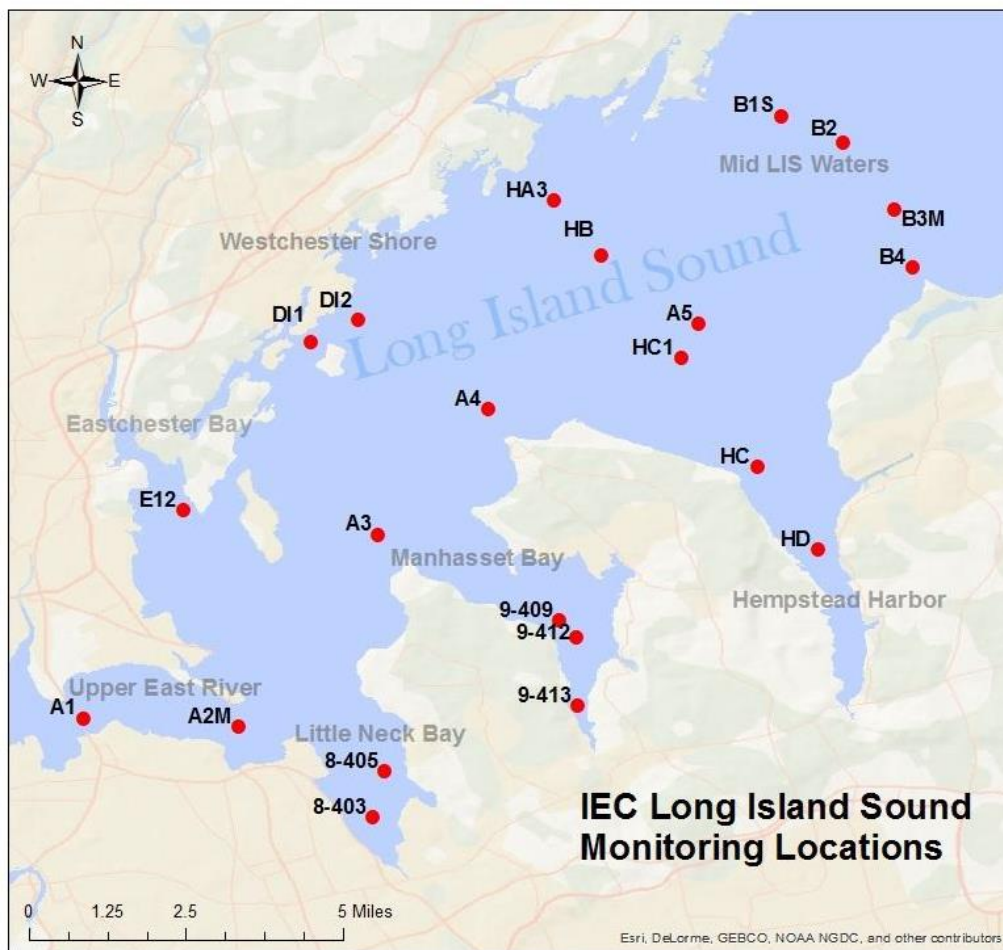


Western Long Island Sound Monitoring 2022 Summer Survey Bi-Weekly Summary Surveys #5 & #6 Survey Dates: July 26, 2022 & August 2, 2022



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

As part of the Long Island Sound Study's ongoing water quality monitoring program, IEC started its 32nd consecutive summer of weekly ambient monitoring surveys in western Long Island Sound and the upper East River on Tuesday, June 28th, 2022.

Throughout summer 2022, IEC staff will perform 12 weekly surveys to each of 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, and Secchi disk depth. This summer, the additional *in situ* parameter of turbidity was included as an intercomparison with 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.

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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** on table, upper right). 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.

