20

### Survey #7 Narrative Summary

This survey began at 06:22 and ended at 11:40, with the most recent low tide at 07:38 and 07:56 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 84°F. The weather station at LaGuardia Airport reported a total of 0.00” and 0.17” of precipitation during the 24- and 48-hour period prior to the start of the survey, respectively. Secchi disk measurements ranged from 2.0 ft in Manhasset Bay, Little Neck Bay, and Eastchester Bay to 5.5 ft in the Upper East River and Mid-LIS waters.

**Two stations exhibited hypoxia at surface depth and 18 stations exhibited hypoxia at bottom depth.** In comparison, there were zero stations at surface depth and 4 stations at bottom depth that exhibited hypoxia during Survey #7 in 2023. **Average surface and bottom DO concentrations were lower during this survey compared to last year.** Average Surface DO: 5.04 mg/L in 2024 vs 5.62 mg/L in 2023. Average Bottom DO: 2.37 mg/L in 2024 vs 4.65 mg/L in 2023. **The minimum surface and bottom DO concentrations were also lower**

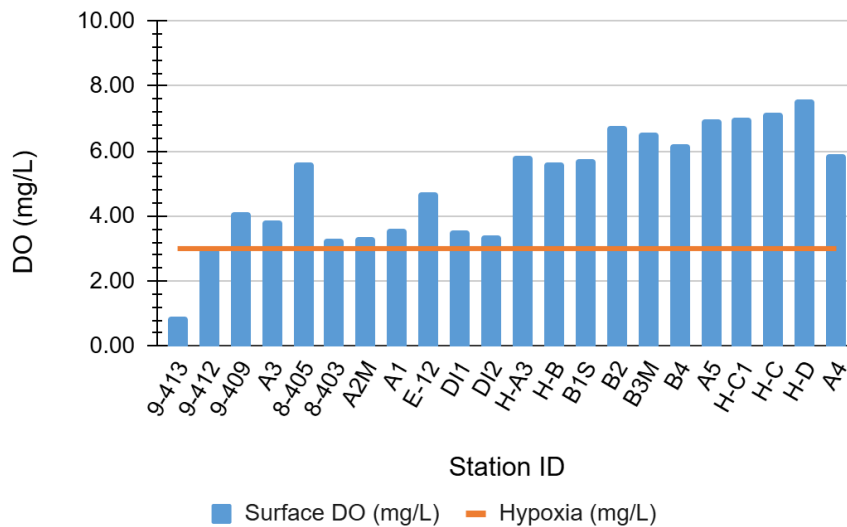
during this survey compared to last year. Minimum Surface DO: 0.93 mg/L in 2024 vs 2.96 mg/L in 2023. Minimum Bottom DO: 0.76 mg/L in 2024 vs 0.63 mg/L in 2023.

Average surface water temperature was *higher* during this survey compared to last year, while the average bottom water temperature was *lower* compared to last year. Average Surface Temperature: 23.97 °C in 2024 vs 22.39 °C in 2023. Average Bottom Temperature: 21.84 °C in 2024 vs 22.14 °C in 2023.

