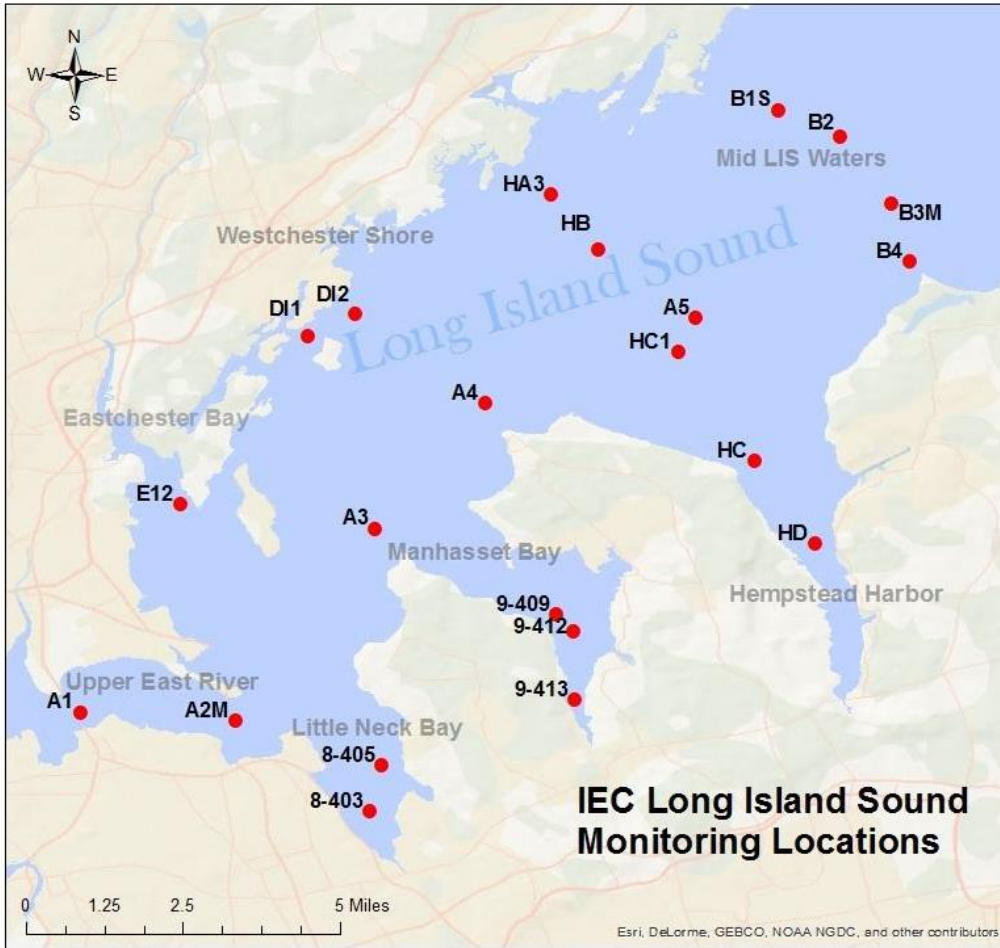




## Western Long Island Sound Monitoring 2022 Summer Survey Bi-Weekly Summary Surveys #9 & #10 Survey Dates: August 23, 2022 & August 30, 2022



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 32<sup>nd</sup> consecutive summer of weekly ambient monitoring surveys in western Long Island Sound and the upper East River on Tuesday, June 28<sup>th</sup>, 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.

<b>Proposed 2022 Summer Schedule</b>		
<b>Date</b>	<b>Survey Number</b>	<b>Parameters</b>
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
<b>9/9/2022</b>	<b>11</b>	<b><i>In situ</i> parameters only</b>
<b>9/15/2022</b>	<b>12</b>	<b><i>In situ</i>, nutrients, chlorophyll <i>a</i>, BOD, TSS</b>



Sunrise at Manhasset Bay



Dead bunker fish kill 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).

