

June 2018

Ambient Water Quality Monitoring in the Western Long Island Sound

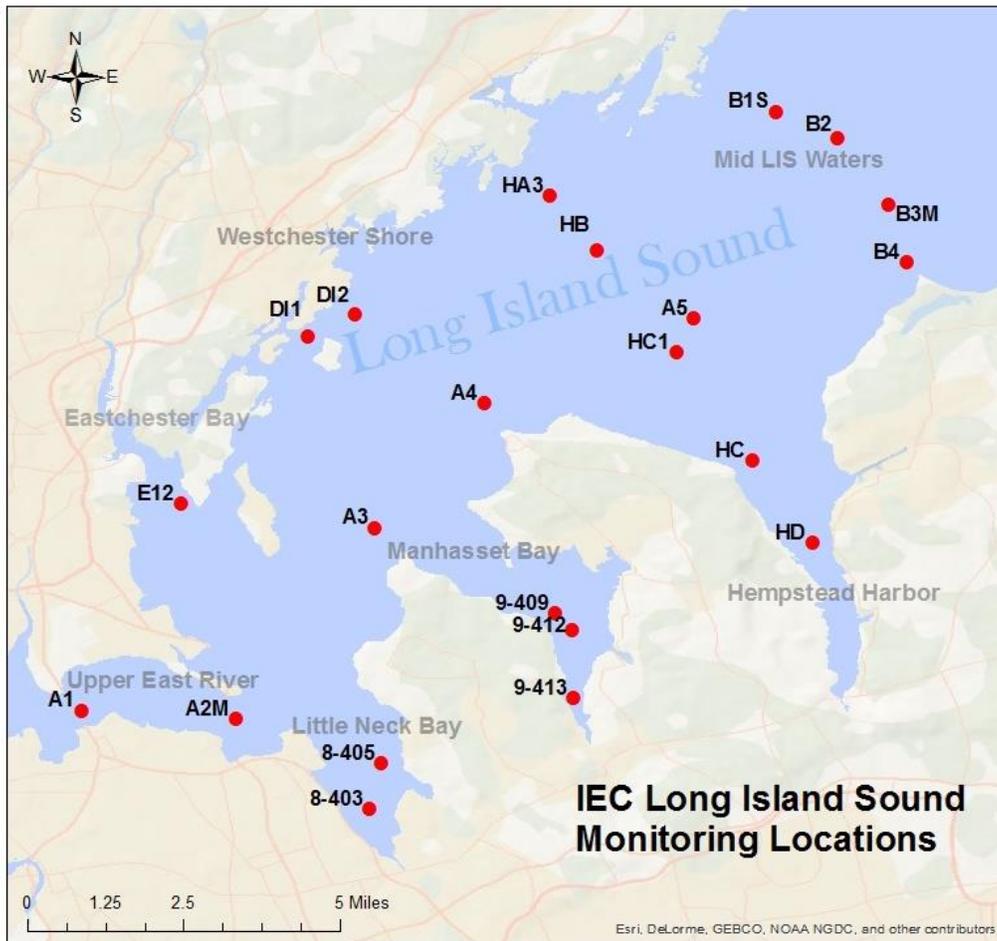
SURVEY 1: 6/26/2018

INVESTIGATION NUMBER: 17787

Jessica Halev



**Interstate
Environmental
Commission**
NY · NJ · CT



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
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A4	40.8725	-73.7343
A5	40.8923	-73.6853
B1S	40.9403	-73.6667
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B4	40.9054	-73.6360
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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

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Date	Survey Number	Parameters
6/26/18	Long Island Sound 1	<i>In situ</i>
7/3/18	Long Island Sound 2 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
7/10/18	Long Island Sound 3	<i>In situ</i>
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7/24/18	Long Island Sound 5	<i>In situ</i>
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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.

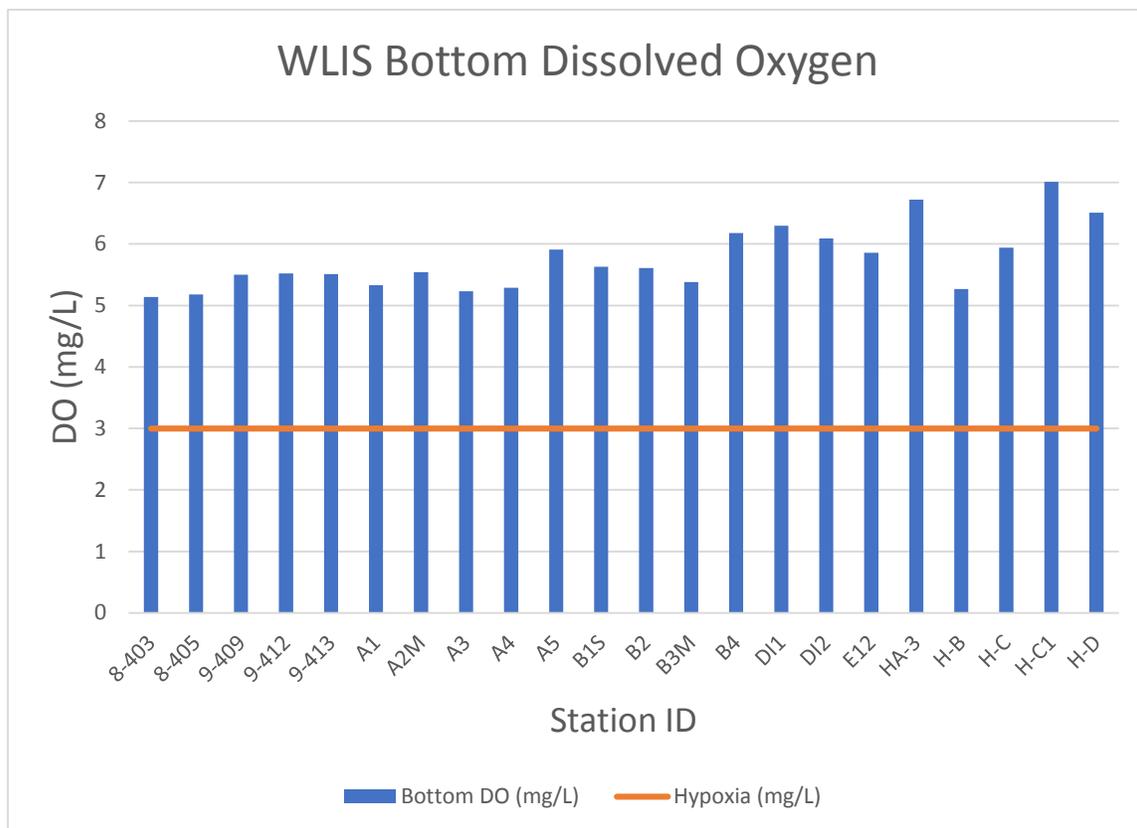
SURVEY # 1 AT A GLANCE

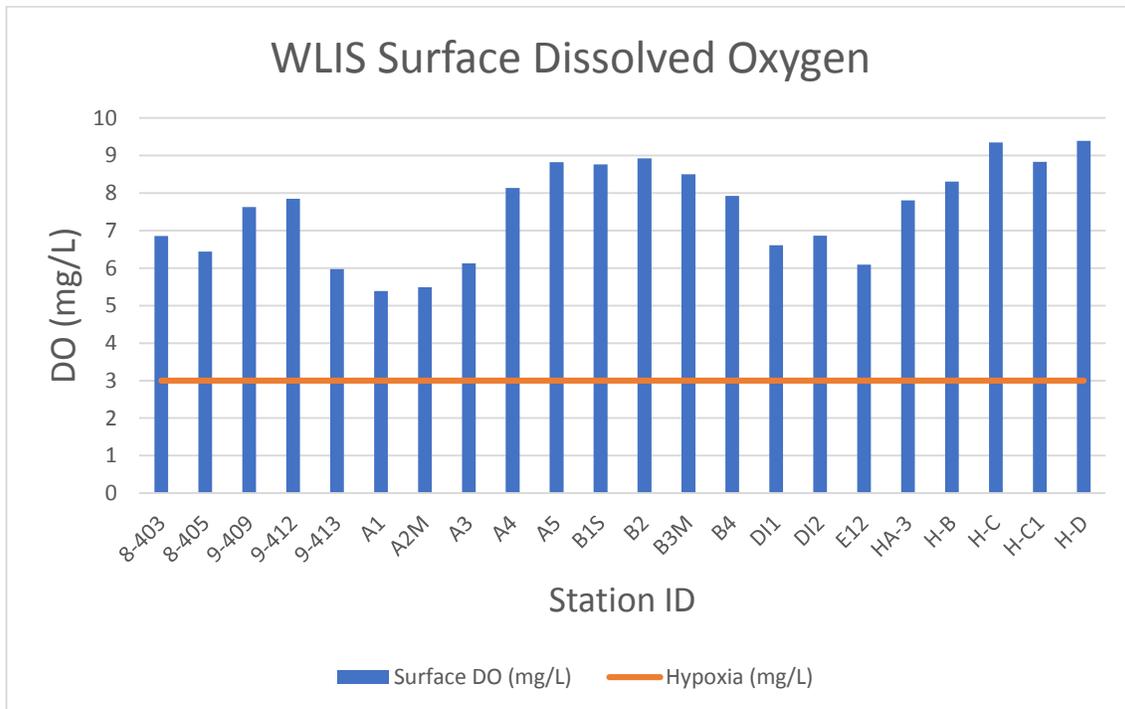
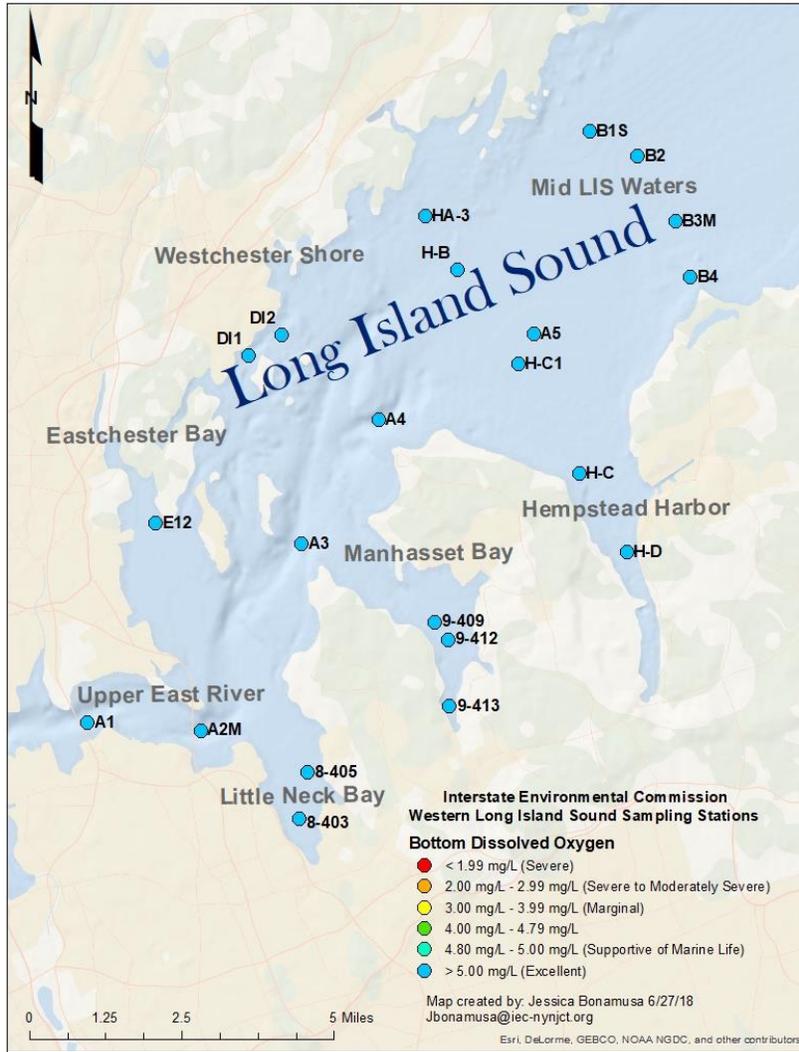
Hypoxia (DO <3.00 mg/L)	No sites exhibited hypoxia.
Lowest Surface DO concentration	5.39 mg/L
Lowest bottom DO concentration	5.14 mg/L
Average surface DO concentration	7.55 mg/L
Average bottom DO concentration	5.75 mg/L

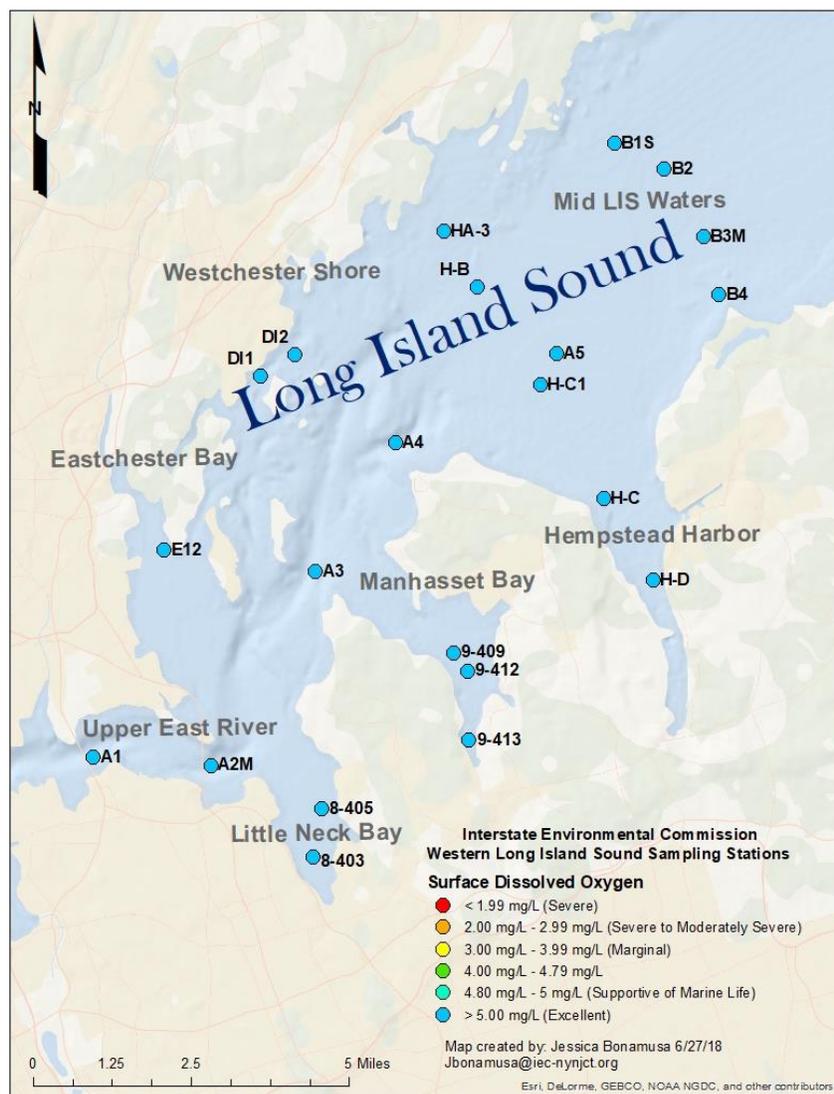
Average surface water temperature	19.80 °C
Average bottom water temperature	18.51 °C
Average water column ΔT	1.28 °C
Average surface salinity	25.68 ppt
Average bottom salinity	25.86 ppt

Atmospheric temperatures during the time of the survey ranged between 17.78 and 25°C. The weather conditions were sunny. The survey started at 06:19 and ended at 11:37, with low tide at 05:24 and high tide at 11:17 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).







SECCHI DISK DEPTH

Secchi disk measurements ranged from 3.0 feet to 7.5 feet. The highest reading was taken at stations B1S and B3M, both mid-LIS waters. The lowest readings were taken at stations 9-412, 9-409 in Manhasset Bay and 8-403 in Little Neck Bay.