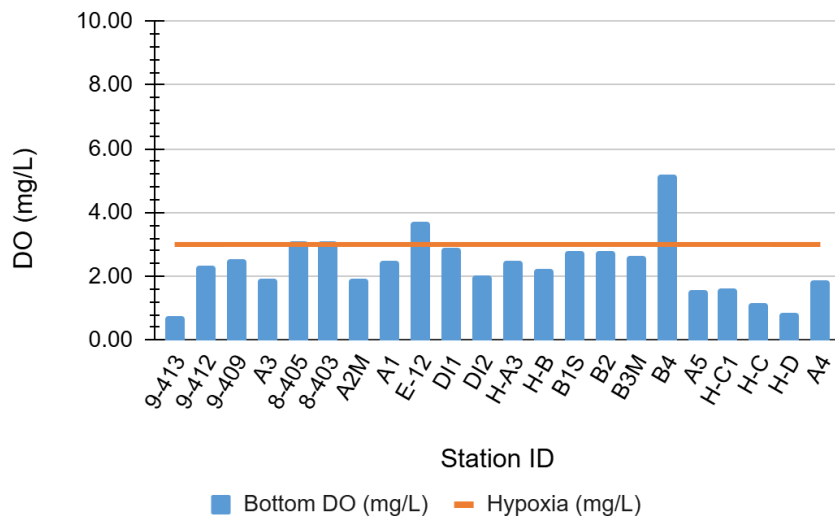
Average surface salinity was *lower* during this survey compared to last year, while average bottom salinity was *higher* compared to last year. Average Surface Salinity: 25.59 ppt in 2024 vs 26.15 ppt in 2023. Average Bottom Salinity: 26.33 ppt in 2024 vs 26.31 ppt in 2023.

Average surface and bottom pH during this survey were *lower* compared to last year. Average Surface pH: 7.42 in 2024 vs 7.52 in 2023. Average Bottom pH: 7.20 in 2024 vs 7.45 in 2023. **The lowest surface and bottom pH decreased compared to last year.** Lowest surface pH: 6.89 in 2024 vs 7.32 in 2023. Lowest bottom pH: 6.88 in 2024 vs 7.23 in 2023.