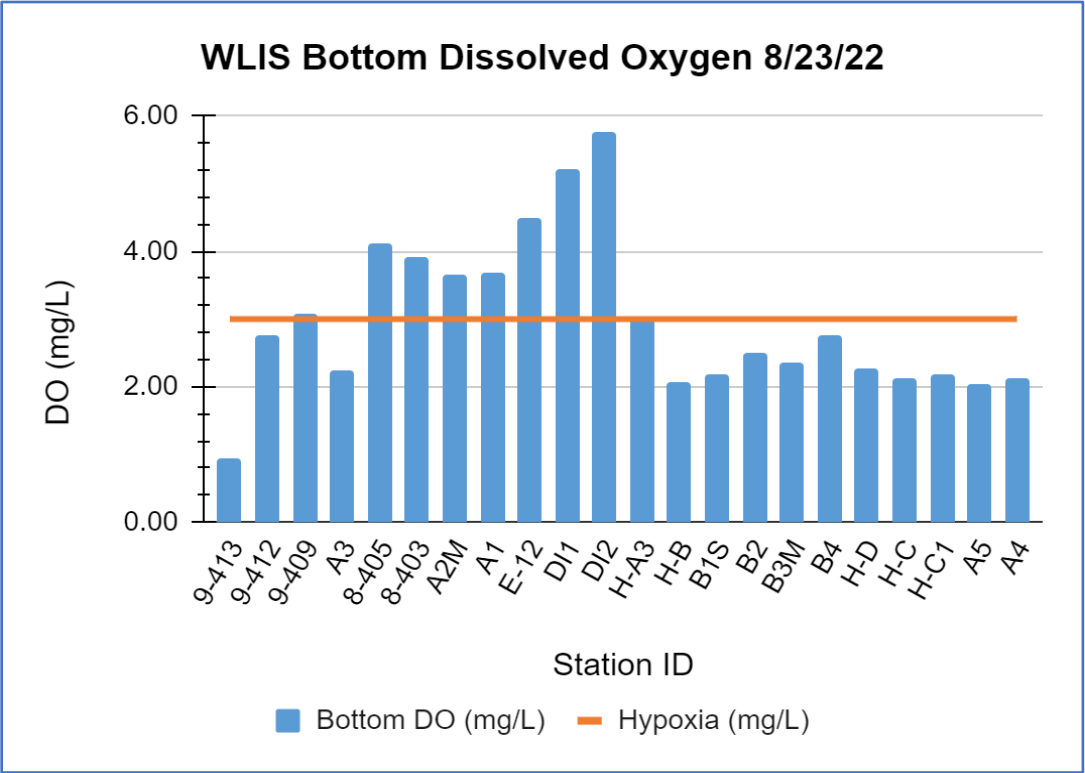
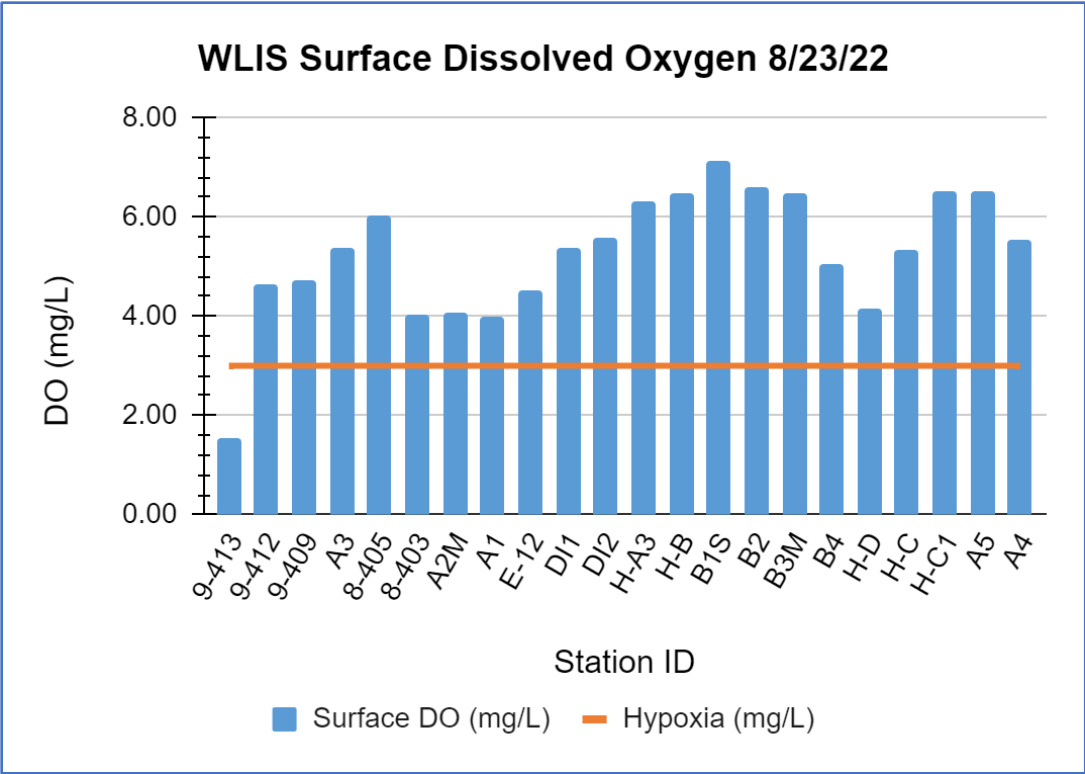
## SURVEY # 9 AT A GLANCE 08/23/2022