Proposed 2022 Summer Schedule		
Date	Survey Number	Parameters
6/28/2022	1	<i>In situ</i> parameters only
7/6/2022	2	<i>In situ</i> , nutrients, chlorophyll <i>a</i> , BOD, TSS
7/12/2022	3	<i>In situ</i> parameters only
7/19/2022	4	<i>In situ</i> , nutrients, chlorophyll <i>a</i> , BOD, TSS
7/26/2022	5	<i>In situ</i> parameters only
8/2/2022	6	<i>In situ</i> , nutrients, chlorophyll <i>a</i> , BOD, TSS
8/12/2022	7	<i>In situ</i> parameters only
8/16/2021	8	<i>In situ</i>, nutrients, chlorophyll <i>a</i>, BOD, TSS
8/23/2022	9	<i>In situ</i> parameters only
8/30/2022	10	<i>In situ</i>, nutrients, chlorophyll <i>a</i>, BOD, TSS
9/6/2022	11	<i>In situ</i> parameters only
9/15/2022	12	<i>In situ</i>, nutrients, chlorophyll <i>a</i>, BOD, TSS



Osprey nest near station A4



Dead bunker fish observed in Manhasset Bay. Bunker fish are an important food source for predatory fish like striped bass, bluefish, and sharks, as well as birds like egrets, ospreys, seagulls, and more. Unfortunately, they are vulnerable to die offs due to lack of oxygen in the water (hypoxia).