**WLIS Surface Dissolved Oxygen, Survey #7 08/06/24**



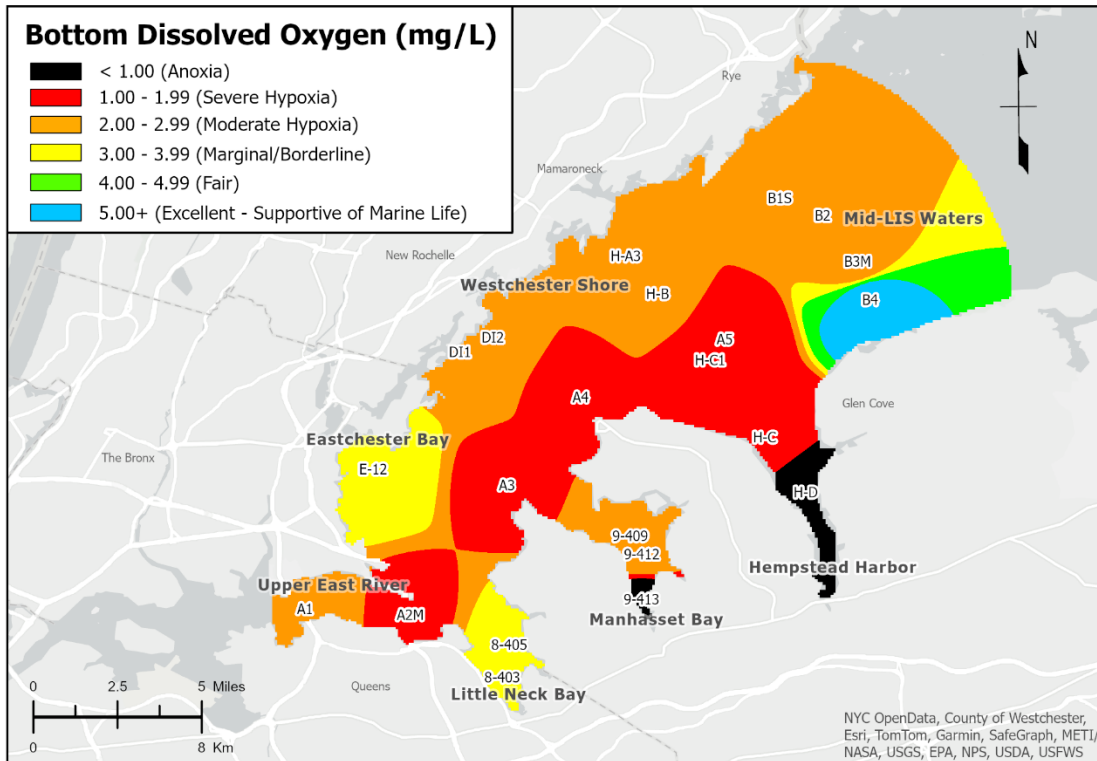
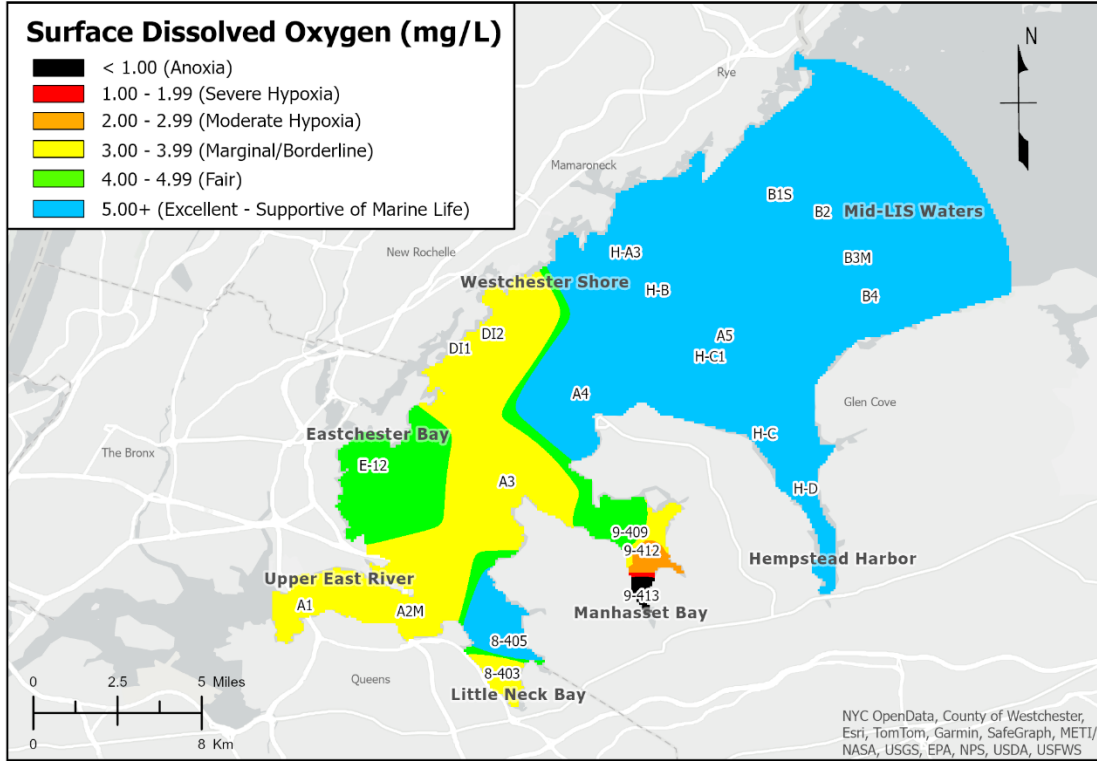
**WLIS Bottom Dissolved Oxygen, Survey #7 08/06/24**