<b>Hypoxia (DO &lt; 3.00 mg/L)</b>	<p><b>1 station was hypoxic at surface depth:</b> Manhasset Bay – 9-413</p> <p><b>13 stations were hypoxic at bottom depth:</b> Manhasset Bay – 9-413, 9-412 Mid-LIS Waters – A3, B1S, B2, B3M, B4, H-C1, A5, A4 Westchester Shoreline – H-B Hempstead Harbor – H-D, H-C</p>
<b>Lowest surface DO concentration</b>	1.56 mg/L (Station 9-413 in Manhasset Bay)
<b>Lowest bottom DO concentration</b>	0.95 mg/L (Station 9-413 in Manhasset Bay)
<b>Average surface DO concentration</b>	5.27 mg/L
<b>Average bottom DO concentration</b>	2.98 mg/L
<b>Average surface water temperature</b>	23.90 °C
<b>Average bottom water temperature</b>	23.08 °C
<b>Average water column ΔT</b>	0.82 °C
<b>Average surface salinity</b>	27.42 ppt
<b>Average bottom salinity</b>	27.83 ppt
<b>Lowest surface pH</b>	6.84 (Station 9-413 in Manhasset Bay)
<b>Lowest bottom pH</b>	6.80 (Station 9-413 in Manhasset Bay)
<b>Average surface pH</b>	7.53
<b>Average bottom pH</b>	7.34

### Survey #9 Narrative Summary

This survey began at 06:20 and ended at 09:21, with the last low tide at 03:50 and 04:08 at New Rochelle, NY and Kings Point, NY, respectively. The weather was foggy and percent cloud cover varied greatly between stations, ranging from approximately 0 to 100% across all stations. The average air temperature was 77 °F, wind speed was 5 mph, and we experienced calm waters. The weather station at LaGuardia Airport reported 0.24" of precipitation for both the 24- and 48-hour period prior to the start of the survey. Secchi disk measurements were much lower in Manhasset Bay marina than usual (1.0 ft), but was much greater than usual in the Mid-LIS Waters (12.0 ft).

