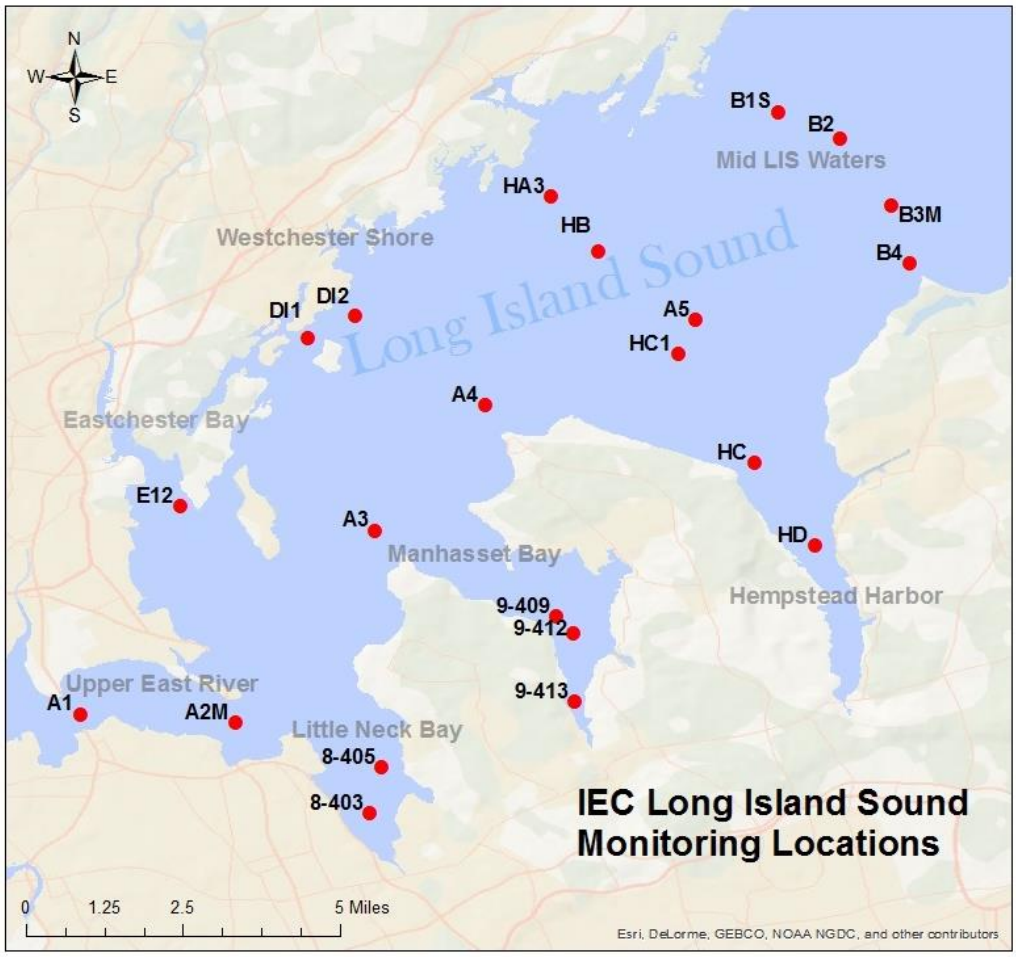
July 2018

Ambient Water Quality Monitoring in the Western Long Island Sound

SURVEY 4: 7/18/2018

INVESTIGATION NUMBER: 17803

Jessica Haley



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 its ongoing water pollution abatement program, NEIWPCC (IEC District) has started its 28th consecutive summer ambient monitoring survey in western Long Island Sound and the upper East River on Tuesday, June 26th.

During the summer 2018, IEC staff will perform 12 weekly surveys each summer of 22 stations in the far western Long Island Sound. The 12 surveys will include weekly *in situ* measurements of water temperature, salinity, dissolved oxygen, pH, and Secchi disk depth. Measurements at each station will be taken one meter below the surface, at mid-depth, and one meter above the bottom. 6 of the 12 surveys will include collection of additional samples for parameters relevant to hypoxia at 11 of the 22 stations (station in **bold**). 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.

The specific 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.