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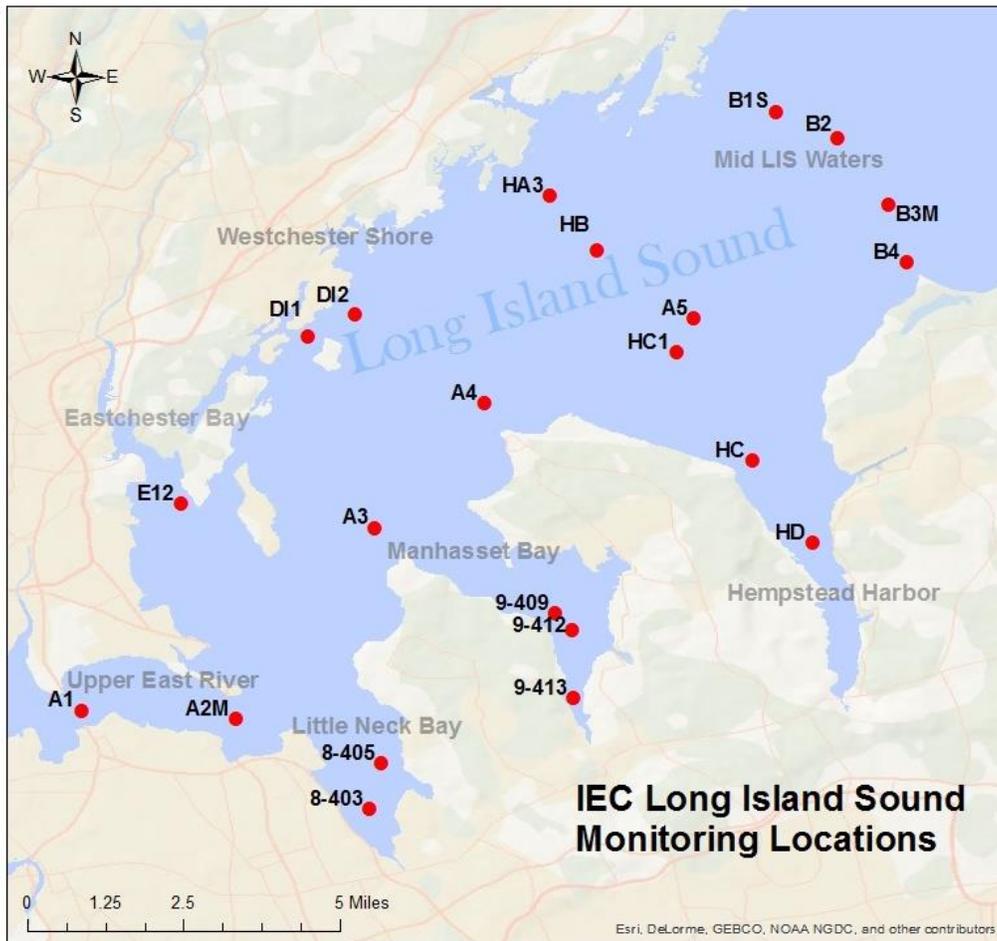
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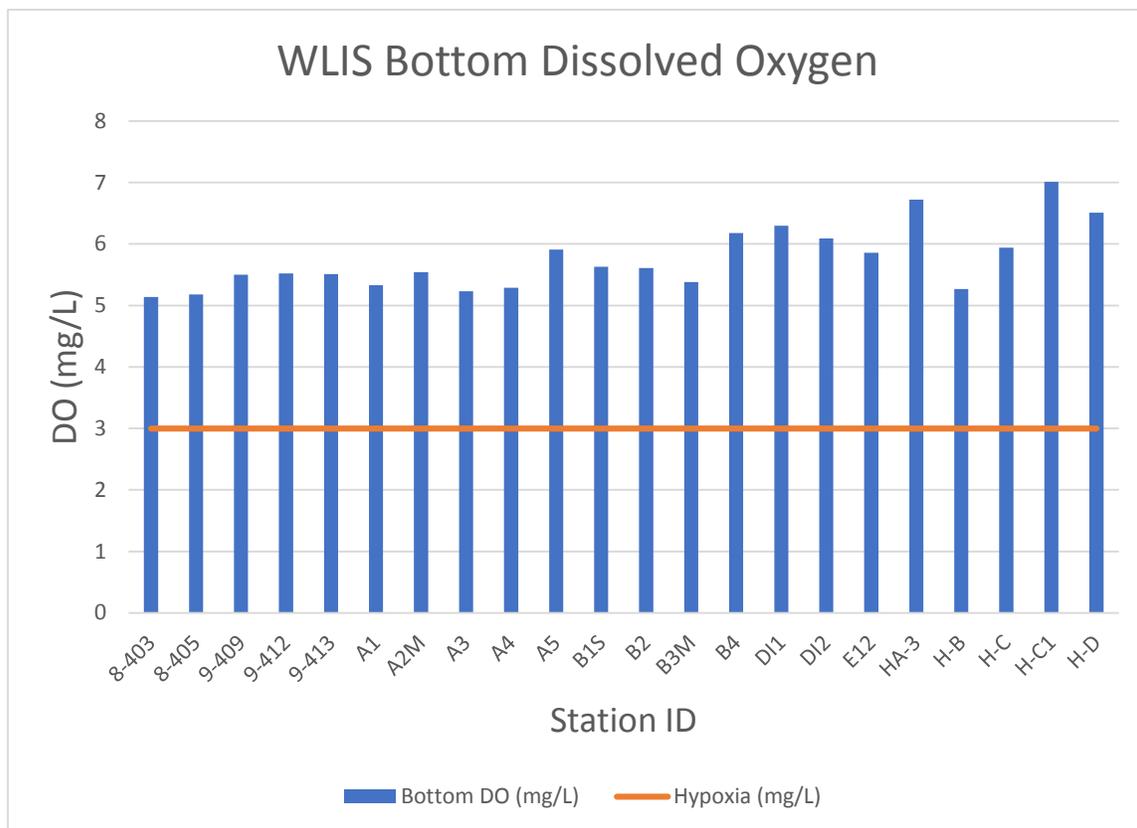
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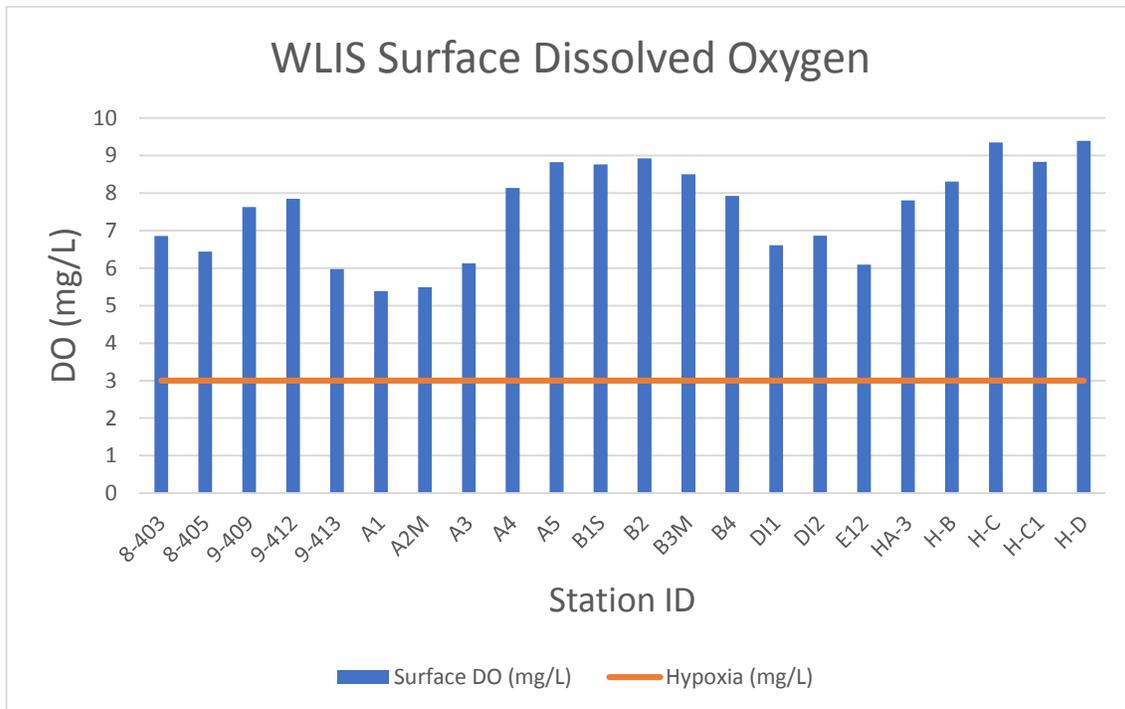
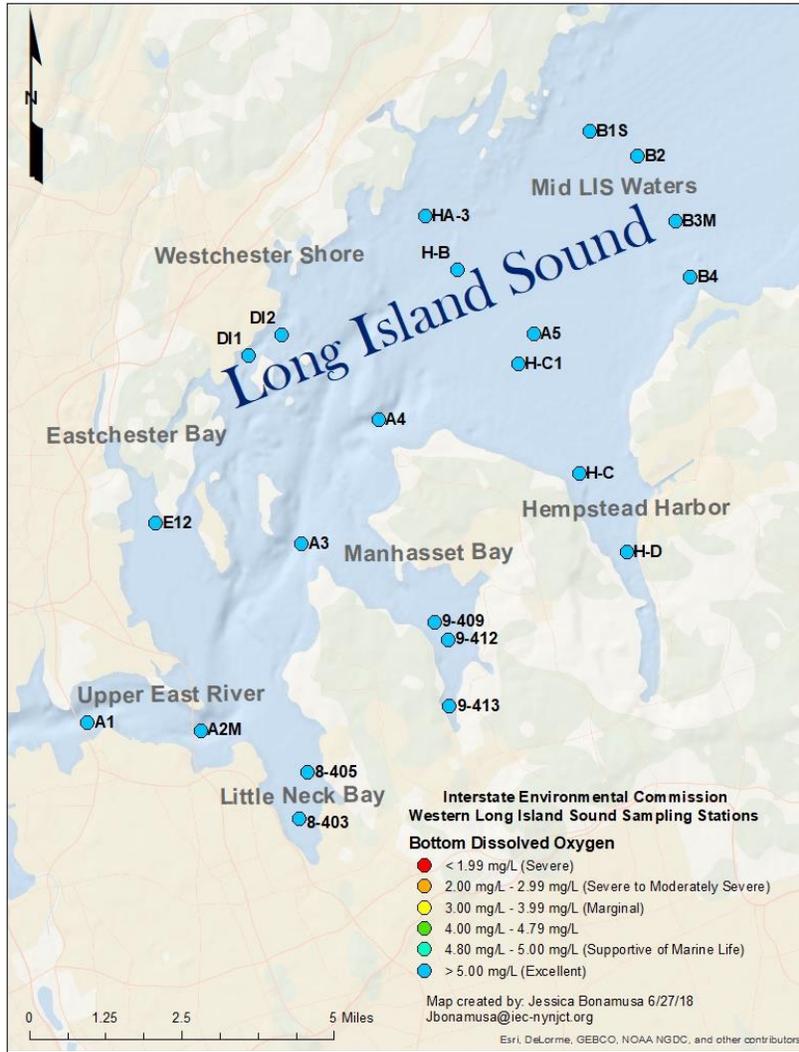
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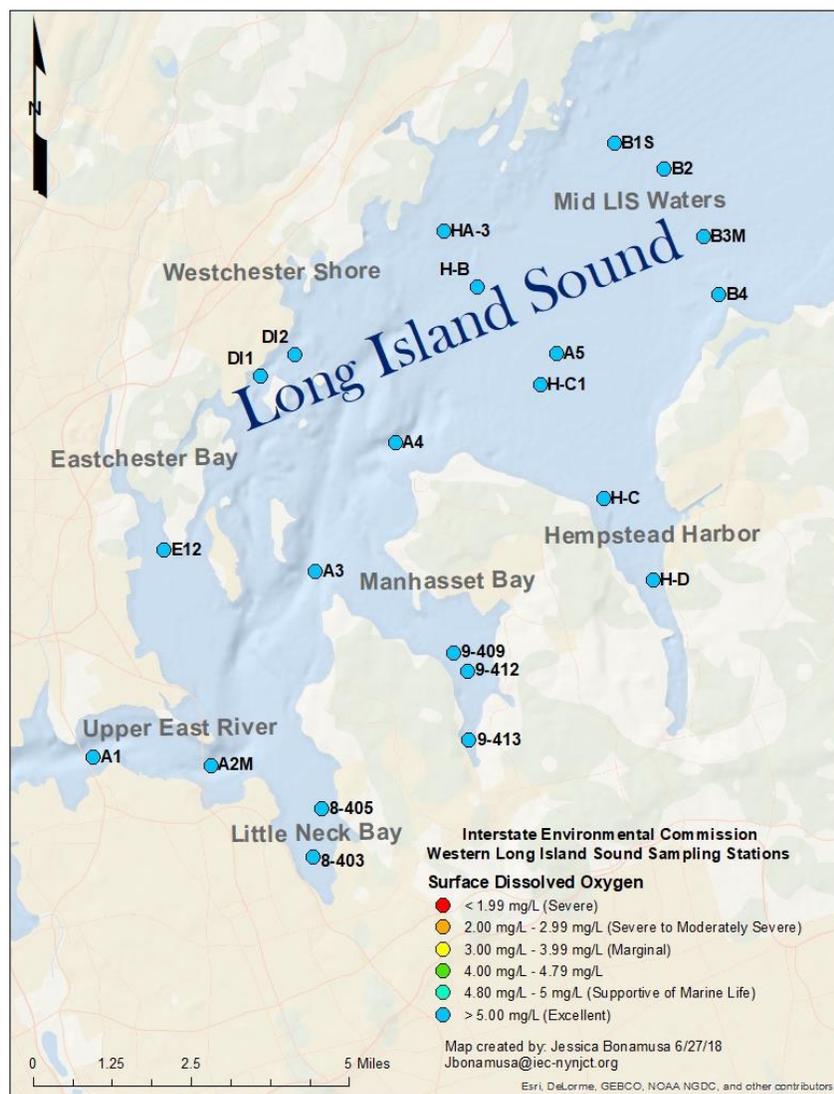
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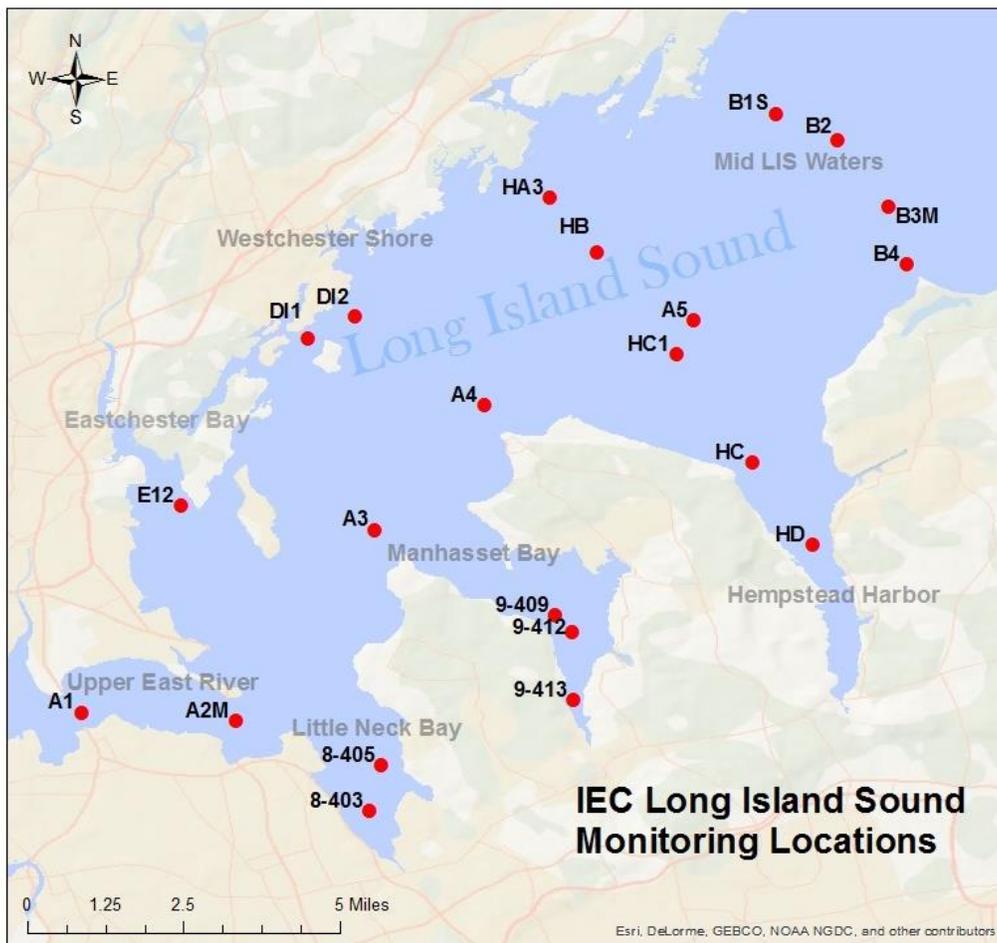
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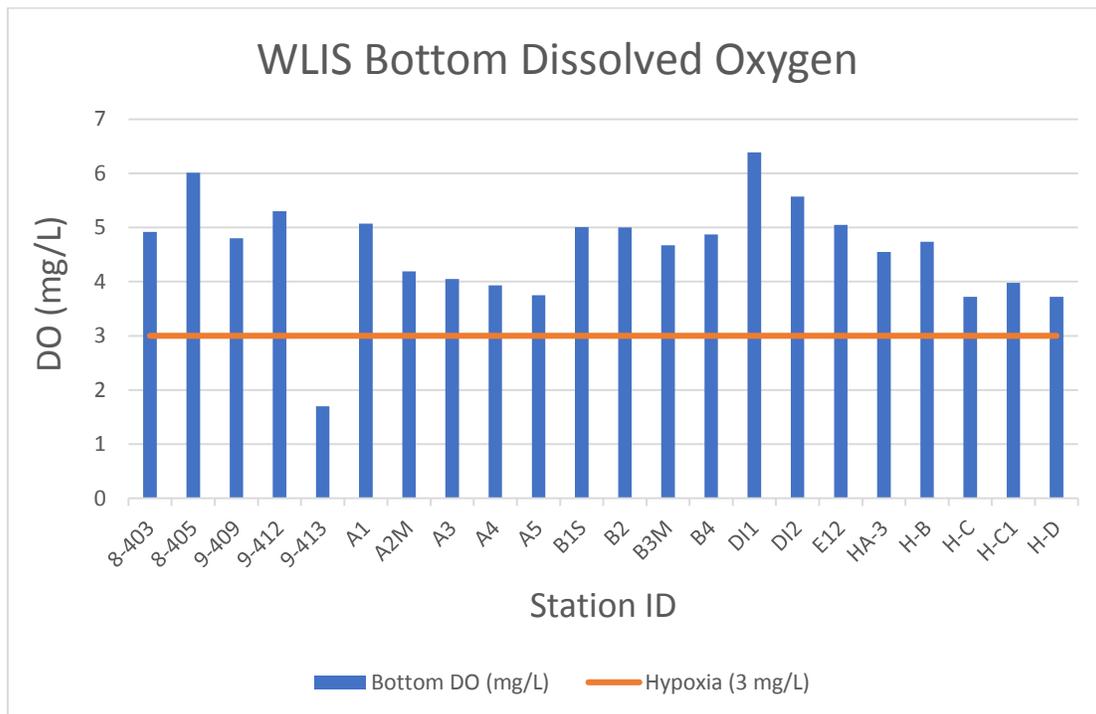
SURVEY # 2 AT A GLANCE

Hypoxia (DO <3.00 mg/L)	1 site exhibited hypoxia: 9-413 for surface and bottom depth readings
Lowest Surface DO concentration	2.24 mg/L (9-413)
Lowest bottom DO concentration	1.70 mg/L (9-413)
Average surface DO concentration	8.56 mg/L
Average bottom DO concentration	4.59 mg/L

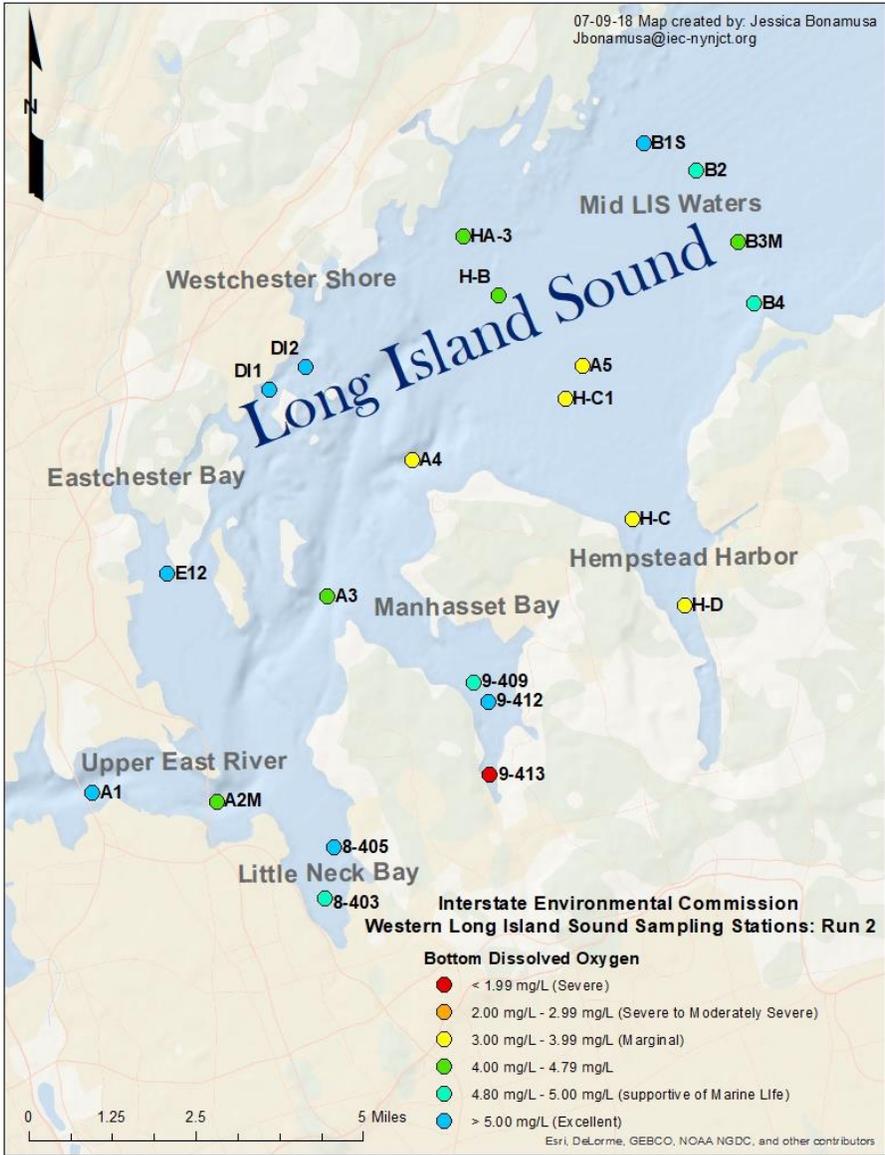
Average surface water temperature	22.39 °C
Average bottom water temperature	18.21 °C
Average water column ΔT	4.18 °C
Average surface salinity	25.45 ppt
Average bottom salinity	25.51 ppt

Atmospheric temperatures during the time of the survey ranged between 26.1 and 32.8°C. The weather conditions were mostly cloudy. The survey started at 06:59 and ended at 11:21, with low tide at 08:32 and high tide at 14:30 as per NOAA Tide at New Rochelle.