SURVEY # 5 AT A GLANCE 07/26/2022

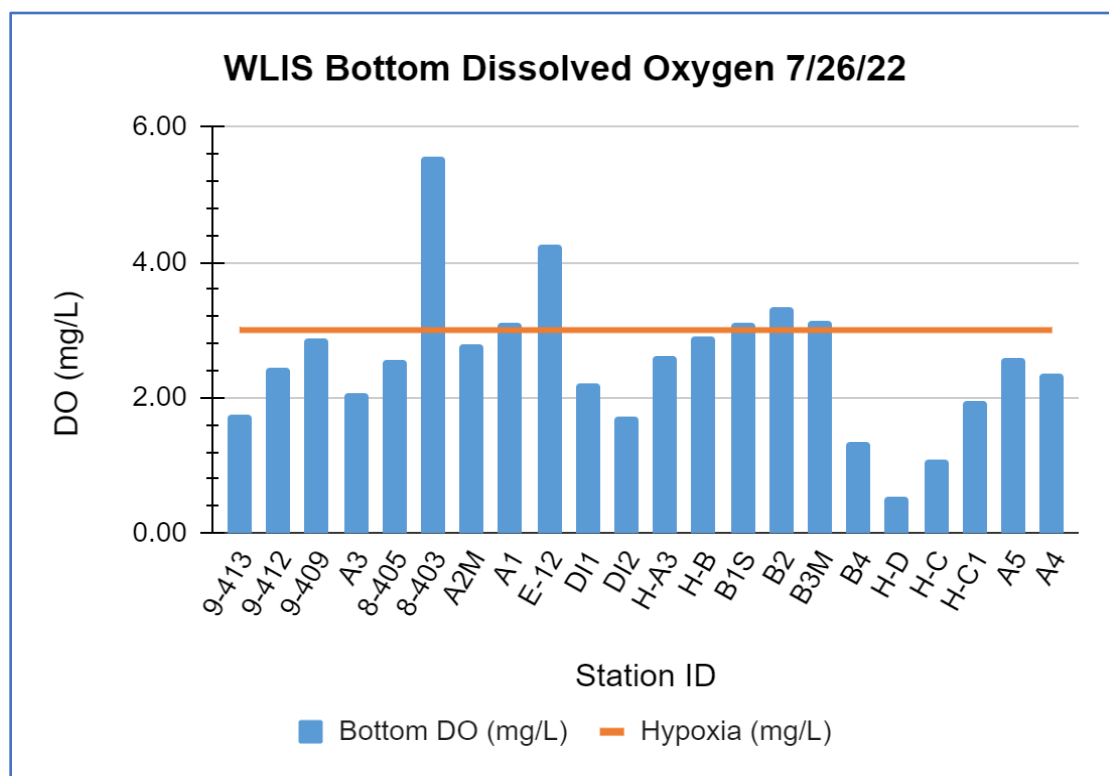
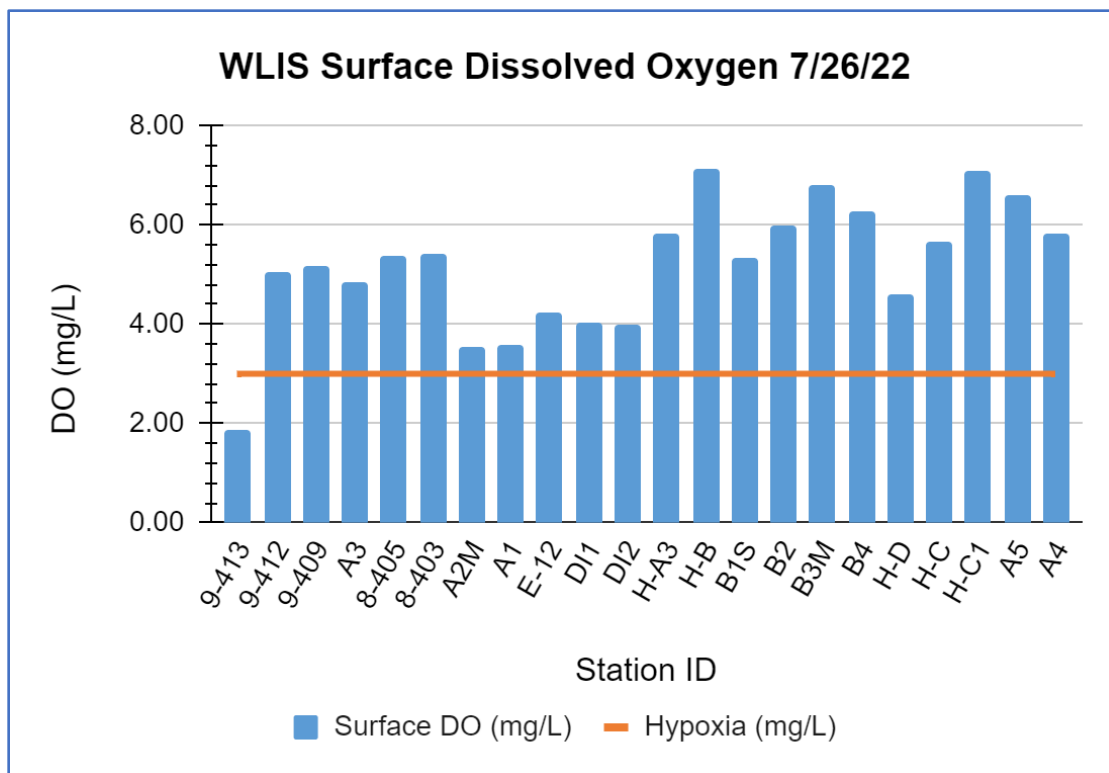
Hypoxia (DO < 3.00 mg/L)	1 station was hypoxic at surface depth: Manhasset Bay – 9-413 16 stations were hypoxic at bottom depth: Manhasset Bay – 9-413, 9-412, 9-409 Little Neck Bay – 8-405 Mid-LIS Waters – A3, B4, H-C1, A5, A4 Upper East River – A2M Westchester Shoreline – DI1, DI2, H-A3, H-B Hempstead Harbor – H-D, H-C
Lowest surface DO concentration	1.85 mg/L (Station 9-413 in Manhasset Bay)
Lowest bottom DO concentration	0.55 mg/L (Station H-D in Hempstead Harbor)
Average surface DO concentration	5.19 mg/L
Average bottom DO concentration	2.56 mg/L
Average surface water temperature	22.16 °C
Average bottom water temperature	20.19 °C
Average water column ΔT	1.97 °C
Average surface salinity	26.46 ppt
Average bottom salinity	27.21 ppt
Lowest surface pH	7.03 (Station 9-413 in Manhasset Bay)
Lowest bottom pH	7.02 (Station 9-413 in Manhasset Bay)
Average surface pH	7.54
Average bottom pH	7.29

Survey #5 Narrative Summary

This survey began at 06:20 and ended at 09:26, with the last low tide at 05:06 and 05:24 at New Rochelle, NY and Kings Point, NY, respectively. The weather was mostly cloudy with percent cloud cover ranging from approximately 0 to 80% across all stations. The average air temperature was 73 °F, wind speed was 6 mph, and we experienced calm waters during the survey. The weather station at LaGuardia Airport reported 0.76" 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 7.5 ft in the Mid-LIS waters.