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Date	Survey Number	Parameters
6/26/18	Long Island Sound 1	*In situ*
7/3/18	Long Island Sound 2 and Nutrients	*In situ*, nutrients, chlorophyll a, BOD, TSS
7/10/18	Long Island Sound 3	*In situ*
7/17/18	Long Island Sound 4 and Nutrients	*In situ*, nutrients, chlorophyll a, BOD, TSS
7/24/18	Long Island Sound 5	*In situ*
7/31/18	Long Island Sound 6 and Nutrients	*In situ*, nutrients, chlorophyll a, BOD, TSS
8/7/18	Long Island Sound 7	*In situ*
8/14/18	Long Island Sound 8 and Nutrients	*In situ*, nutrients, chlorophyll a, BOD, TSS
8/21/18	Long Island Sound 9	*In situ*
8/28/18	Long Island Sound 10 and Nutrients	*In situ*, nutrients, chlorophyll a, BOD, TSS
9/4/18	Long Island Sound 11	*In situ*
9/11/18	Long Island Sound 12 and Nutrients	*In situ*, nutrients, chlorophyll a, BOD, TSS

This summer, 12 surveys are scheduled between late June and mid-September and include sample collection for nutrients, chlorophyll *a*, biochemical oxygen demand (BOD), and total suspended solids (TSS) analysis.

Samples for chlorophyll *a* and TSS will be collected at each station during 6 of the 12 surveys (every other week starting 7/3/2018). Samples for nutrient and BOD analysis will be collected at 11 of the 22 stations during 6 of the 12 surveys (every other week starting 7/3/2018), which includes both embayment and open water locations.