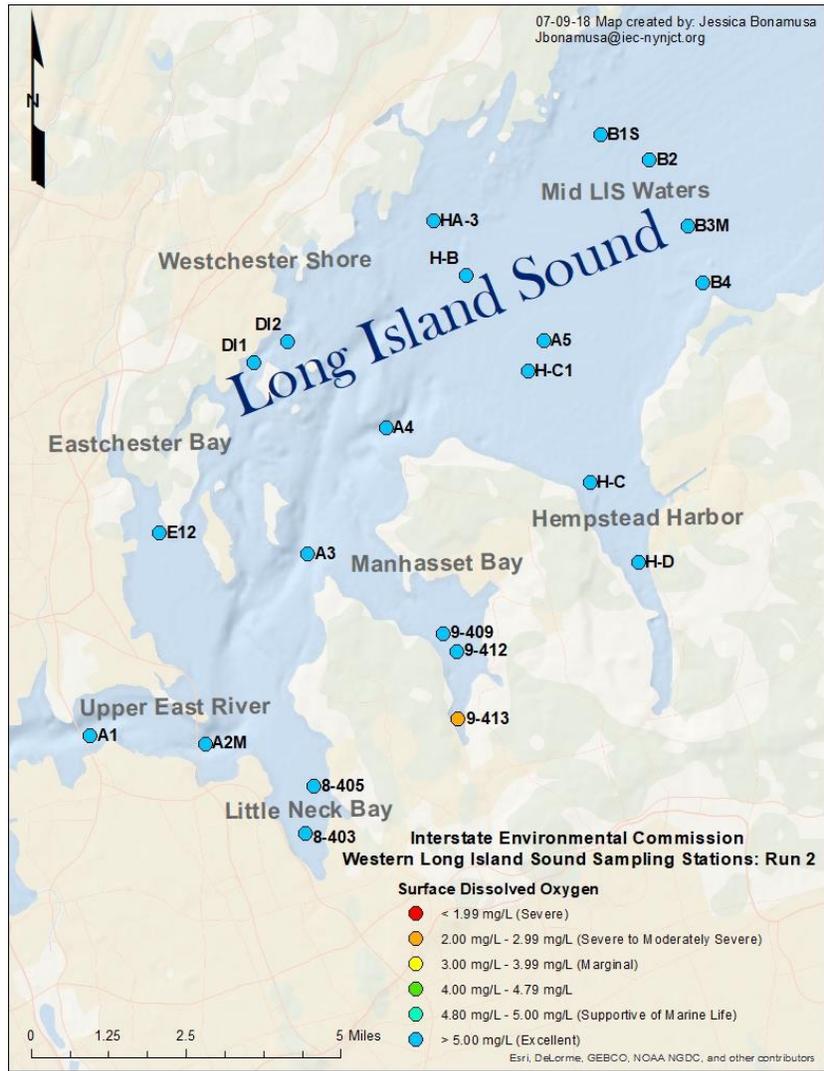
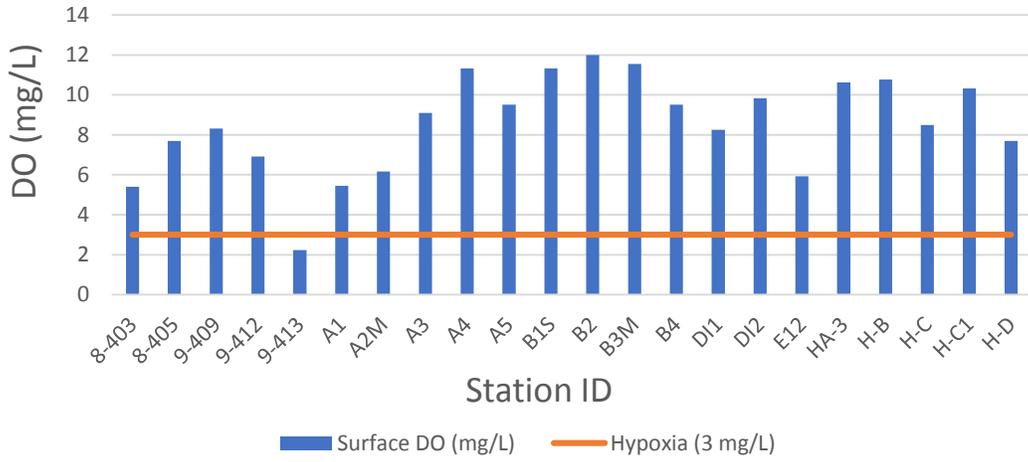
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07-09-18 Map created by: Jessica Bonamusa
Jbonamusa@iec-nynjct.org



WLIS Surface Dissolved Oxygen



BOD and TSS

Samples were collected for nutrients this survey. BOD and TSS results are ready, for the rest of the nutrient data is still being analyzed and will be sent out at a later date.

Station ID	BOD (mg/L)
9-412	2.83
8-403	3.07
A2M	3.01
E-12	2.67
DI-2	2.77
H-A3	2.22
B1S	2.43
B3M	2.54
H-D	2.47
A5	2.30
A4	3.32
H-A3 DUP	1.96

Station ID	TSS (mg/L)
9-413	5.3
9-412	12.1
9-409	12.2
A3	8.8
8-405	11.4
8-403	4.2
A2M	11.8
A1	3.8
E-12	13.5
DI-1	11.0
DI-2	7.3
H-A3	7.4
H-B	7.1
B1S	6.7
B2	62.1
B3M	10.0
B4	12.7
H-D	8.9
HC	7.5
H-C1	15.6
A5	21.6
A4	15.2

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Secchi disk measurements ranged from 2.5 feet to 6.0 feet. The highest readings were taken at stations B4 (mid-LIS waters) and HC-1 (Hempstead Harbor). The lowest reading was taken at station 8-403 in Little Neck Bay.

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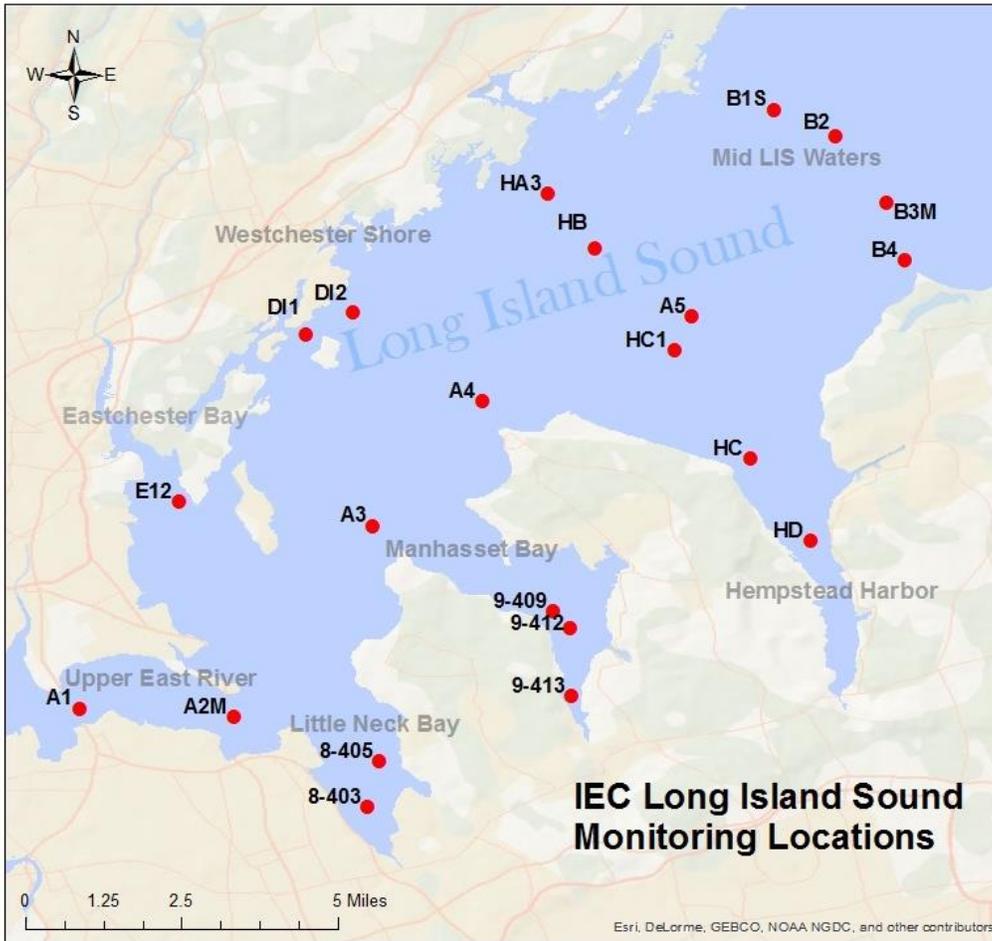
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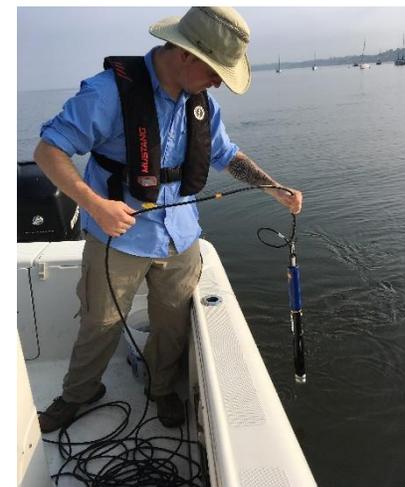
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9/11/18	Long Island Sound 12 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS



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.

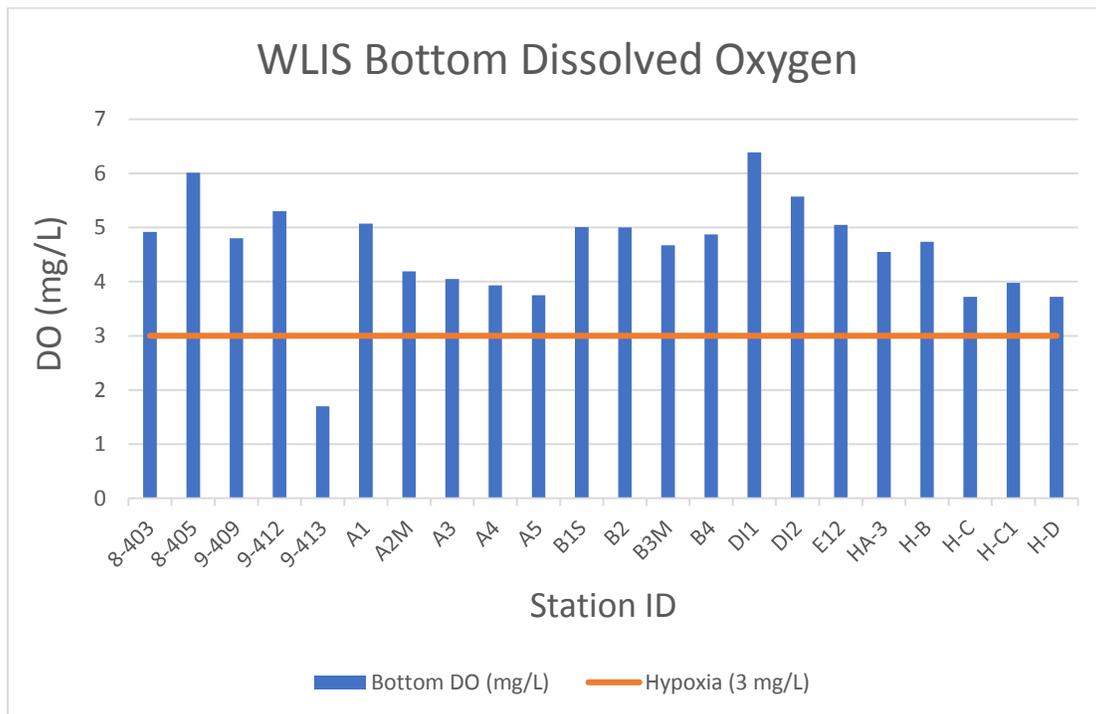
SURVEY # 2 AT A GLANCE

Hypoxia (DO <3.00 mg/L)	1 site exhibited hypoxia: 9-413 for surface and bottom depth readings
Lowest Surface DO concentration	2.24 mg/L (9-413)
Lowest bottom DO concentration	1.70 mg/L (9-413)
Average surface DO concentration	8.56 mg/L
Average bottom DO concentration	4.59 mg/L

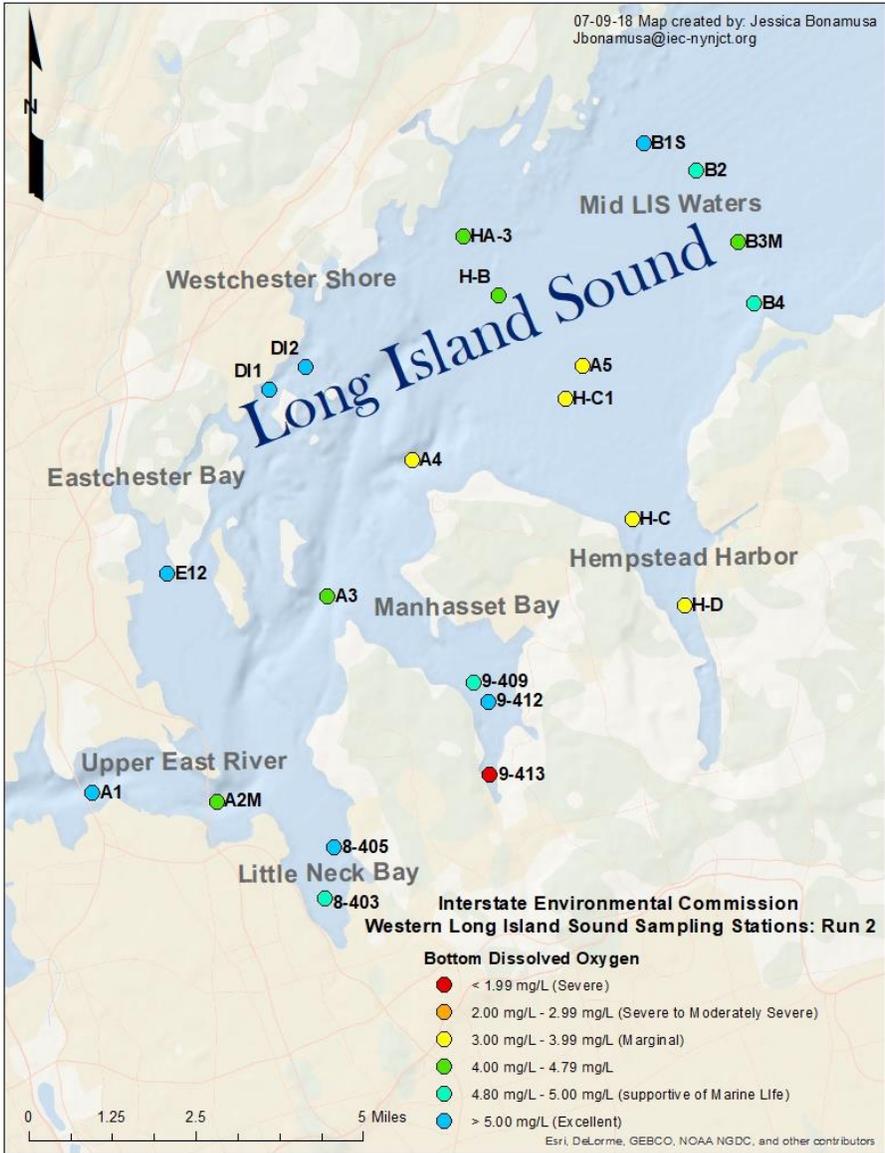
Average surface water temperature	22.39 °C
Average bottom water temperature	18.21 °C
Average water column ΔT	4.18 °C
Average surface salinity	25.45 ppt
Average bottom salinity	25.51 ppt

Atmospheric temperatures during the time of the survey ranged between 26.1 and 32.8°C. The weather conditions were mostly cloudy. The survey started at 06:59 and ended at 11:21, with low tide at 08:32 and high tide at 14:30 as per NOAA Tide at New Rochelle.

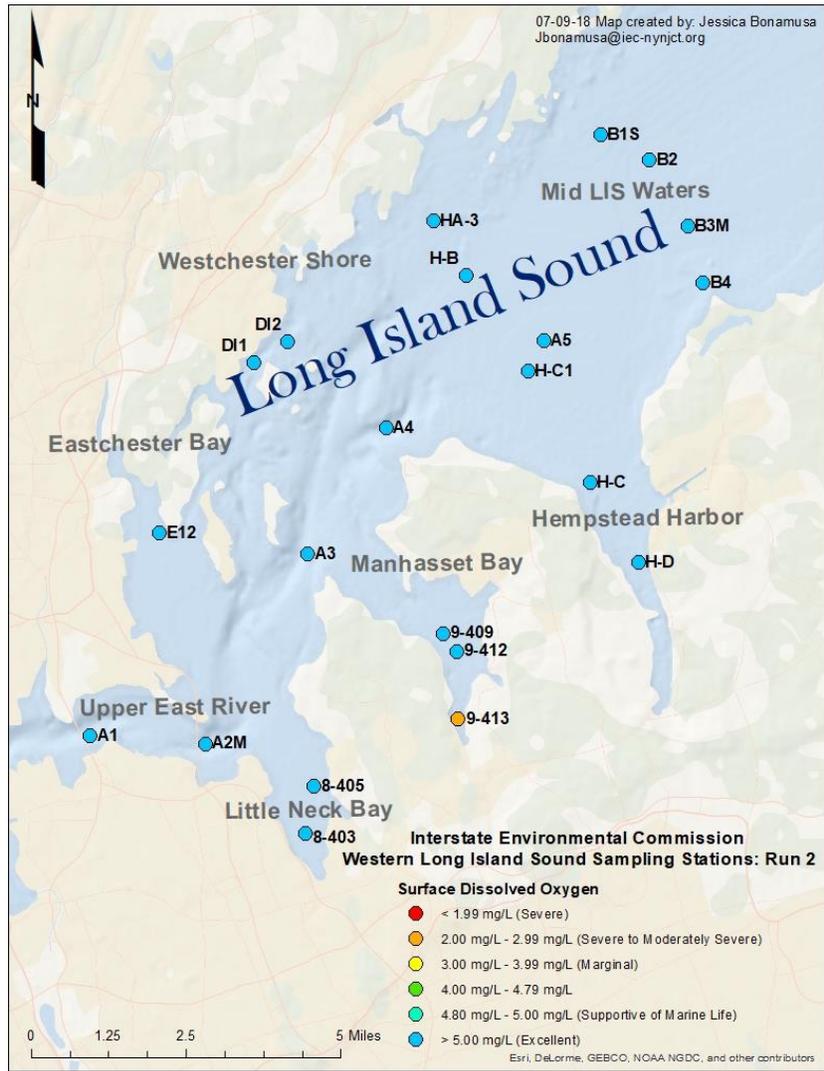
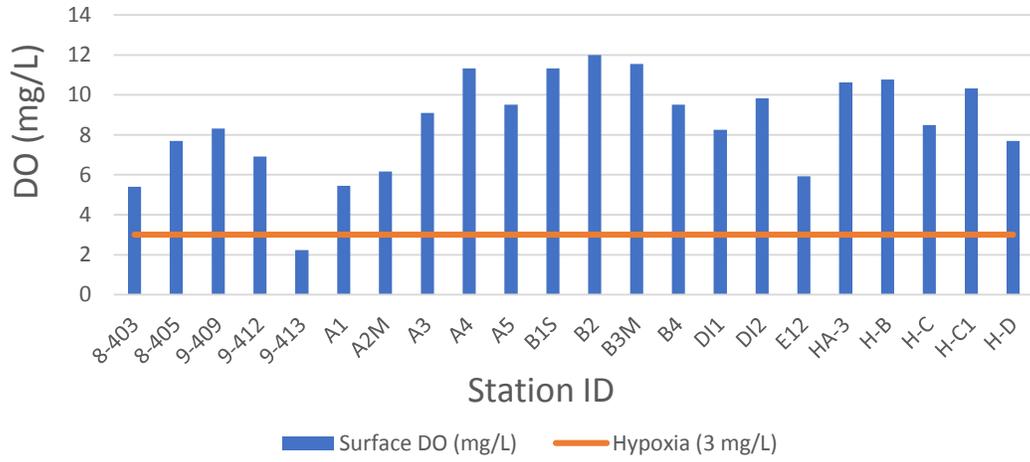
Marine organisms need oxygen to live, and low concentrations can have serious consequences for a marine ecosystem. Hypoxia occurs when dissolved oxygen (“DO”) concentrations become low. The Long Island Sound Study defines hypoxia as DO values which are below a concentration of 3.00 mg/L (EPA, 2000).



07-09-18 Map created by: Jessica Bonamusa
Jbonamusa@iec-nynjct.org



WLIS Surface Dissolved Oxygen



BOD and TSS

Samples were collected for nutrients this survey. BOD and TSS results are ready, for the rest of the nutrient data is still being analyzed and will be sent out at a later date.