**More than half the stations sampled were hypoxic at bottom depth, and there were more than 4x the number of hypoxic stations compared to the previous week (Survey #8 on 8/16/22), from 4 to 13 stations.** This is likely due to the calm waters observed during this survey. **In addition, station 9-413 was the only hypoxic station at surface depth, and both bottom and surface pH at this station was slightly acidic (pH < 7).**



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

## SURVEY # 10 AT A GLANCE 08/30/2022

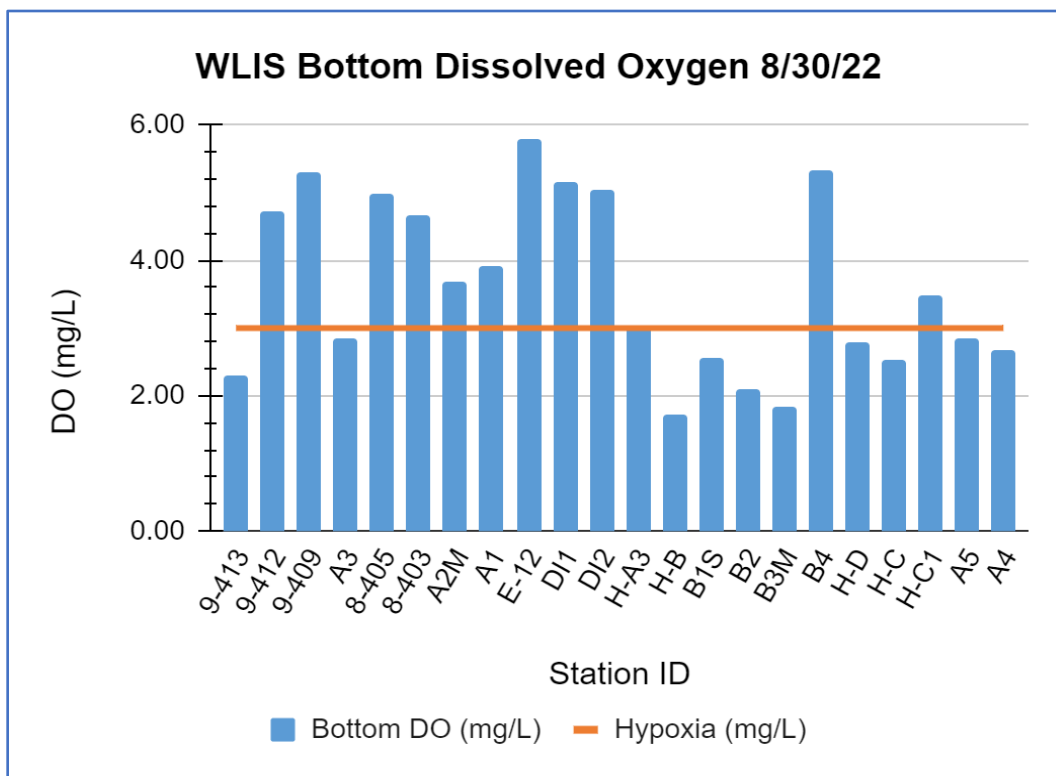
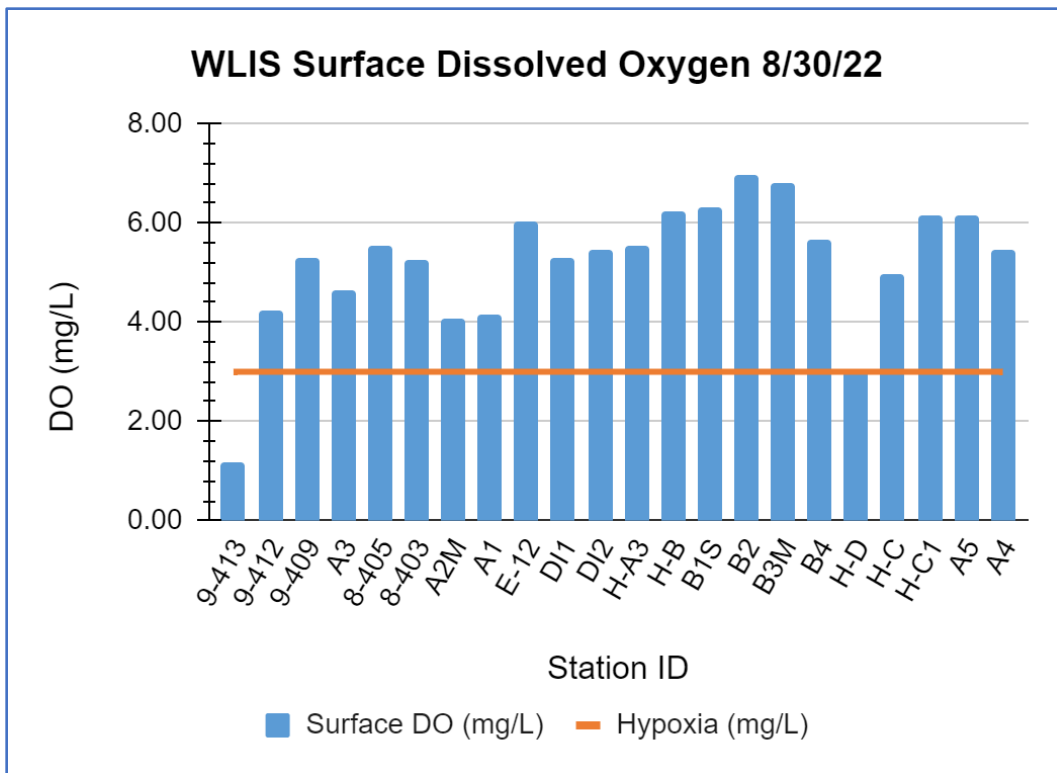
<b>Hypoxia (DO &lt; 3.00 mg/L)</b>	<b>1 station was hypoxic at surface depth:</b> Manhasset Bay – 9-413  <b>10 stations were hypoxic at bottom depth:</b> Manhasset Bay – 9-413 Mid-LIS Waters –A3, A4, A5, B1S, B2, B3M Westchester Shoreline – H-B Hempstead Harbor – H-D, H-C
<b>Lowest surface DO concentration</b>	1.19 mg/L (Station 9-413 in Manhasset Bay)
<b>Lowest bottom DO concentration</b>	1.72 mg/L (Station H-B at Westchester Shoreline)
<b>Average surface DO concentration</b>	5.20 mg/L
<b>Average bottom DO concentration</b>	3.60 mg/L
<b>Average surface water temperature</b>	24.55 °C
<b>Average bottom water temperature</b>	23.93 °C
<b>Average water column <math>\Delta T</math></b>	0.62 °C
<b>Average surface salinity</b>	27.63 ppt