We observed dead bunker (Menhaden) fish at the surface in Manhasset Bay near the marina.

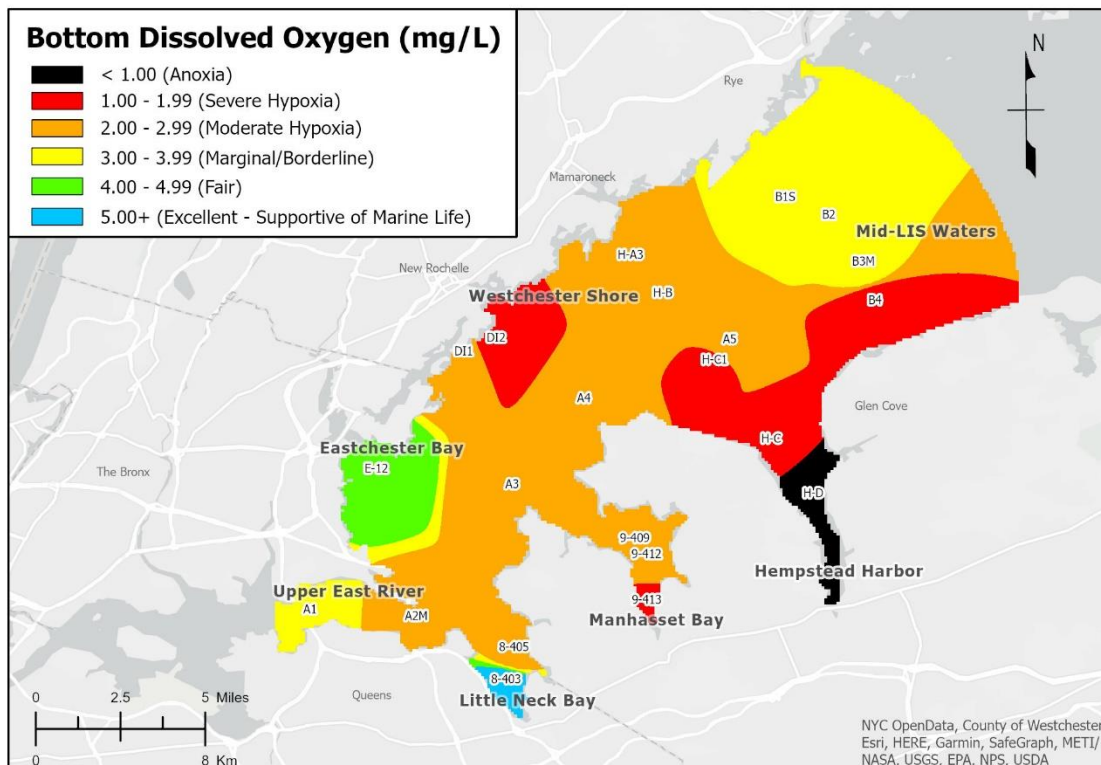
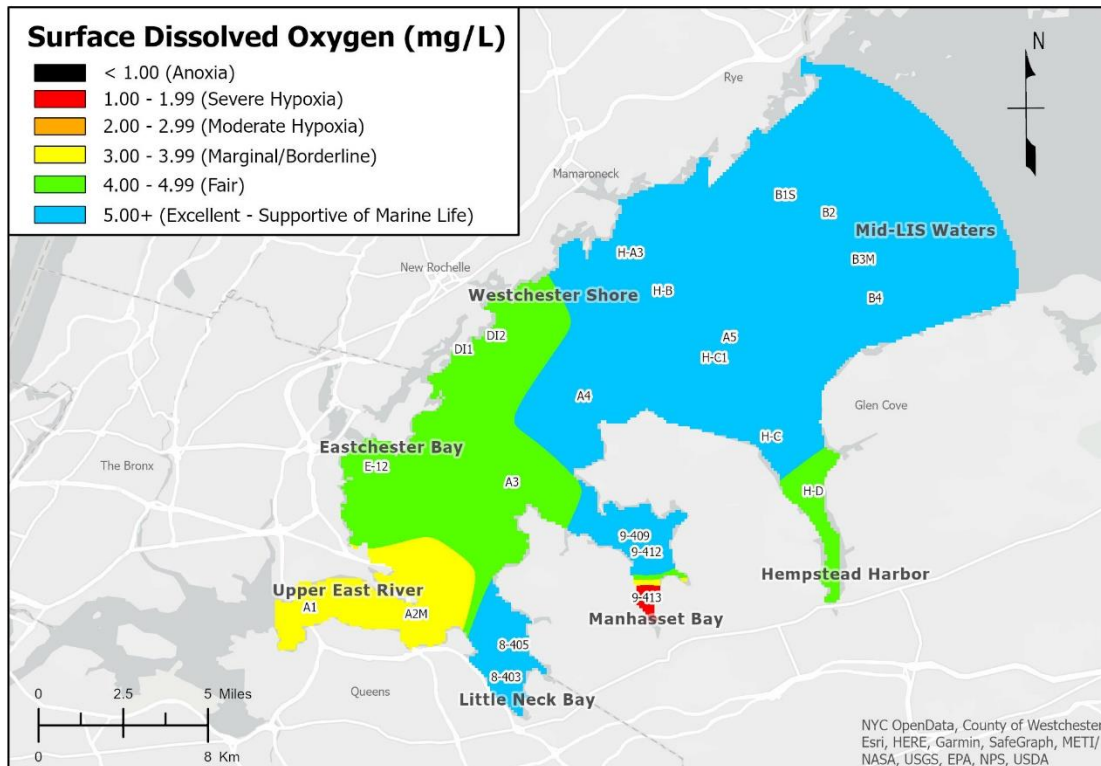
The number of stations that exhibited hypoxia at bottom depth quadrupled since the previous week (Survey #4 on 7/19/22), from 4 to 16: 9-413, 9-412, 9-409, A3, 8-405, A2M, DI1, DI2, H-A3, H-B, B4, H-D, H-C, H-C1, A5, and A4. **Only one station exhibited hypoxia at surface depth:** 9-413. **Station 9-413 was hypoxic at both bottom and surface depths.**