Station ID	BOD (mg/L)
9-412	2.83
8-403	3.07
A2M	3.01
E-12	2.67
DI-2	2.77
H-A3	2.22
B1S	2.43
B3M	2.54
H-D	2.47
A5	2.30
A4	3.32
H-A3 DUP	1.96

Station ID	TSS (mg/L)
9-413	5.3
9-412	12.1
9-409	12.2
A3	8.8
8-405	11.4
8-403	4.2
A2M	11.8
A1	3.8
E-12	13.5
DI-1	11.0
DI-2	7.3
H-A3	7.4
H-B	7.1
B1S	6.7
B2	62.1
B3M	10.0
B4	12.7
H-D	8.9
HC	7.5
H-C1	15.6
A5	21.6
A4	15.2

SECCHI DISK DEPTH

Secchi disk measurements ranged from 2.5 feet to 6.0 feet. The highest readings were taken at stations B4 (mid-LIS waters) and HC-1 (Hempstead Harbor). The lowest reading was taken at station 8-403 in Little Neck 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.

July 2018

Ambient Water Quality Monitoring in the Western Long Island Sound

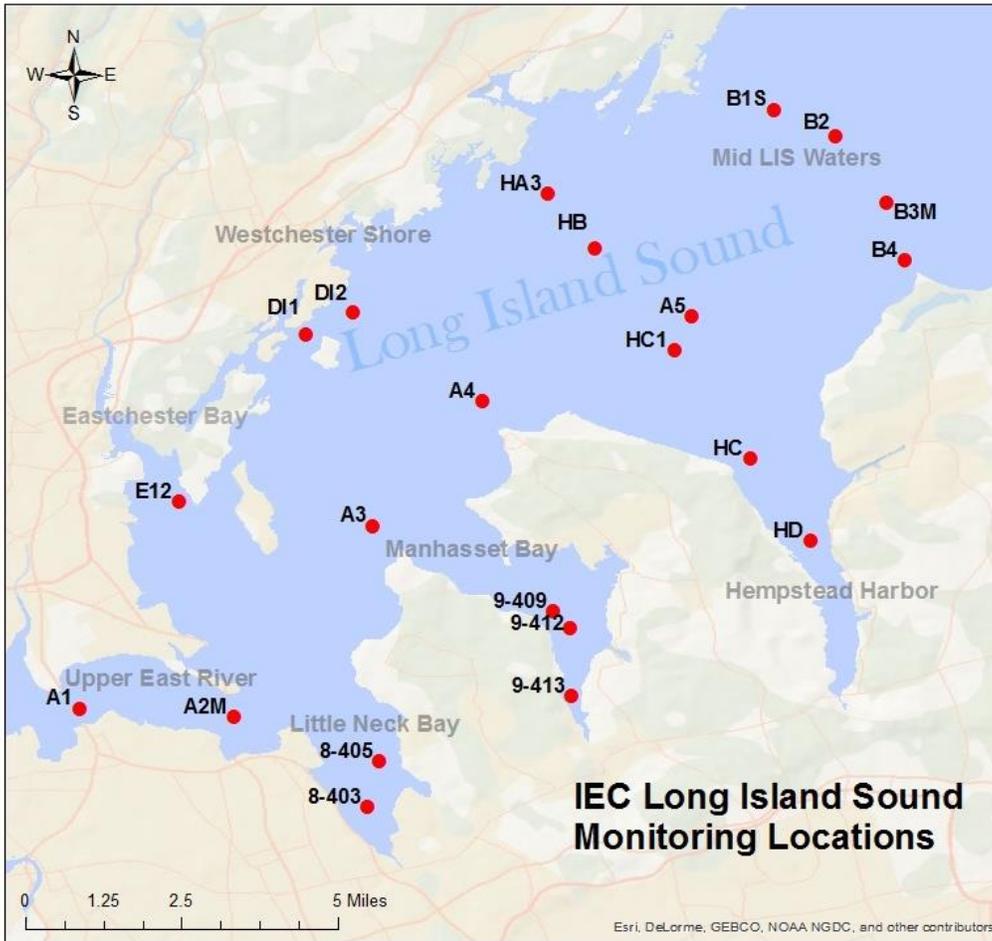
SURVEY 3: 7/10/2018

INVESTIGATION NUMBER: 17797

Jessica Halev



**Interstate
Environmental
Commission**
NY · NJ · CT



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
D11	40.8883	-73.7748
D12	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.

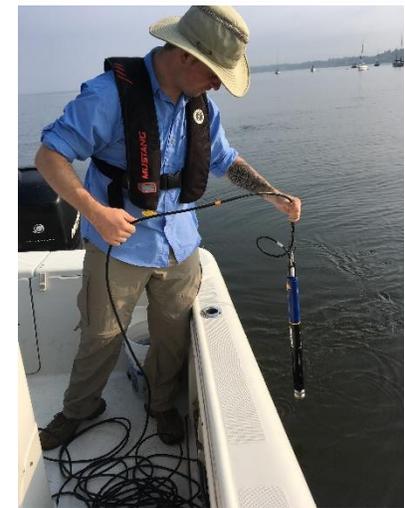
During the summer 2018, IEC staff will perform 12 weekly surveys each summer of 22 stations in the far western Long Island Sound. The 12 surveys will include weekly *in situ* measurements of water temperature, salinity, dissolved oxygen, pH, and Secchi disk depth. Measurements at each station will be 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	<i>In situ</i>
7/3/18	Long Island Sound 2 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
7/10/18	Long Island Sound 3	<i>In situ</i>
7/17/18	Long Island Sound 4 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
7/24/18	Long Island Sound 5	<i>In situ</i>
7/31/18	Long Island Sound 6 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
8/7/18	Long Island Sound 7	<i>In situ</i>
8/14/18	Long Island Sound 8 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
8/21/18	Long Island Sound 9	<i>In situ</i>
8/28/18	Long Island Sound 10 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
9/4/18	Long Island Sound 11	<i>In situ</i>
9/11/18	Long Island Sound 12 and Nutrients	<i>In situ</i> , 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.

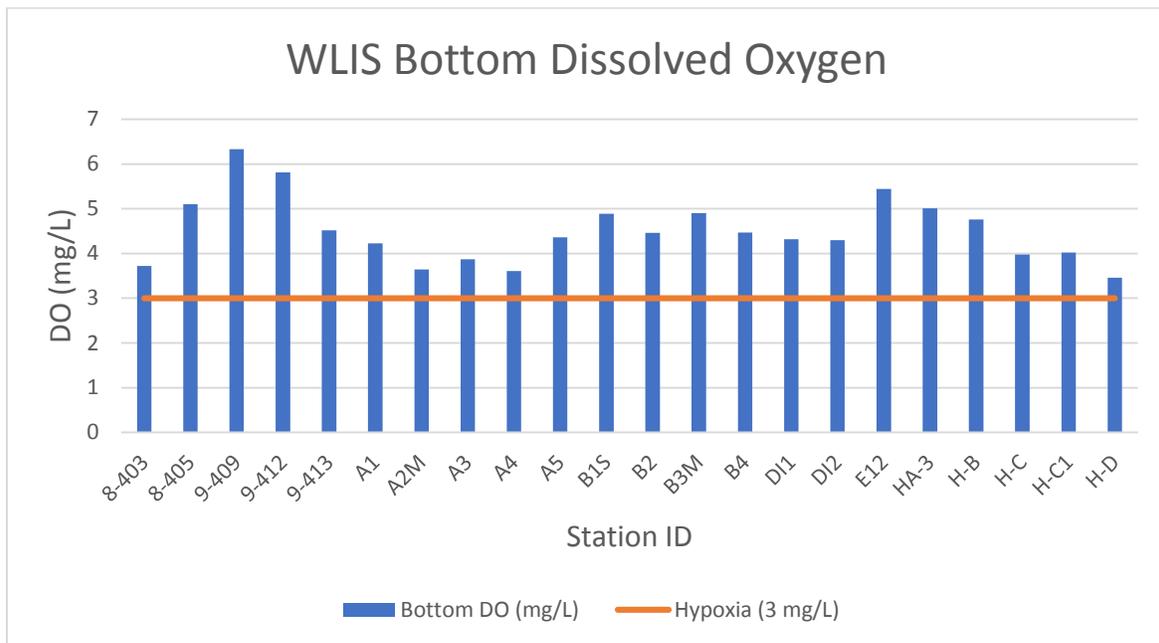
SURVEY # 3 AT A GLANCE

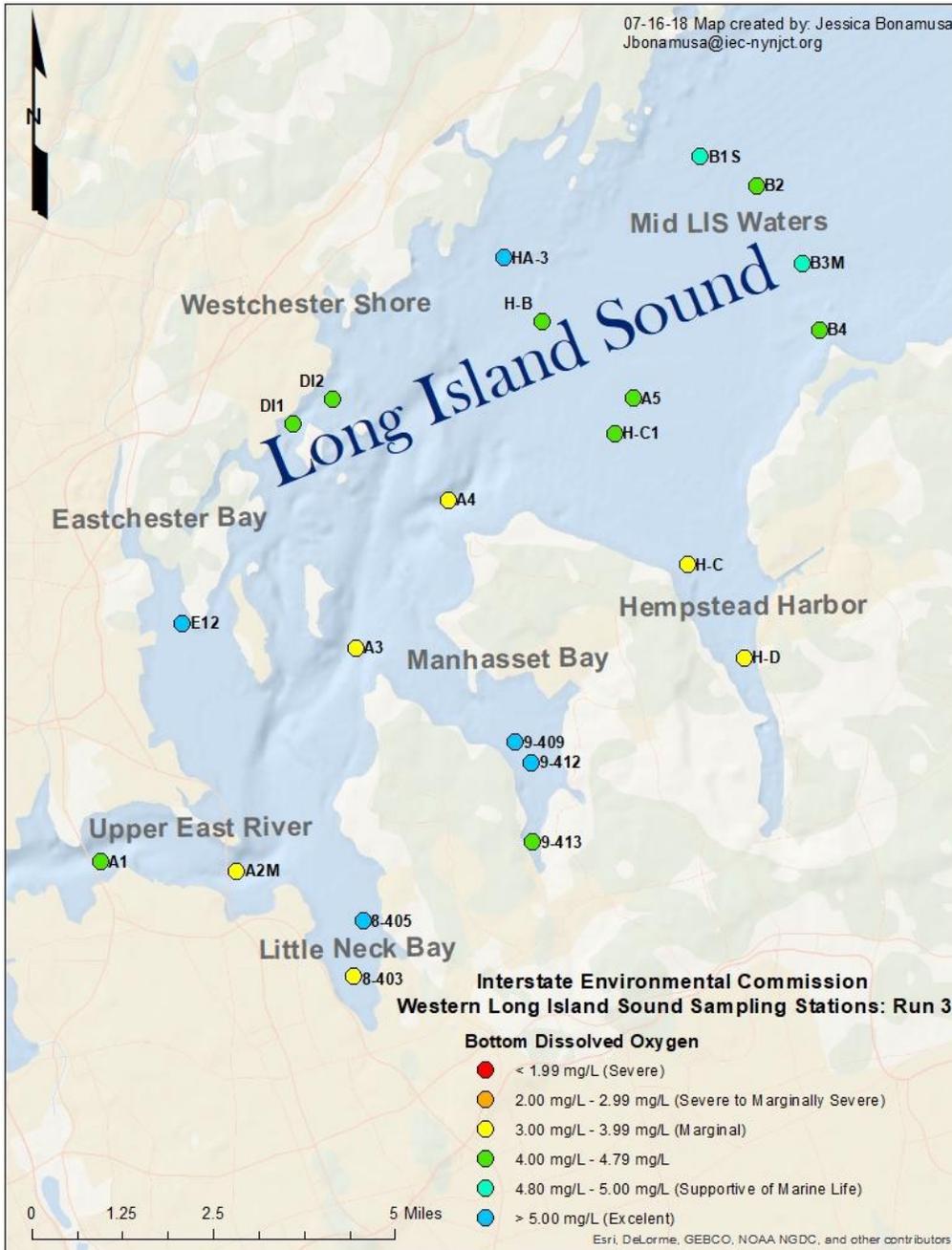
Hypoxia (DO <3.00 mg/L)	No sites exhibited hypoxia.
Lowest Surface DO concentration	4.79 mg/L
Lowest bottom DO concentration	3.46 mg/L
Average surface DO concentration	8.36 mg/L
Average bottom DO concentration	4.51 mg/L

Average surface water temperature	20.55 °C
Average bottom water temperature	17.36 °C
Average water column ΔT	3.19 °C
Average surface salinity	26.17 ppt
Average bottom salinity	26.51 ppt

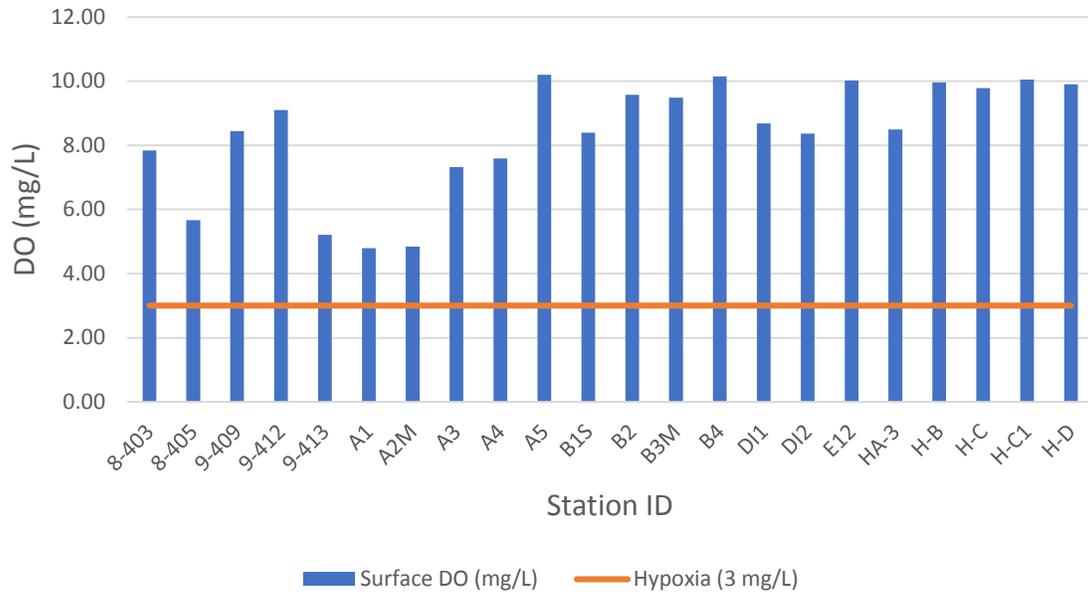
Atmospheric temperatures during the time of the survey ranged between 23.3 and 36.1°C. The weather conditions were sunny. The survey started at 06:07 and ended at 12:20, with low tide at 03:13 and high tide at 08:56 as per NOAA Tide at New Rochelle.

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).





WLIS Surface Dissolved Oxygen





SECCHI DISK DEPTH

Secchi disk measurements ranged from 2.0 feet to 6.0 feet. The highest readings were taken at stations A1, DI-2, H-A3 and B1S. 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.

July 2018

Ambient Water Quality Monitoring in the Western Long Island Sound

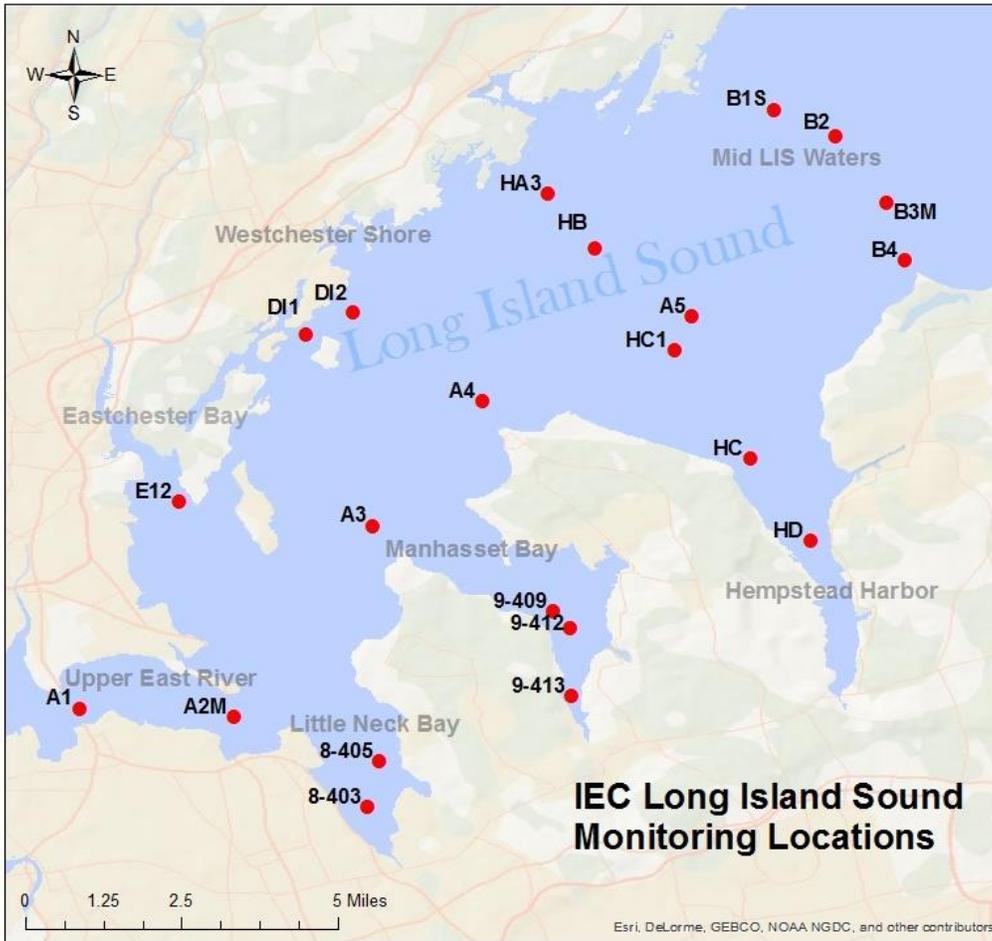
SURVEY 4: 7/18/2018

INVESTIGATION NUMBER: 17803

Jessica Halev



**Interstate
Environmental
Commission**
NY · NJ · CT



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
D11	40.8883	-73.7748
D12	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	<i>In situ</i>
7/3/18	Long Island Sound 2 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
7/10/18	Long Island Sound 3	<i>In situ</i>
7/17/18	Long Island Sound 4 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
7/24/18	Long Island Sound 5	<i>In situ</i>
7/31/18	Long Island Sound 6 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
8/7/18	Long Island Sound 7	<i>In situ</i>
8/14/18	Long Island Sound 8 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
8/21/18	Long Island Sound 9	<i>In situ</i>
8/28/18	Long Island Sound 10 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
9/4/18	Long Island Sound 11	<i>In situ</i>
9/11/18	Long Island Sound 12 and Nutrients	<i>In situ</i> , 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.