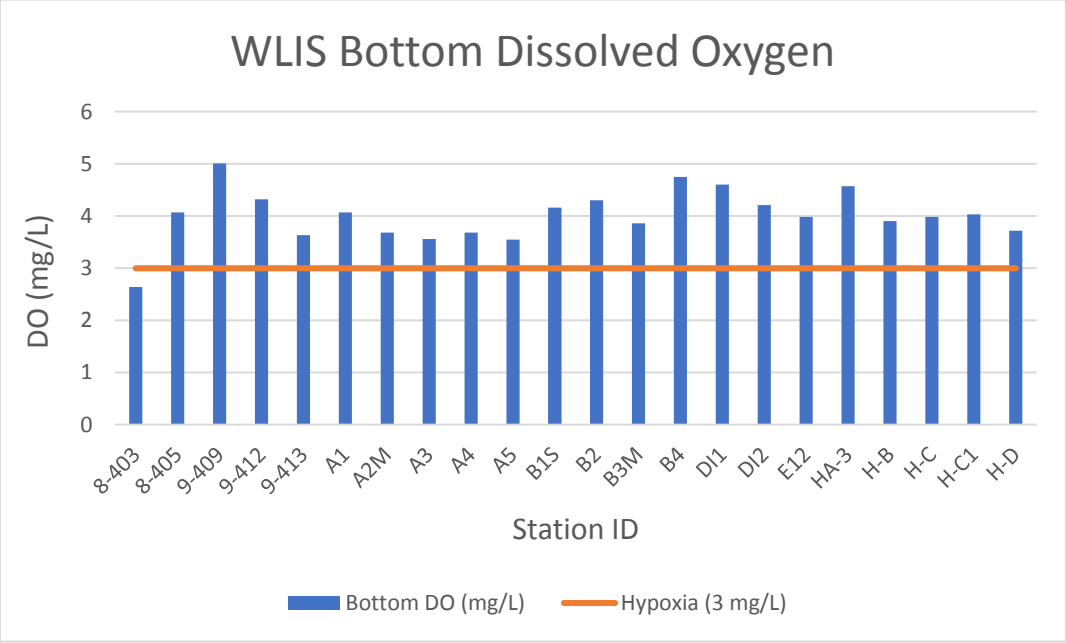
SURVEY # 4 AT A GLANCE

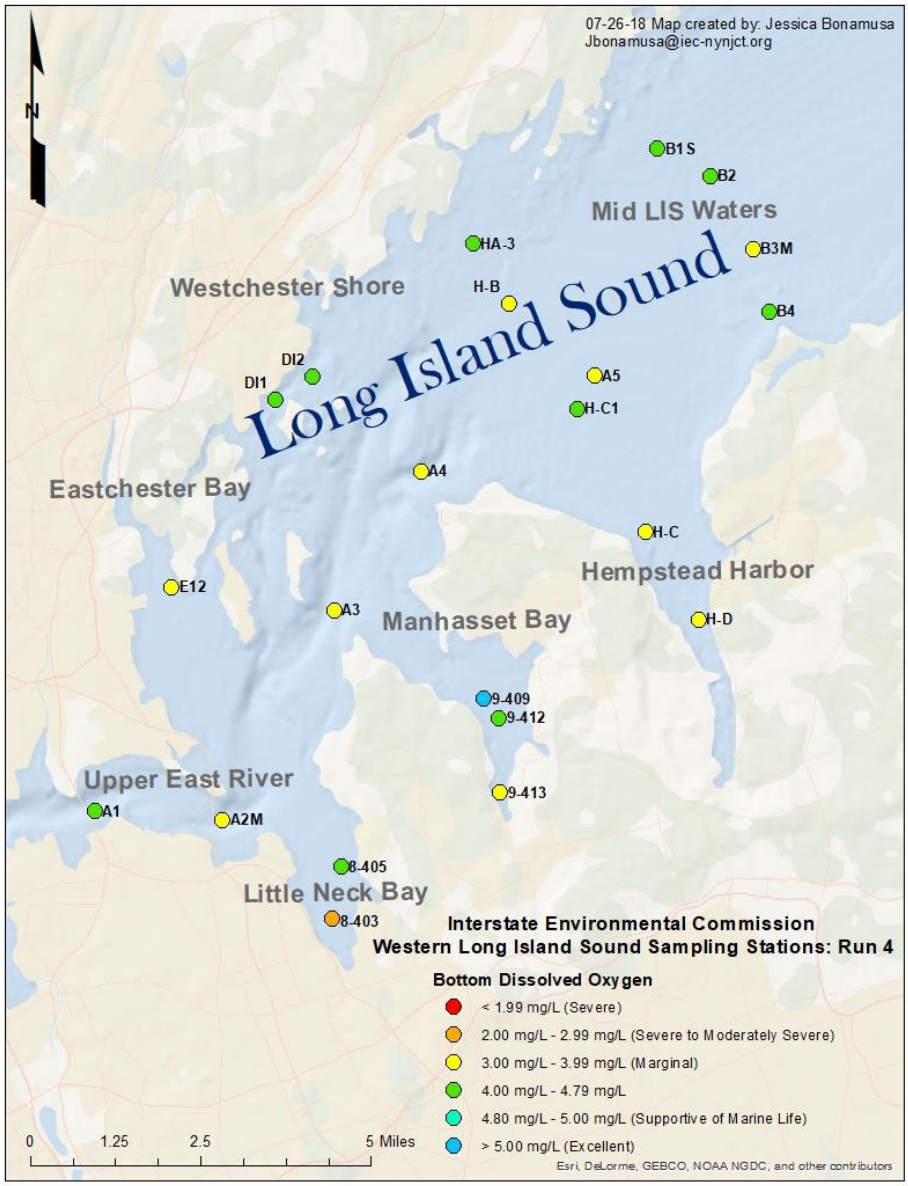
Hypoxia (DO <3.00 mg/L)	One site exhibited hypoxia: 2.64mg/L at site 8-403
Lowest Surface DO concentration	3.83 mg/L
Lowest bottom DO concentration	2.64 mg/L
Average surface DO concentration	6.12 mg/L
Average bottom DO concentration	3.72 mg/L

Average surface water temperature	20.99 °C
Average bottom water temperature	19.29 °C
Average water column ΔT	1.70 °C
Average surface salinity	26.57 ppt
Average bottom salinity	27.21 ppt

Atmospheric temperatures during the time of the survey ranged between 19.4 and 30°C. The weather conditions were partly cloudy. The survey started at 06:12 and ended at 10:21, with low tide at 10:51 and high tide at 04:07 as per NOAA Tide at New Rochelle.

Marine organisms need oxygen to live, and low concentrations can have serious consequences for a marine ecosystem. Hypoxia occurs when dissolved oxygen ("DO") concentrations become low. The Long Island Sound Study defines hypoxia as DO values which are below a concentration of 3.00 mg/L (EPA, 2000).