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 #7: August 6, 2024



IDW Interpolation, Power 10

Map by: Jovan Snyder

Map made: 09/05/2024



## SURVEY #8 AT A GLANCE 08/13/2024

<b>Hypoxia (DO &lt; 3.00 mg/L)</b>	<b>2 stations exhibited hypoxia at bottom depth:</b> Mid-LIS Waters –A5, H-C1
<b>Lowest surface DO concentration</b>	4.45 mg/L (Station A2M in the Upper East River)
<b>Lowest bottom DO concentration</b>	2.51 mg/L (Station H-C1 in Mid-LIS waters)
<b>Average surface DO concentration</b>	6.59 mg/L
<b>Average bottom DO concentration</b>	4.67 mg/L
<b>Average surface water temperature</b>	23.26 °C
<b>Average bottom water temperature</b>	22.63 °C
<b>Average water column ΔT (Surface-Bottom)</b>	0.63 °C
<b>Average surface salinity</b>	25.04 ppt
<b>Average bottom salinity</b>	25.69 ppt
<b>Lowest surface pH</b>	7.27 (Stations A1 and A2M in the Upper East River)
<b>Lowest bottom pH</b>	7.20 (Station H-C1 in Mid-LIS waters)
<b>Average surface pH</b>	7.56
<b>Average bottom pH</b>	7.40

### Survey #8 Narrative Summary

The survey began at 06:27 and ended at 11:25, with the most recent high tide at 05:23 and 05:39 at New Rochelle, NY and Kings Point, NY, respectively. The weather conditions were sunny with cloud coverage varying from 0 to 15% throughout the survey. The average air temperature was 72 °F. The weather station at LaGuardia Airport reported a total of 0.01” 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 5.5 ft in the Upper East River and Mid-LIS waters.

**No stations were hypoxic at surface depth and 2 stations exhibited hypoxia at bottom depth.** In comparison, there were zero stations at surface depth and 11 stations at bottom depth that exhibited hypoxia during Survey #8 in 2023. **Average surface and bottom DO concentrations were *higher* compared to last year.** Average Surface DO: 6.59 mg/L in 2024 vs 6.17 mg/L in 2023. Average Bottom DO: 4.67 mg/L in 2024 vs 3.59 mg/L in 2023. **The minimum surface and bottom DO concentration were also *higher* this year compared to last year.** Minimum Surface DO: 4.45 mg/L in 2024 vs 4.37 mg/L in 2023. Minimum Bottom DO: 2.51 mg/L in 2024 vs 1.37 mg/L in 2023.

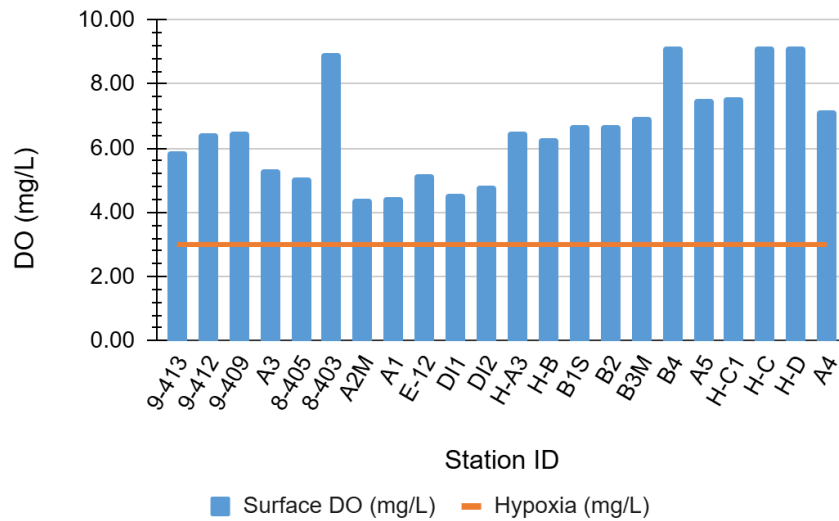
**Average surface water temperature was *lower* during this survey compared to last year, while the average bottom water temperature was *higher*.** Average Surface Temperature: 23.26 °C in 2024 vs 23.50 °C in 2023. Average Bottom Temperature: 22.63 °C in 2024 vs 22.55 °C in 2023.