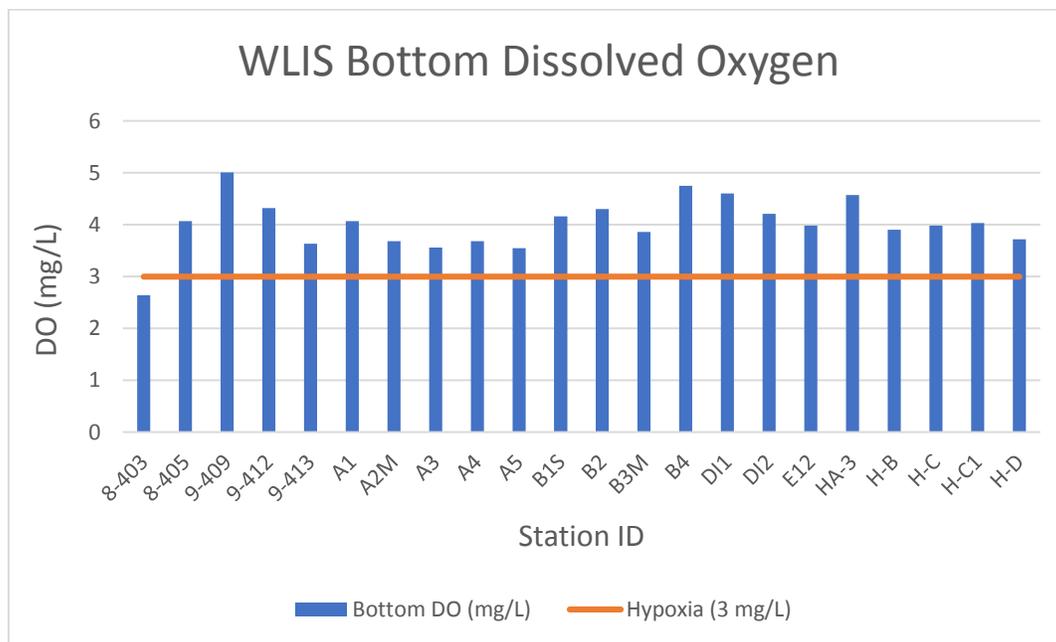
SURVEY # 4 AT A GLANCE

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

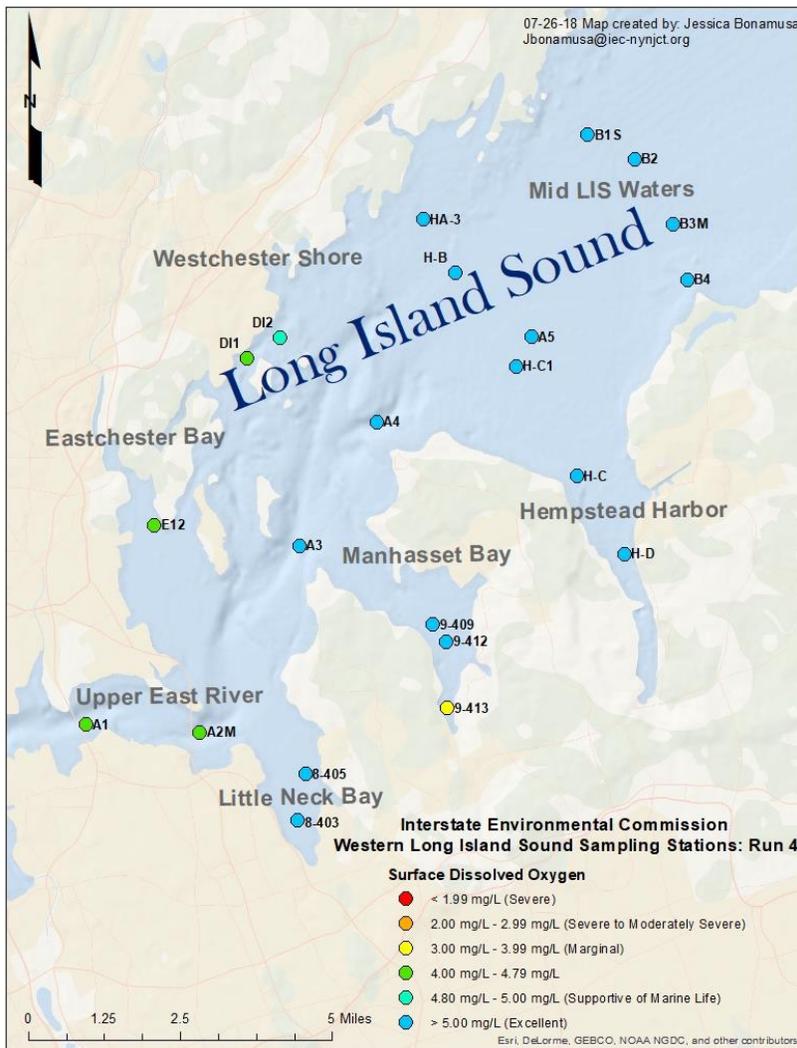
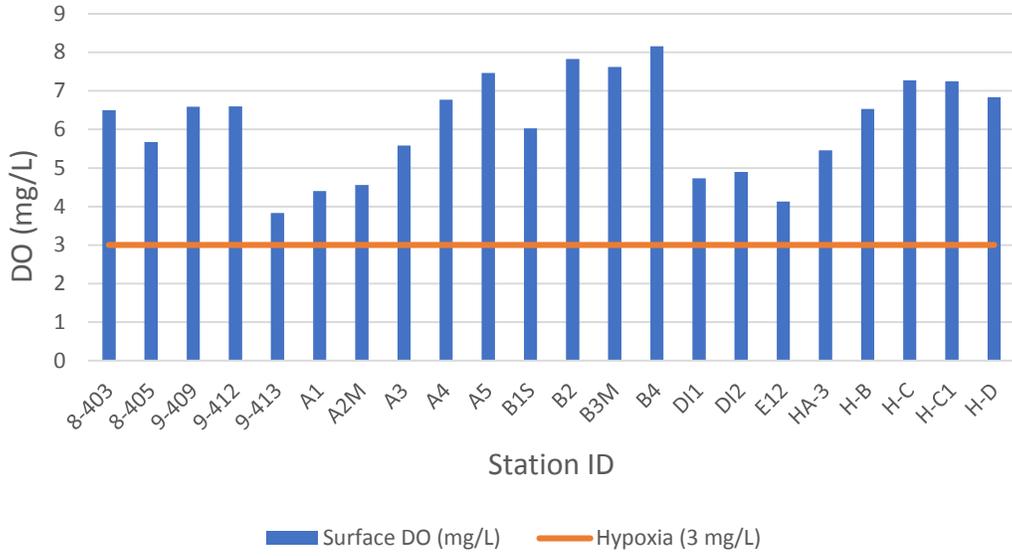
Atmospheric temperatures during the time of the survey ranged between 19.4 and 30°C. The weather conditions were partly cloudy. The survey started at 06:12 and ended at 10:21, with low tide at 10:51 and high tide at 04:07 as per NOAA Tide at New Rochelle.

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).





WLIS Surface Dissolved Oxygen



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.

July 2018

Ambient Water Quality Monitoring in the Western Long Island Sound

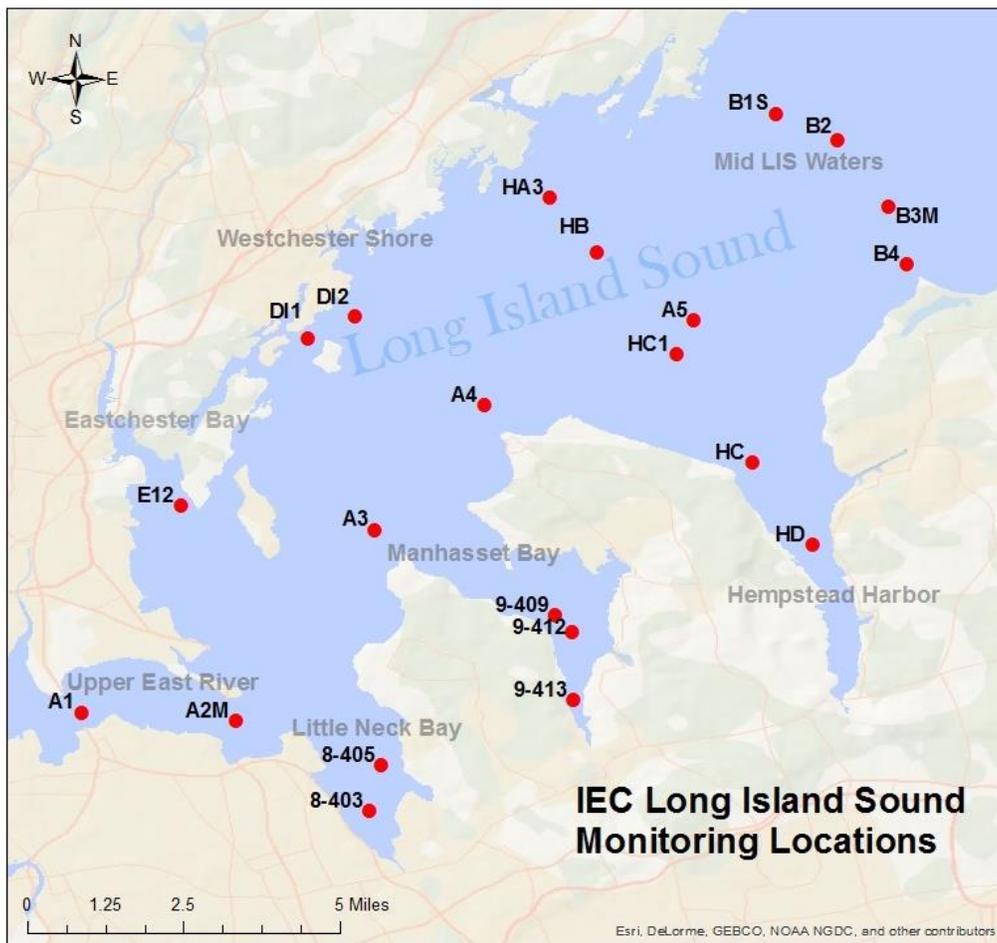
SURVEY 5: 7/24/2018

INVESTIGATION NUMBER: 17806

Steven Weber



**Interstate
Environmental
Commission**
NY · NJ · CT



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.

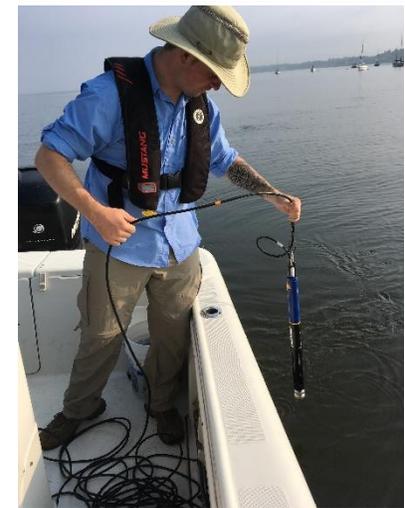
During the summer 2018, IEC staff will perform 12 weekly surveys each summer of 22 stations in the far western Long Island Sound. The 12 surveys will include weekly *in situ* measurements of water temperature, salinity, dissolved oxygen, pH, and Secchi disk depth. Measurements at each station will be 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.

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

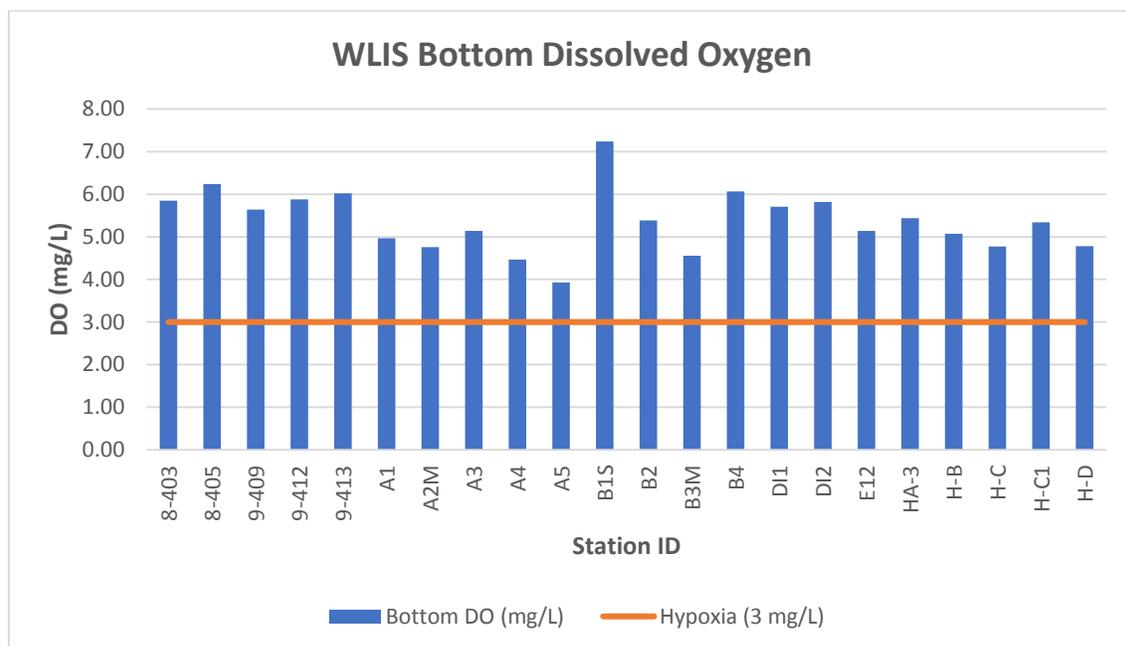
SURVEY # 5 AT A GLANCE

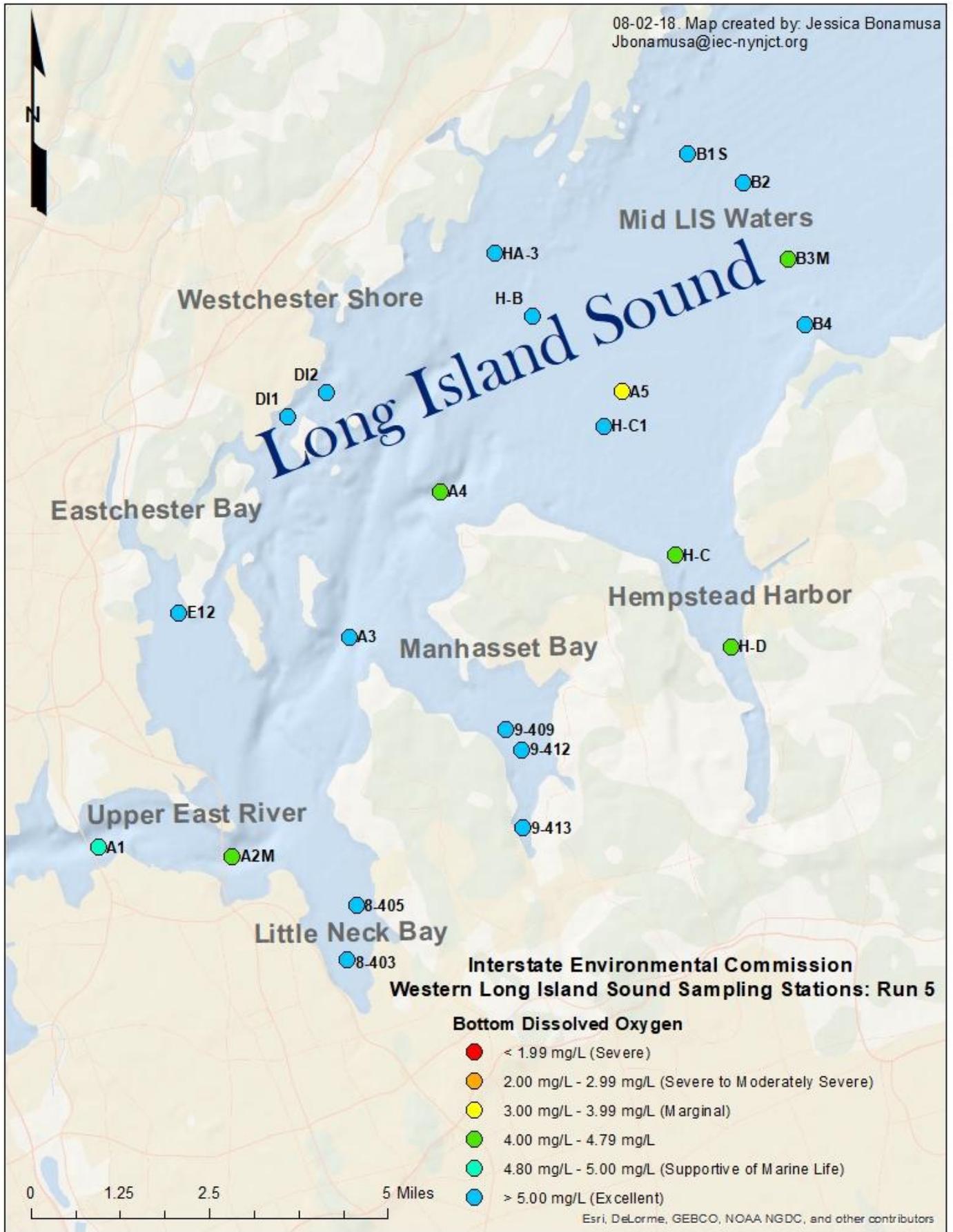
Hypoxia (DO <3.00 mg/L)	No sites exhibited hypoxia.
Lowest Surface DO concentration	4.98 mg/L
Lowest bottom DO concentration	3.93 mg/L
Average surface DO concentration	6.45 mg/L
Average bottom DO concentration	5.27 mg/L

Average surface water temperature	22.29 °C
Average bottom water temperature	21.45 °C
Average water column ΔT	0.29 °C
Average surface salinity	26.48 ppt
Average bottom salinity	27.02 ppt

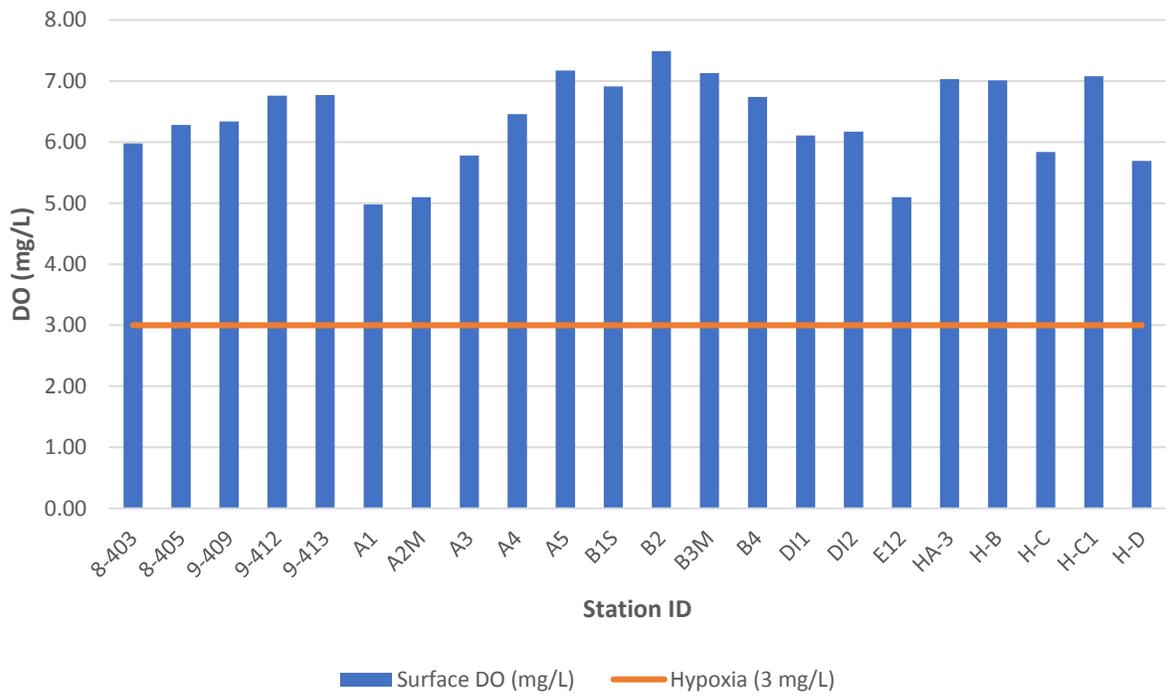
Atmospheric temperatures during the time of the survey ranged between 25 and 30.6°C. The weather conditions were mostly cloudy. The survey started at 05:59 and ended at 10:27, with low tide at 04:12 and high tide at 10:09 as per NOAA Tide at New Rochelle.