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 #5: July 26, 2022



IDW Interpolation, Power 10

Map by: Kimarie Yap

Map made: 01/23/23

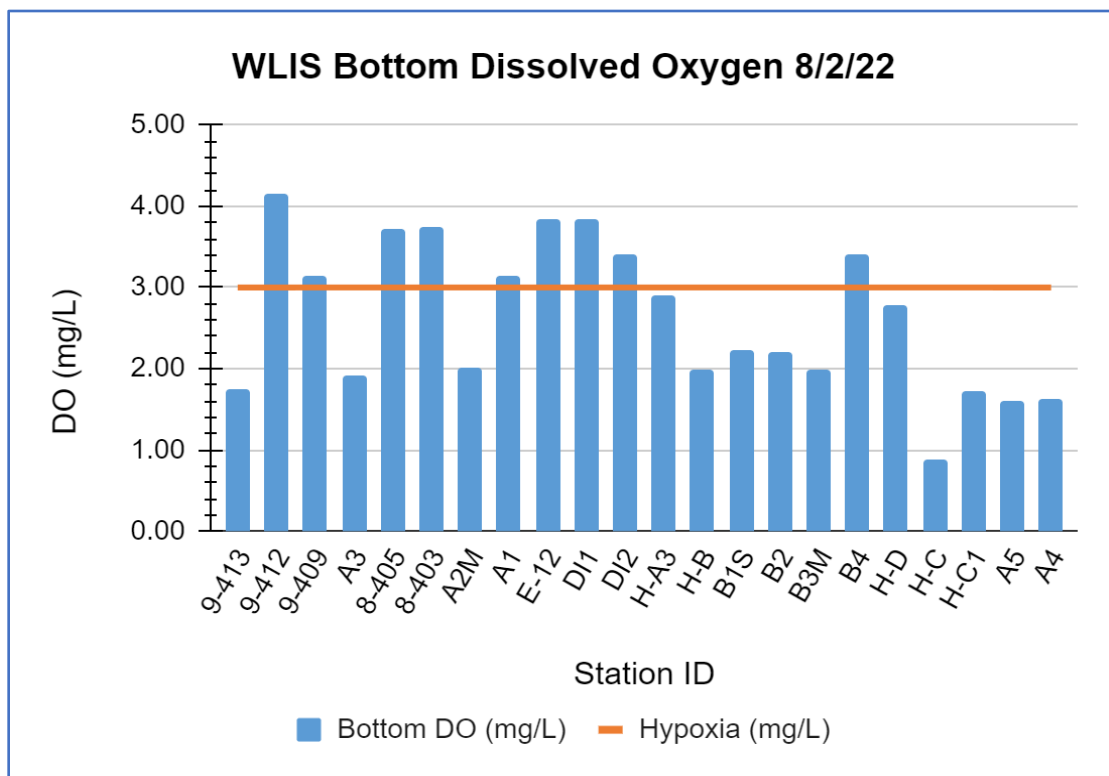
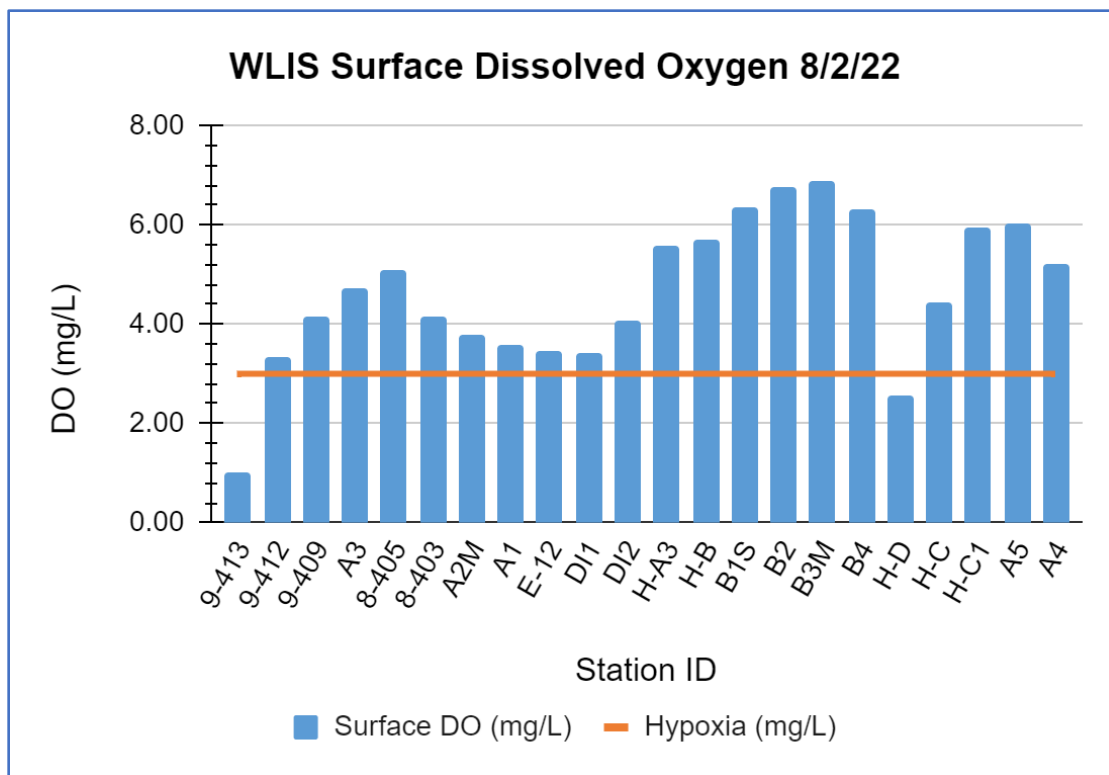
SURVEY # 6 AT A GLANCE 08/02/2022