07-26-18 Map created by: Jessica Bonamusa
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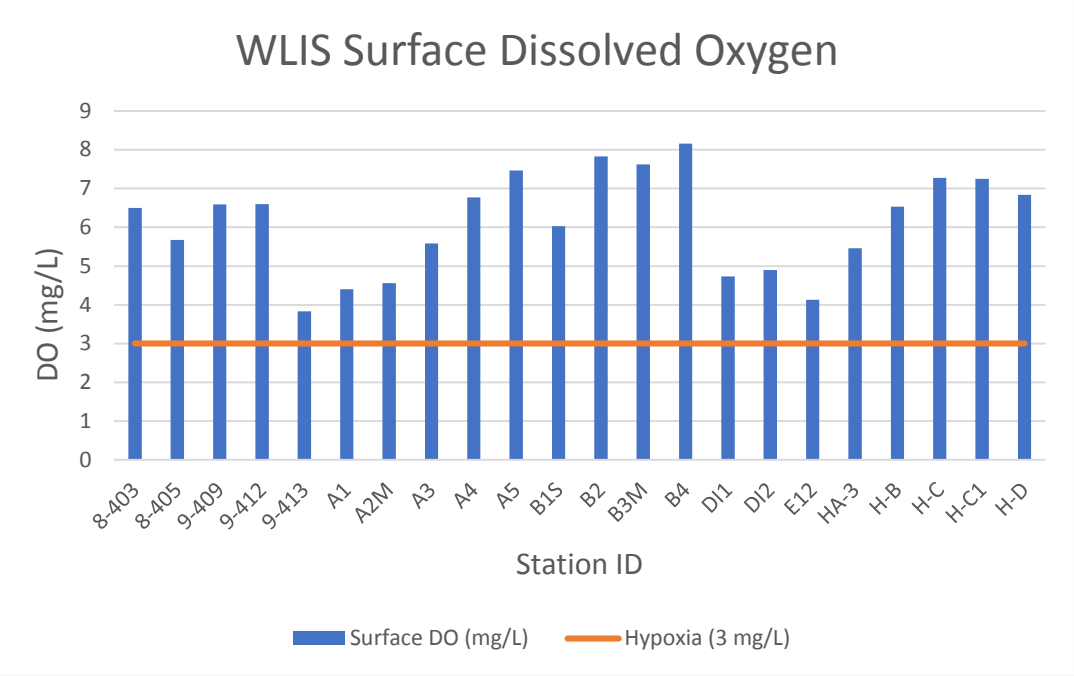
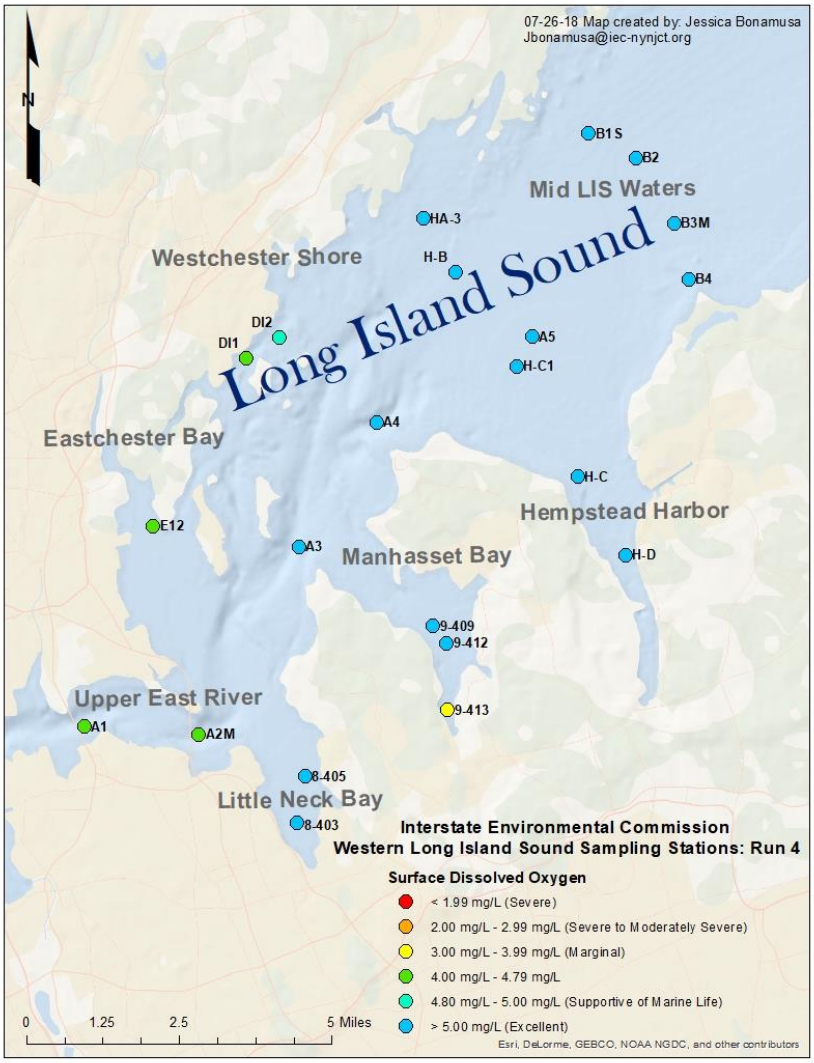
N
B1S
B2
Mid LIS Waters
HA-3
B3M
Westchester Shore
H-B
B4
Long Island Sound
DI2
DI1
A5
H-C1
A4
Eastchester Bay
H-C
Hempstead Harbor
E12
A3
Manhasset Bay
H-D
9-409
9-412
Upper East River
9-413
A1
A2M
8-405
Little Neck Bay
8-403
Interstate Environmental Commission
Western Long Island Sound Sampling Stations: Run 4
Bottom Dissolved Oxygen
< 1.99 mg/L (Severe)
2.00 mg/L - 2.99 mg/L (Severe to Moderately Severe)
3.00 mg/L - 3.99 mg/L (Marginal)
4.00 mg/L - 4.79 mg/L
4.80 mg/L - 5.00 mg/L (Supportive of Marine Life)
> 5.00 mg/L (Excellent)
0
1.25
2.5
5 Miles
Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors