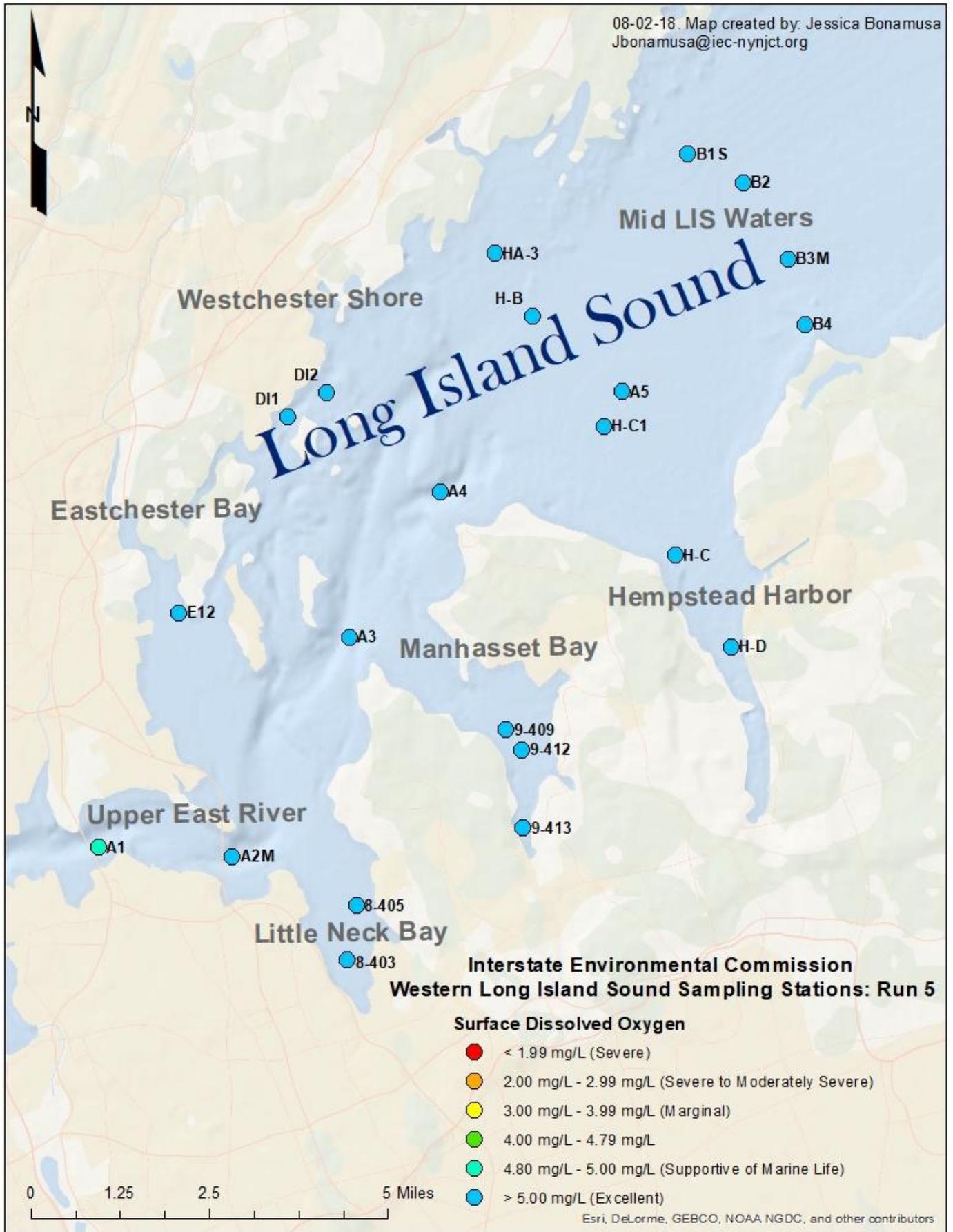
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WLIS Surface Dissolved Oxygen





SECCHI DISK DEPTH

Secchi disk measurements ranged from 2.5 feet to 5.5 feet. The deepest reading was taken at station B4. The shallowest reading was taken at station 8-403 in Little Neck 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.

July 2018

Ambient Water Quality Monitoring in the Western Long Island Sound

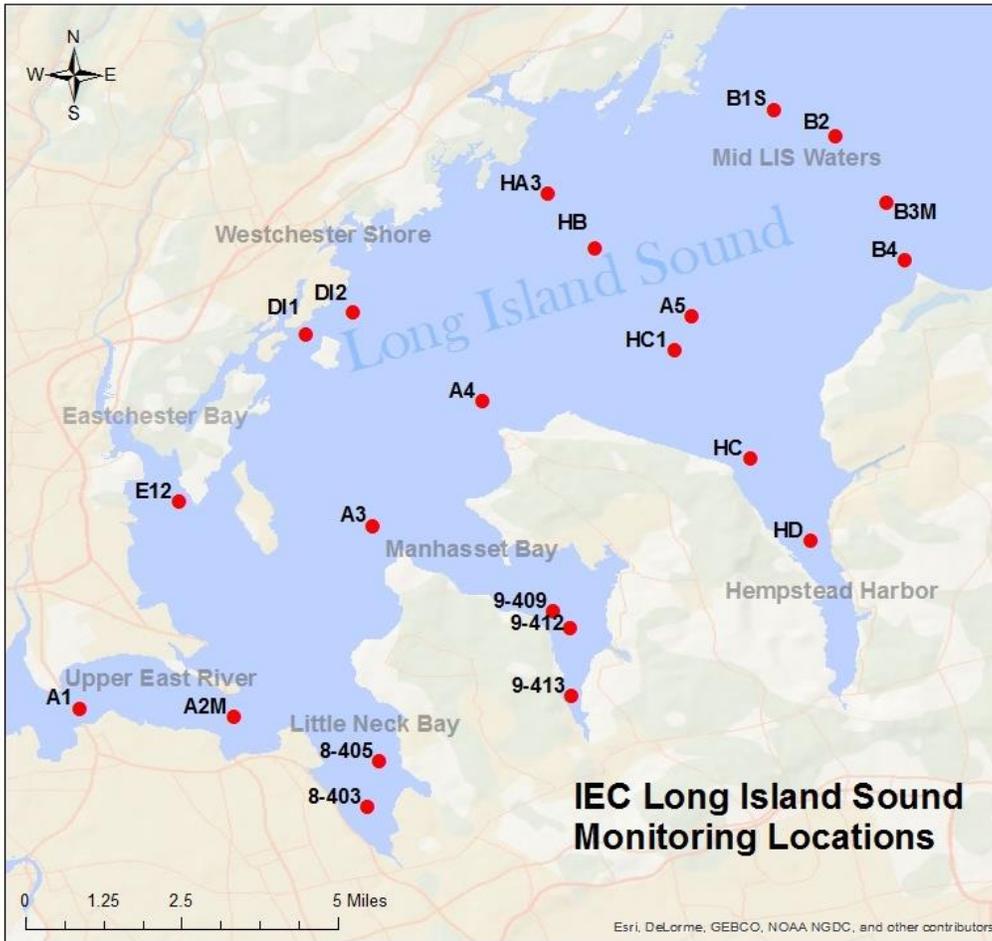
SURVEY 6: 7/31/2018

INVESTIGATION NUMBER: 17811

Steven Weber



**Interstate
Environmental
Commission**
NY · NJ · CT



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
D11	40.8883	-73.7748
D12	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.

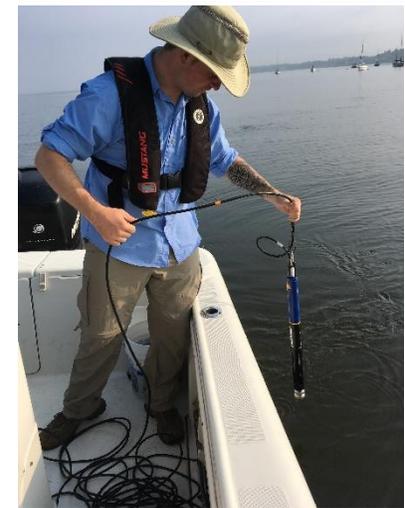
During the summer 2018, IEC staff will perform 12 weekly surveys each summer of 22 stations in the far western Long Island Sound. The 12 surveys will include weekly *in situ* measurements of water temperature, salinity, dissolved oxygen, pH, and Secchi disk depth. Measurements at each station will be 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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epowers@iec-nynjct.org

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

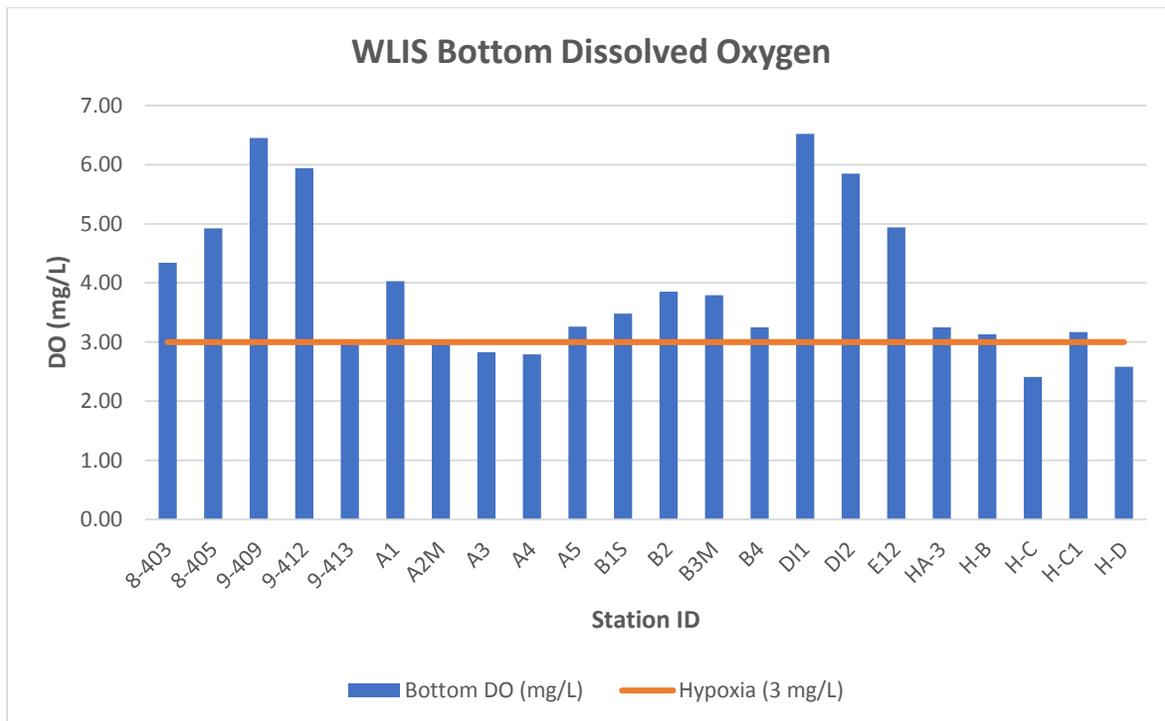
SURVEY # 6 AT A GLANCE

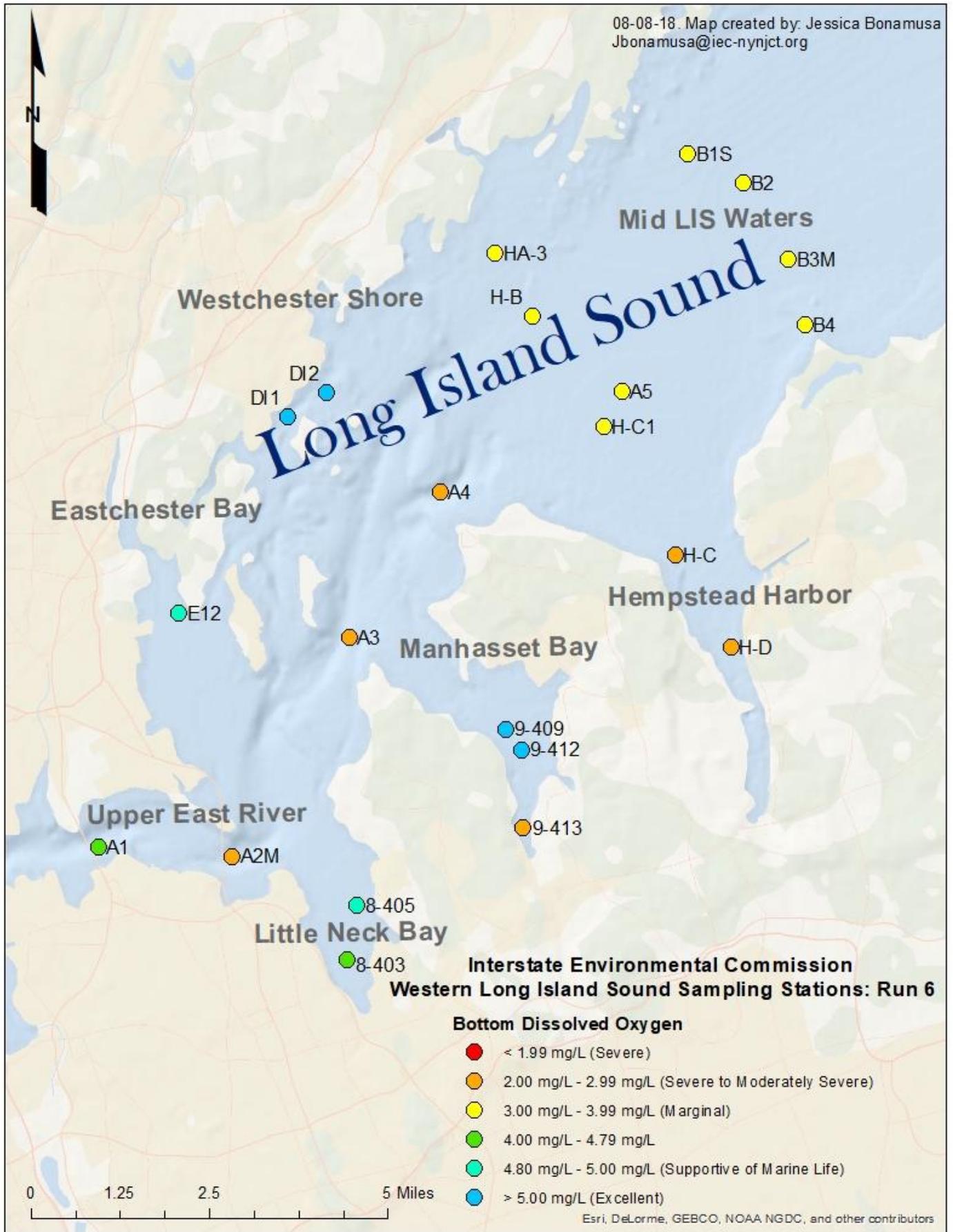
Hypoxia (DO <3.00 mg/L)	Six sites exhibited hypoxia at bottom depths: 2.99mg/L at site 9-413; 2.83 mg/L at site A3; 2.97 mg/L at site A2M; 2.58 mg/L at site H-D; 2.41 mg/L at site H-C; and 2.79 mg/L at site A4. One site, 9-413, exhibited hypoxia at the surface as well with a DO concentration of 1.95 mg/L
Lowest Surface DO concentration	1.95 mg/L
Lowest bottom DO concentration	2.41 mg/L

Average surface DO concentration	6.68 mg/L
Average bottom DO concentration	3.94 mg/L
Average surface water temperature	23.11 °C
Average bottom water temperature	22.05 °C
Average water column ΔT	1.05 °C
Average surface salinity	26.69 ppt
Average bottom salinity	27.27 ppt

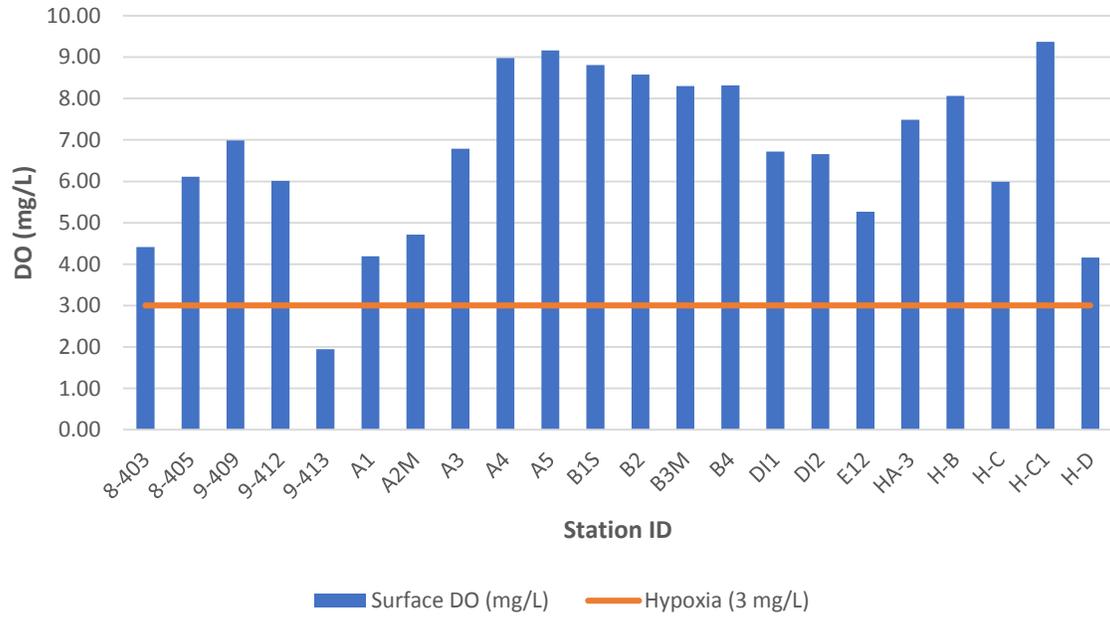
Atmospheric temperatures during the time of the survey ranged between 20.6 °C and 26.1°C. The weather conditions were mostly sunny. The survey started at 06:07 and ended at 09:39, with low tide at 01:25 and high tide at 07:24 as per NOAA Tide at New Rochelle.

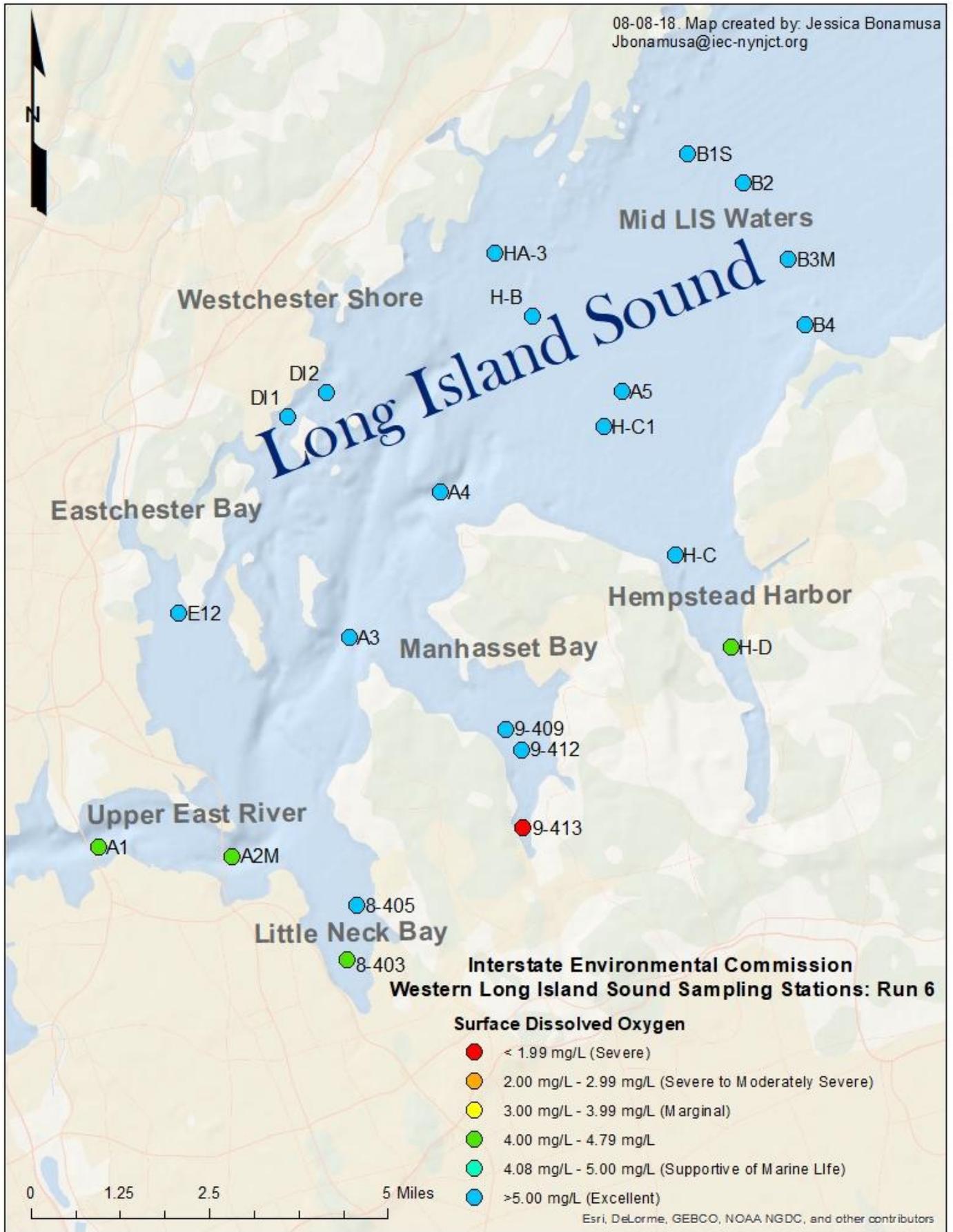
Marine organisms need oxygen to live, and low concentrations can have serious consequences for a marine ecosystem. Hypoxia occurs when dissolved oxygen (“DO”) concentrations become low. The Long Island Sound Study defines hypoxia as DO values which are below a concentration of 3.00 mg/L (EPA, 2000).