Hypoxia (DO < 3.00 mg/L)	2 stations were hypoxic at surface depth: Manhasset Bay – 9-413 Hempstead Harbor – H-D 13 stations were hypoxic at bottom depth: Manhasset Bay – 9-413 Mid-LIS Waters – A3, B1S, B2, B3M, H-C1, A5, A4 Upper East River – A2M Westchester Shoreline – H-A3, H-B Hempstead Harbor – H-D, H-C
Lowest surface DO concentration	1.02 mg/L (Station 9-413 in Manhasset Bay)
Lowest bottom DO concentration	0.87 mg/L (Station H-C in Hempstead Harbor)
Average surface DO concentration	4.66 mg/L
Average bottom DO concentration	2.64 mg/L
Average surface water temperature	22.20 °C
Average bottom water temperature	20.87 °C
Average water column ΔT	1.33 °C
Average surface salinity	27.07 ppt
Average bottom salinity	27.50 ppt
Lowest surface pH	7.00 (Station 9-413 in Manhasset Bay)
Lowest bottom pH	7.04 (Station 9-413 in Manhasset Bay)
Average surface pH	7.42
Average bottom pH	7.25

Survey #6 Narrative Summary

The survey began at 06:24 and ended at 09:42, with the last high tide at 02:10 and 02:26 at New Rochelle, NY and Kings Point, NY, respectively. The weather was mostly cloudy, average air temperature was 76 °F, wind speed averaged 7-10 mph, and we experienced calm waters. The percent cloud cover measured approximately 5 to 80% across all stations. The weather station at LaGuardia Airport reported 0.03” and 0.41” of precipitation for the 24- and 48-hour period prior to the start of the survey, respectively. Secchi disk measurements ranged from 3.0 ft in Manhasset Bay to 7.0 ft in the Mid-LIS waters.