WLIS Surface Dissolved Oxygen
DO (mg/L)
9
8
7
6
5
4
3
2
1
0
8-403
8-405
9-409
9-412
9-413
A1
A2M
A3
A4
A5
B1S
B2
B3M
B4
DI1
DI2
E12
HA-3
H-B
H-C
H-C1
H-D
Station ID
Surface DO (mg/L)
Hypoxia (3 mg/L)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N
B1S
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DI2
DI1
Long Island Sound
A5
H-C1
A4
Eastchester Bay
H-C
Hempstead Harbor
E12
A3
Manhasset Bay
H-D
9-409
9-412
Upper East River
9-413
A1
A2M
8-405
Little Neck Bay
8-403
Interstate Environmental Commission
Western Long Island Sound Sampling Stations: Run 4
Surface Dissolved Oxygen
< 1.99 mg/L (Severe)
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4.80 mg/L - 5.00 mg/L (Supportive of Marine Life)
> 5.00 mg/L (Excellent)
0
1.25
2.5
5 Miles
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TSS and BOD

BOD and TSS values should be considered preliminary as they are pending final data review.

Station ID	TSS (mg/L)
9-413	17.6
9-412	14.5
9-409	37.9
A3	9.94
8-405	11.5
8-403	10.5
A2M	10.6
A1	14.0
E-12	10.0
DI-1	9.44
DI-2	14.8
H-A3	9.86
H-B	7.92
B1S	9.66
B2	7.52
B3M	7.88
B4	9.94
H-D	11.7
H-C	10.1
H-C1	9.36
A5	8.78
A4	11.8
A2M dup	9.74

Station ID	BOD (mg/L)
9-412	3.15
8-403	<3.0
A2M	<3.0
E-12	<3.0
DI-2	<3.0
H-A3	<3.0
B1S	<3.0
B3M	<3.0

H-D	<3.0
A5	<3.0
A4	<3.0
A2M dup	<3.0

SECCHI DISK DEPTH

Secchi disk measurements ranged from 2.5 feet to 7.0 feet. The highest readings were taken at stations H-B, H-C1 and A4. The lowest reading was taken at station 9-413 in Manhasset Bay.

CITATIONS

US EPA. 2000. Ambient aquatic life water quality criteria for dissolved oxygen (saltwater): Cape Cod to Cape Hatteras. EPA-822-R-00-012. Office of Water, Washington, DC. p. 49.