<b>Average bottom salinity</b>	27.87 ppt
<b>Lowest surface pH</b>	7.04 (Station 9-413 in Manhasset Bay)
<b>Lowest bottom pH</b>	7.13 (Station 9-413 in Manhasset Bay)
<b>Average surface pH</b>	7.51
<b>Average bottom pH</b>	7.37

### Survey #10 Narrative Summary

The survey began at 06:21 and ended at 09:37, with the last high tide at 07:26 and 07:44 at New Rochelle, NY and Kings Point, NY, respectively. The weather was first overcast, then partly cloudy; average air temperature was 73 °F, and wind speeds were 8-10 mph. The percent cloud cover measured approximately 5 to 100% across all stations. The weather station at LaGuardia Airport reported no precipitation for both the 24- and 48-hour period prior to the start of the survey. Secchi disk measurements demonstrated relatively poor water clarity across stations, ranging from 2.5 ft in Manhasset and Little Neck Bays to only 5.5 ft in the Upper East River and Mid-LIS waters.

We observed many dead bunker fish (Menhaden) at the surface of Manhasset Bay stations and at the Manhasset Bay marina.

**The number of hypoxic stations at bottom depth decreased slightly from the previous week (Survey #9 on 8/23/22), from 13 to 10. Station 9-413 was the only one station that exhibited hypoxia at surface depth.**



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