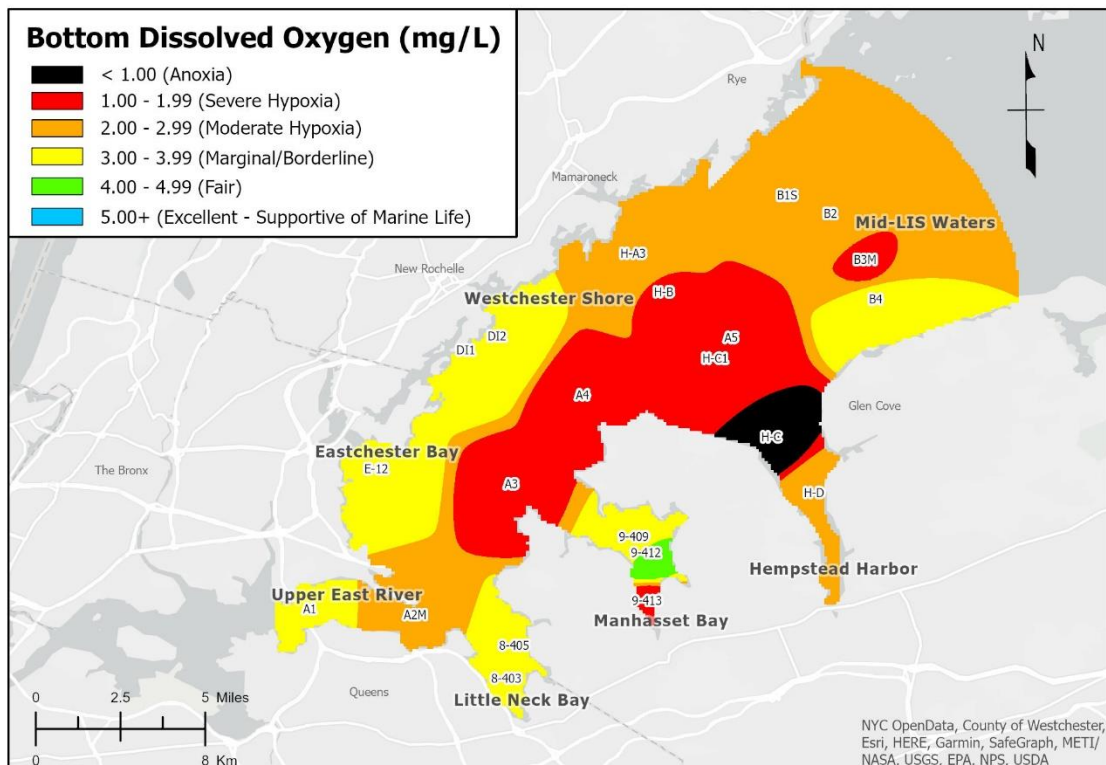
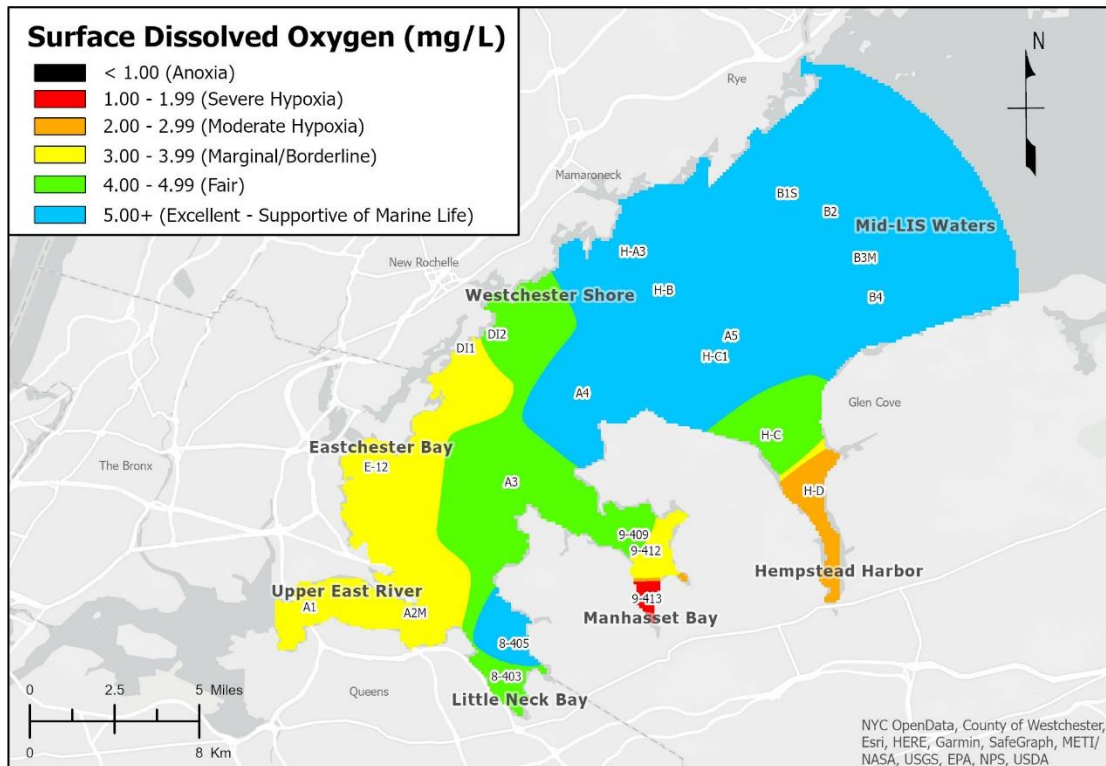
13 stations exhibited hypoxia (DO < 3 mg/L) at bottom depth: 9-413, A3, A2M, H-A3, H-B, B1S, B2, B3M, H-D, H-C, H-C1, A5, and A4. **Two stations exhibited hypoxia at surface depth:** 9-413 and H-D. **Stations 9-413 and H-D exhibited hypoxia at both surface and bottom depths.**



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 #6: August 2, 2022



IDW Interpolation, Power 10

Map by: Kimarie Yap

Map made: 01/23/23