**Average surface and bottom salinity during this survey were *lower* compared to last year.** Average Surface

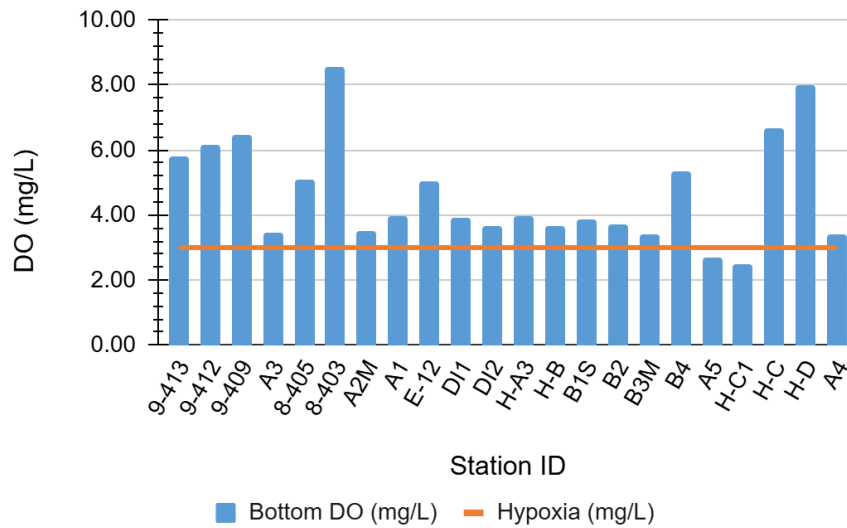
Salinity: 25.04 ppt in 2024 vs 25.76 ppt in 2023. Average Bottom Salinity: 25.69 ppt in 2024 vs 26.40 ppt in 2023.

Average surface pH during this survey was *lower* compared to last year, while the average bottom pH was *higher*. Average Surface pH: 7.56 in 2024 vs 7.63 in 2023. Average Bottom pH: 7.40 in 2024 vs 7.37 in 2023. The lowest surface and bottom pH were both *higher* compared to last year. Lowest surface pH: 7.27 in 2024 vs 7.16 in 2023. Lowest bottom pH: 7.20 in 2024 vs 7.01 in 2023.