WLIS Surface Dissolved Oxygen





**Interstate Environmental Commission
Western Long Island Sound Sampling Stations: Run 6**

Station ID	TSS (mg/L)
9-413	7.7
9-412	9.48
9-409	8.10
A3	6.68
8-405	9.38
8-403	13.94
A2M	5.26
A1	8.78
E-12	12.34
DI-1	13.8
DI-2	9.16
H-A3	6.52
H-B	10.06
B1S	7.68
B2	8.7
B3M	8.98
B4	8.96
H-D	5.48
H-C	7.82
H-C1	11.36
A5	10.28
A4	8.34
DI-2 dup	N/A

Station ID	BOD (mg/L)
9-412	3.56
8-403	3.00
A2M	<3.0
E-12	<3.0
DI-2	<3.0
H-A3	3.31
B1S	<3.0
B3M	<3.0
H-D	<3.0
A5	3.75
A4	3.06
DI-2 dup	<3.0

SECCHI DISK DEPTH

Secchi disk measurements ranged from 2.5 feet to 7.0 feet. The deepest readings were taken at stations 9-413 and A1. The shallowest readings were taken at stations 9-409, 9-412 in Manhasset Bay, and 8-403 in Little Neck 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.

August 2018

Ambient Water Quality Monitoring in the Western Long Island Sound

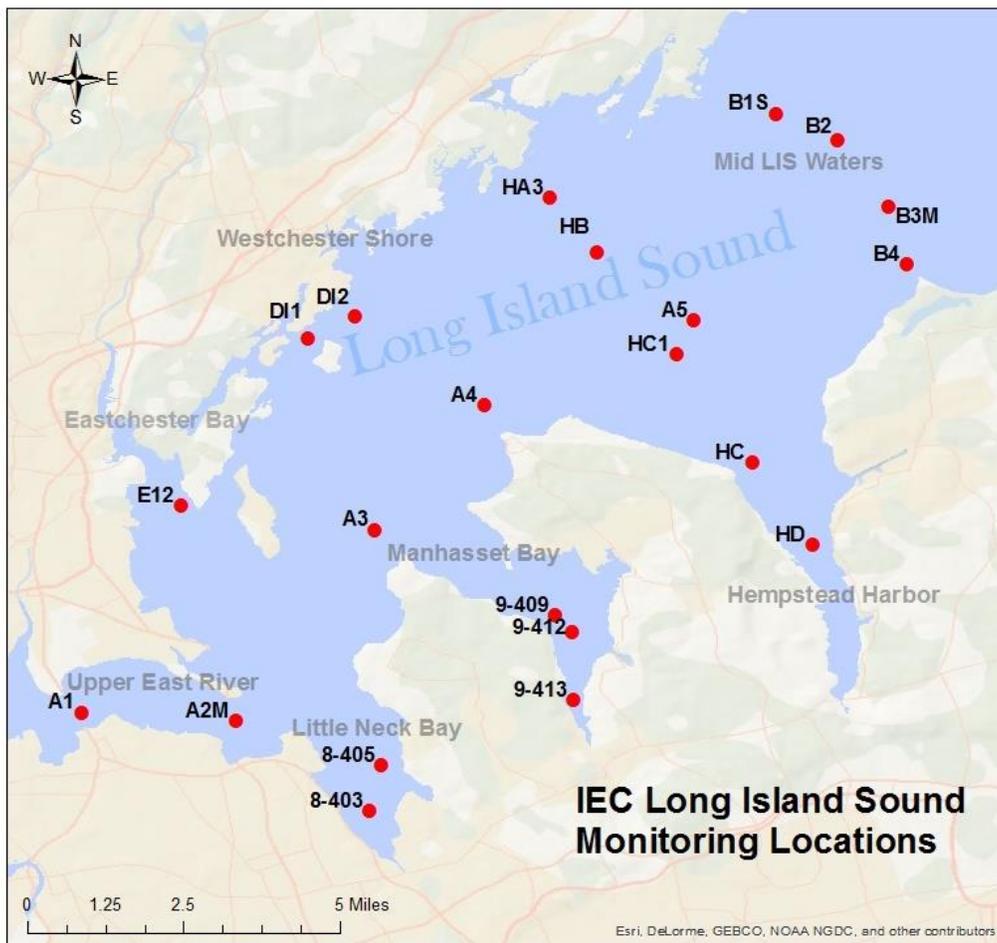
SURVEY 7: 8/7/2018

INVESTIGATION NUMBER: 17816

Steven Weber



**Interstate
Environmental
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NY · NJ · CT



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
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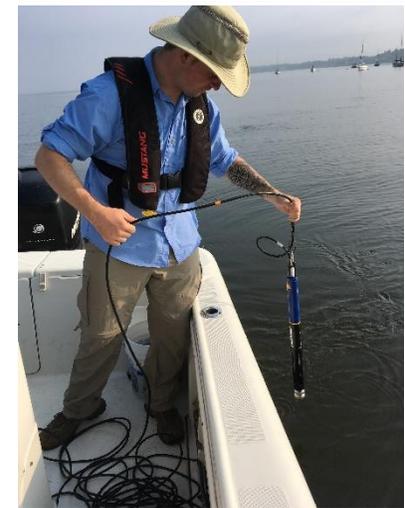
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Date	Survey Number	Parameters
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7/3/18	Long Island Sound 2 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
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7/17/18	Long Island Sound 4 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
7/24/18	Long Island Sound 5	<i>In situ</i>
7/31/18	Long Island Sound 6 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
8/7/18	Long Island Sound 7	<i>In situ</i>
8/14/18	Long Island Sound 8 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
8/21/18	Long Island Sound 9	<i>In situ</i>
8/28/18	Long Island Sound 10 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
9/4/18	Long Island Sound 11	<i>In situ</i>
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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 # 7 AT A GLANCE

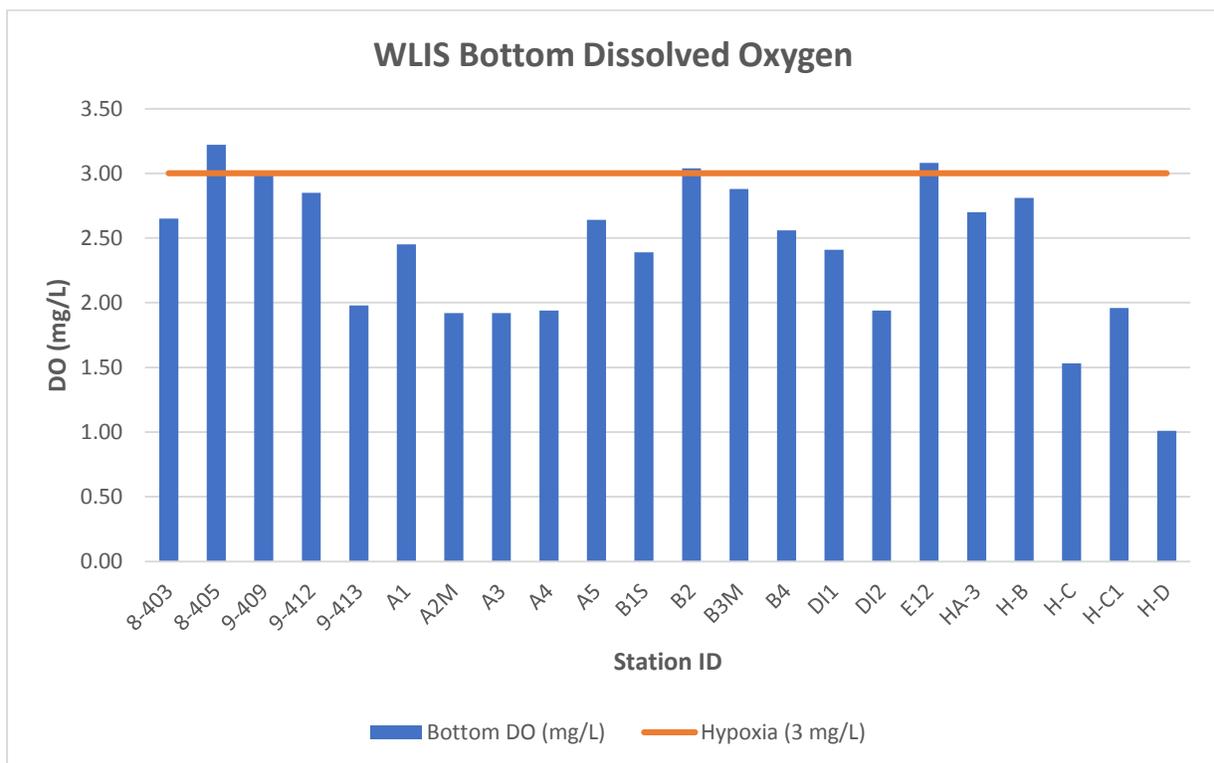
Hypoxia (DO <3.00 mg/L)	Eighteen sites exhibited hypoxic conditions. (See Note A)
Lowest Surface DO concentration	3.17 mg/L
Lowest bottom DO concentration	1.01 mg/L
Average surface DO concentration	7.77 mg/L
Average bottom DO concentration	2.46 mg/L

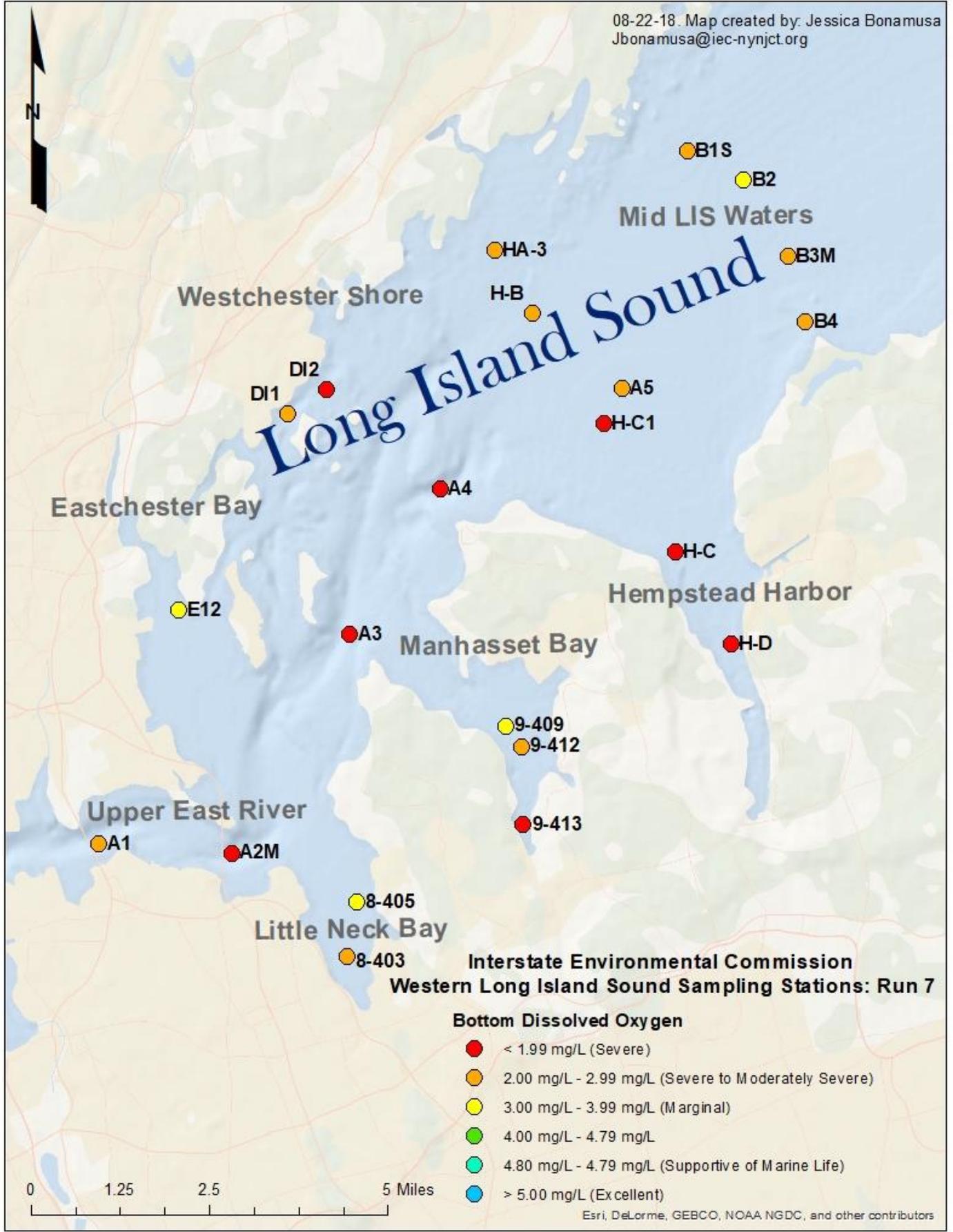
Average surface water temperature	24.36 °C
Average bottom water temperature	21.39 °C
Average water column ΔT	2.97 °C
Average surface salinity	26.85 ppt
Average bottom salinity	27.83 ppt

****NOTE A**** Eighteen sites (9-413, 9-412, A3, 8-403, A2M, A1, DI1, DI2, H-A3, H-B, B1S, B3M, B4, H-D, H-C, H-C1, A5, A4) were found to be hypoxic at bottom depth. Eleven of these sites (9-413, A3, A2M, DI2, H-A3, H-B, B1S, B3M, B4, A4, B3M) also exhibited hypoxia at the middle of the water column. No sites exhibited hypoxia at the surface.

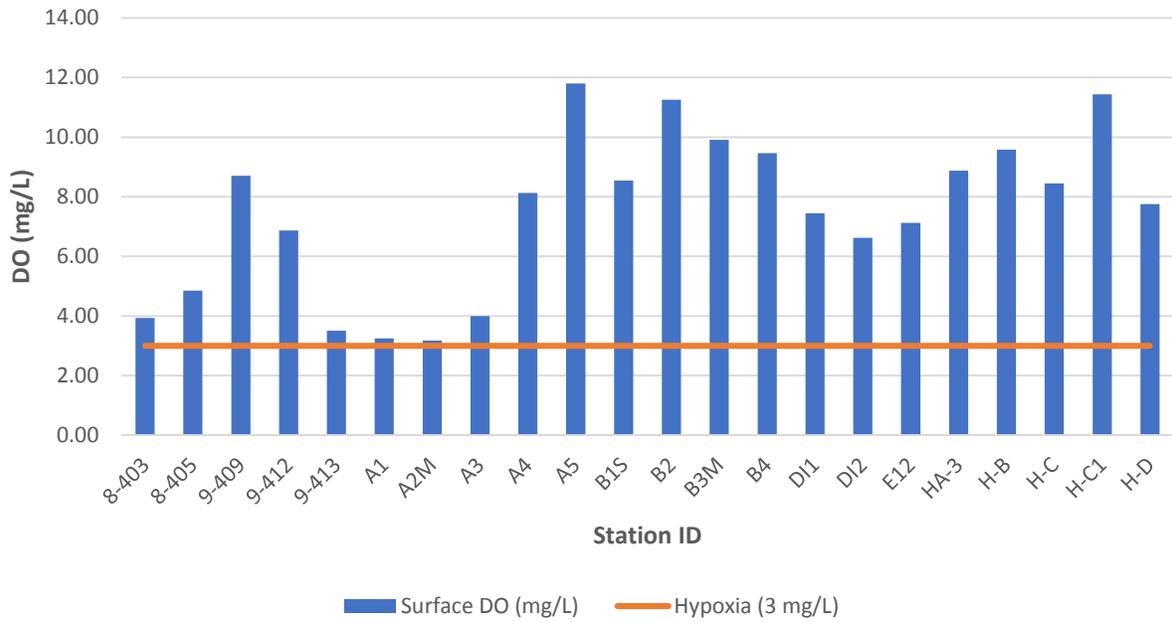
Atmospheric temperatures during the time of the survey ranged between 22.22°C and 26.67°C. The weather conditions were cloudy. The survey started at 06:03 and ended at 10:13, with low tide at 08:32 and high tide at 01:47 as per NOAA Tide at New Rochelle.

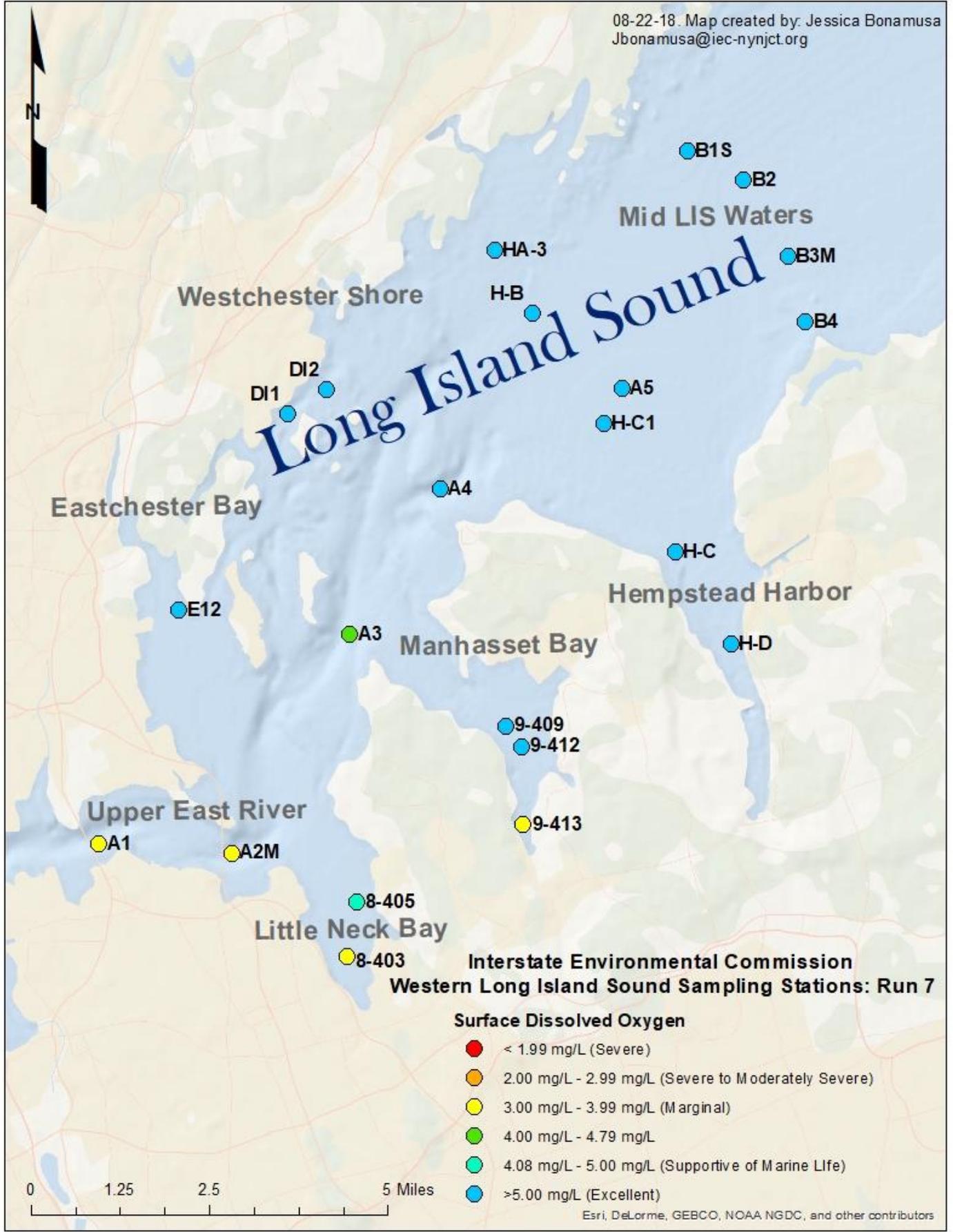
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WLIS Surface Dissolved Oxygen





SECCHI DISK DEPTH

Secchi disk measurements ranged from 2.5 feet to 6.5 feet. The deepest readings were taken at stations A2M and A1. The shallowest readings were taken at stations 9-413 and 9-412.