**WLIS Surface Dissolved Oxygen, Survey #8 08/13/24**



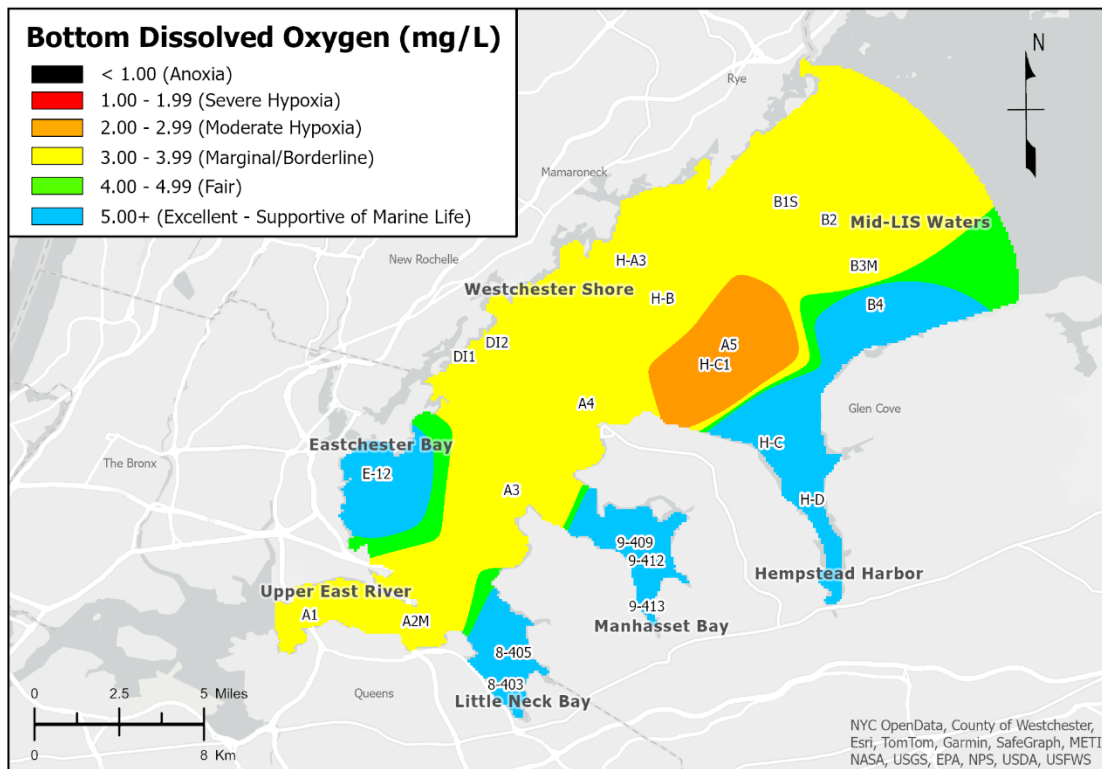
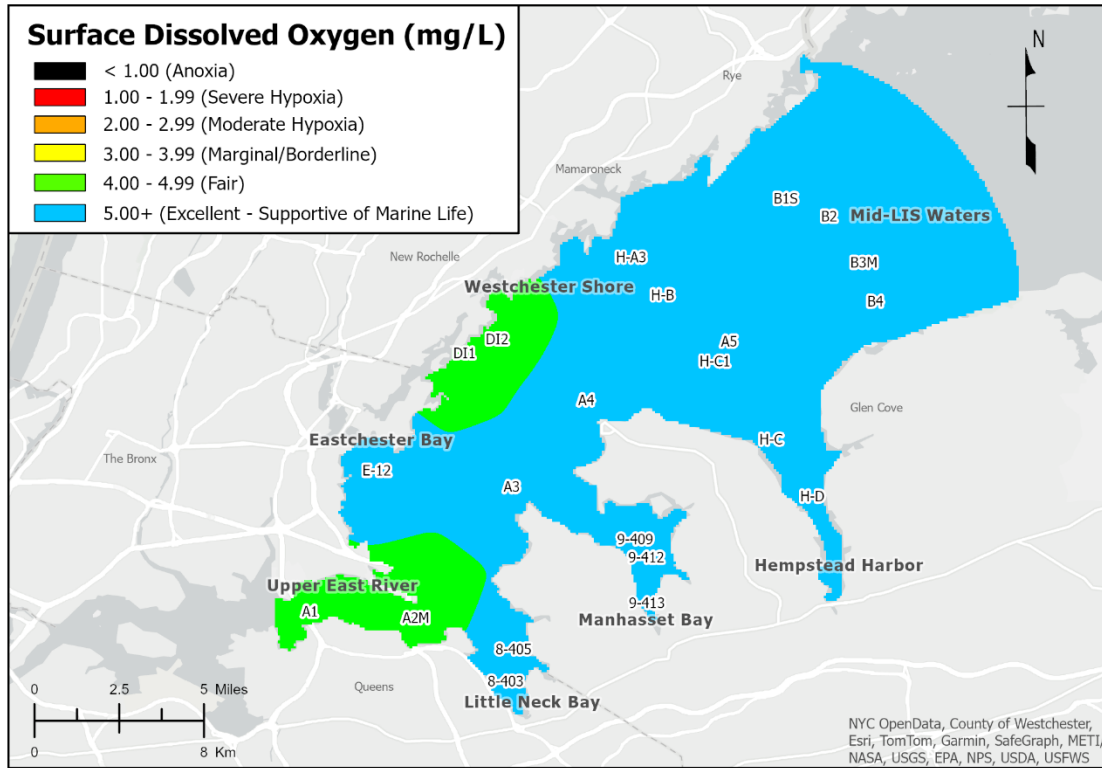
**WLIS Bottom Dissolved Oxygen, Survey #8 08/13/24**



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 #8: August 13, 2024



IDW Interpolation, Power 10

Map by: Jovan Snyder

Map made: 09/05/2024