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.

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Ambient Water Quality Monitoring in the Western Long Island Sound

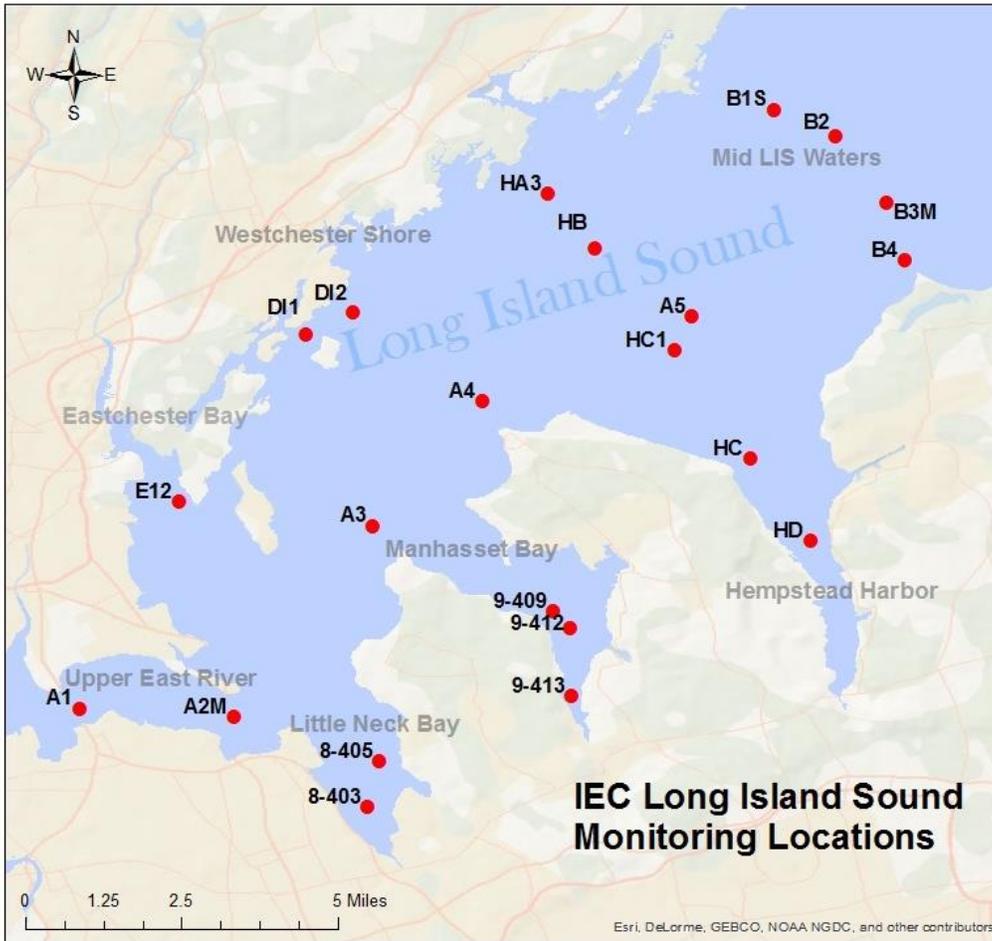
SURVEY 8: 8/14/2018

INVESTIGATION NUMBER: 17821

Steven Weber



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STATION	LATITUDE DD	LONGITUDE DD
E-12	40.8487	-73.8045
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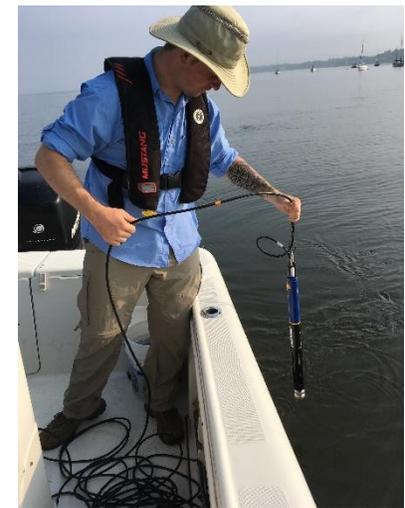
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Date	Survey Number	Parameters
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7/17/18	Long Island Sound 4 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
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7/31/18	Long Island Sound 6 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
8/7/18	Long Island Sound 7	<i>In situ</i>
8/14/18	Long Island Sound 8 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
8/21/18	Long Island Sound 9	<i>In situ</i>
8/28/18	Long Island Sound 10 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
9/4/18	Long Island Sound 11	<i>In situ</i>
9/11/18	Long Island Sound 12 and Nutrients	<i>In situ</i> , 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 # 8 AT A GLANCE

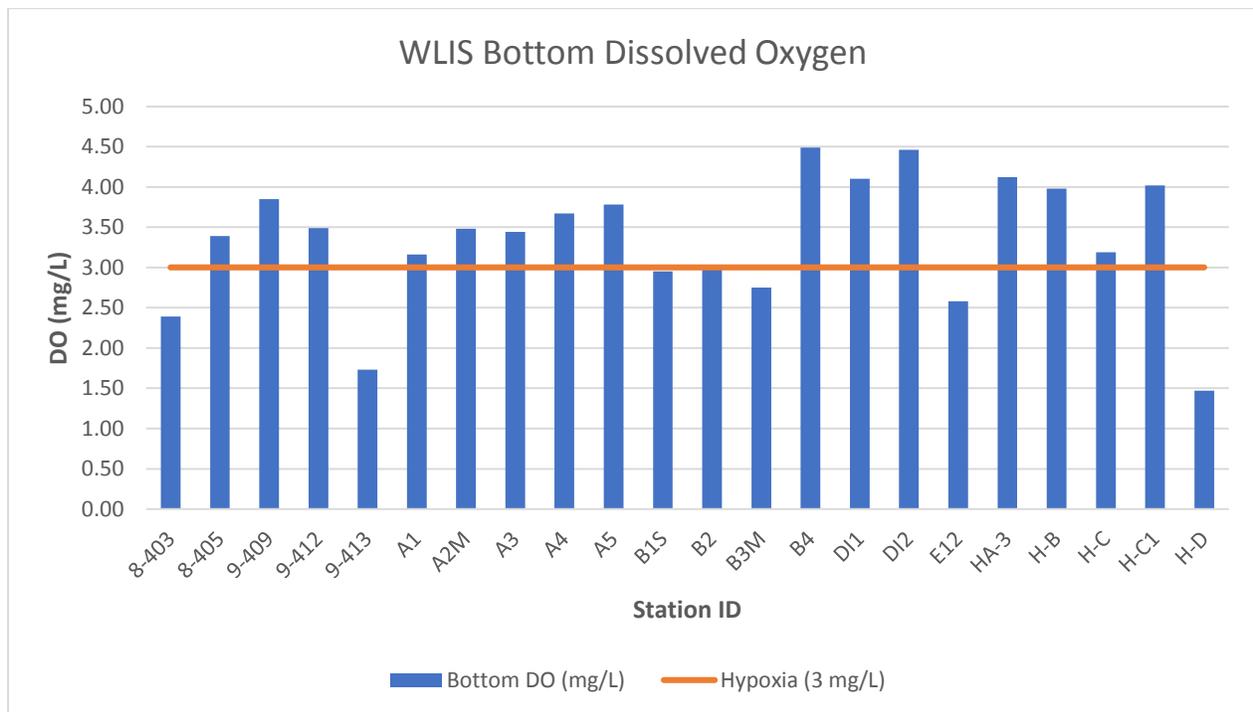
Hypoxia (DO <3.00 mg/L)	Six sites exhibited hypoxic conditions. (See Note A)
Lowest Surface DO concentration	1.11 mg/L
Lowest bottom DO concentration	1.47 mg/L
Average surface DO concentration	4.30 mg/L
Average bottom DO concentration	3.30 mg/L

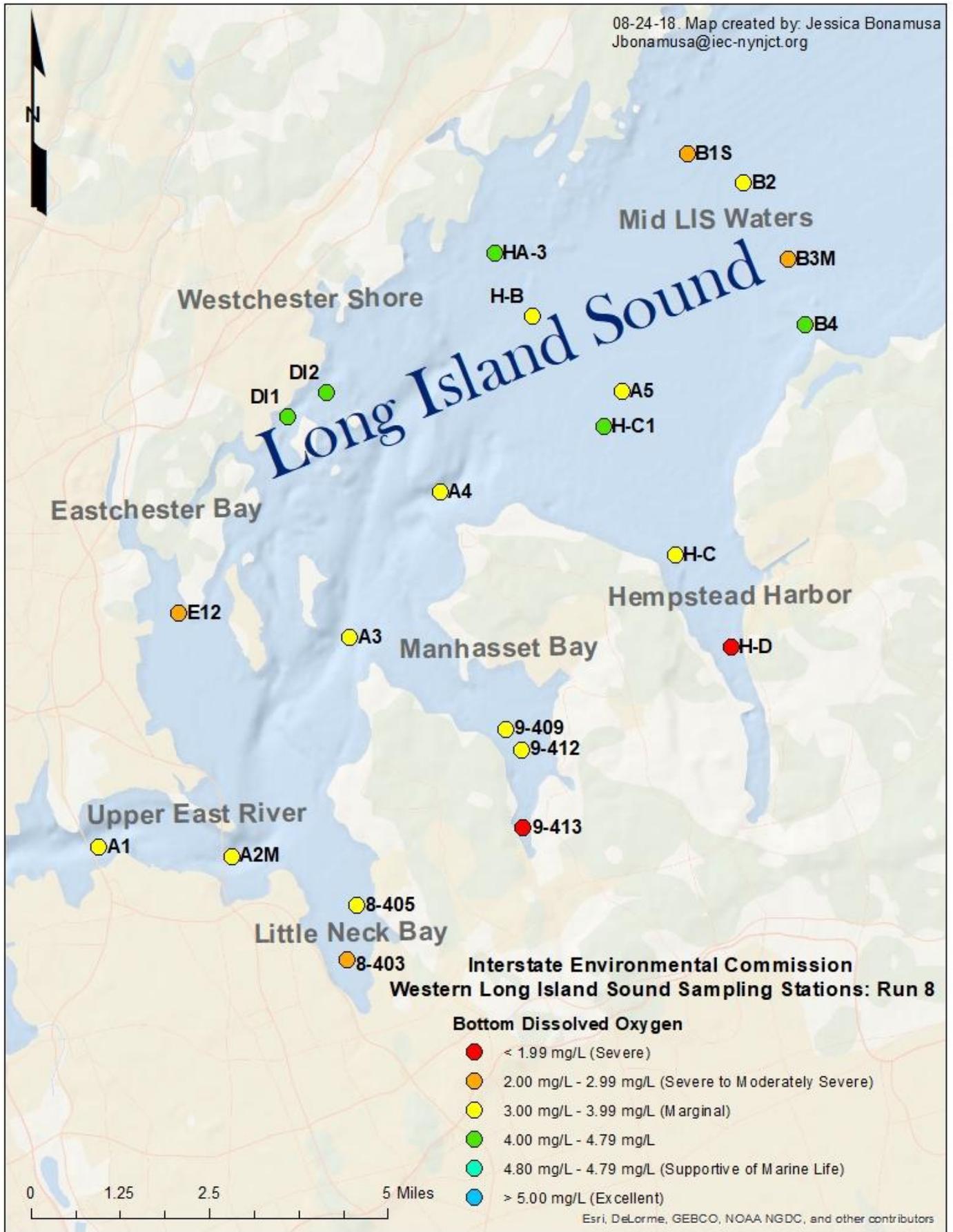
Average surface water temperature	23.51 °C
Average bottom water temperature	23.03 °C
Average water column ΔT	0.49 °C
Average surface salinity	26.35 ppt
Average bottom salinity	26.61 ppt

****NOTE A**** Six sites (9-413, 8-403, E-12, B-1S, B3M, H-D) were found to be hypoxic at bottom depth. Four of these sites (9-413, 8-403, E-12, H-D) also exhibited hypoxia at the surface. Site H-D was hypoxic at the middle water column as well.

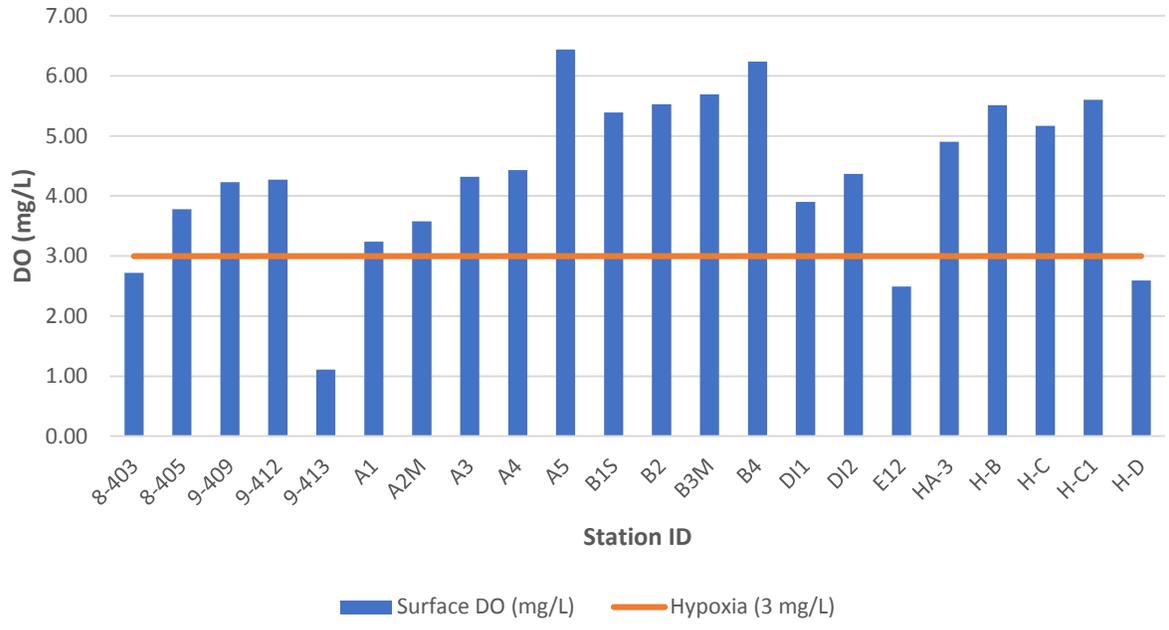
Atmospheric temperatures during the time of the survey ranged between 24.4 and 30°C. The weather conditions were hazy. The survey started at 05:59 and ended at 10:46, with low tide at 01:34 and high tide at 07:24 as per NOAA Tide at New Rochelle.

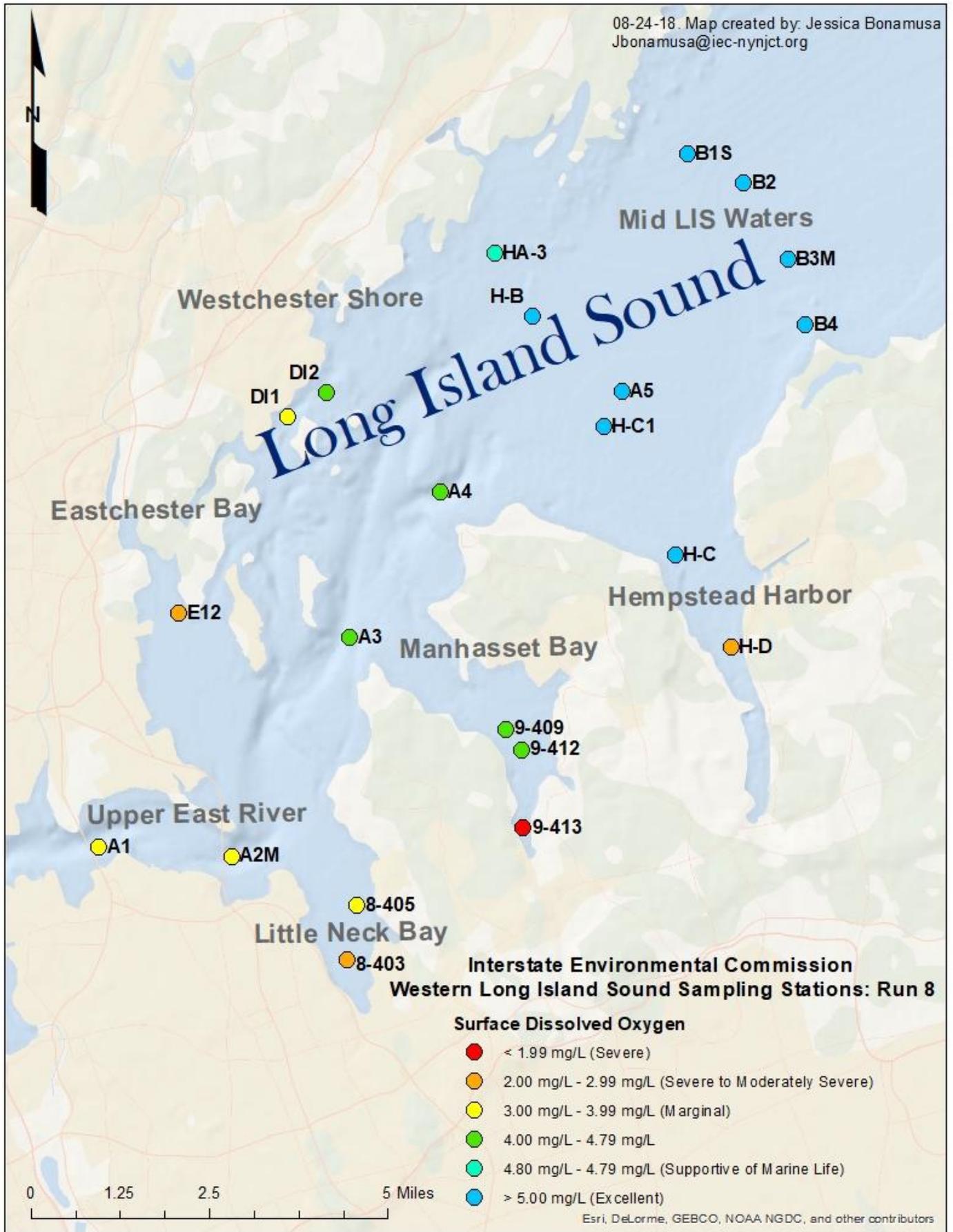
Marine organisms need oxygen to live, and low concentrations can have serious consequences for a marine ecosystem. Hypoxia occurs when dissolved oxygen (“DO”) concentrations become low. The Long Island Sound Study defines hypoxia as DO values which are below a concentration of 3.00 mg/L (EPA, 2000).





WLIS Surface Dissolved Oxygen





Station ID	TSS (mg/L)
9-413	13.86
9-412	16.92
9-409	17.08
A3	16.92
8-405	16.66
8-403	19.50
A2M	10.56
A1	10.54
E-12	8.68
DI-1	8.26
DI-2	6.56
H-A3	7.86
H-B	7.62
B1S	8.80
B2	6.88
B3M	7.42
B4	7.90
H-D	9.72
H-C	9.80
H-C1	10.28
A5	**5.72**
A4	13.36
H-A3 dup	10.66

****Note****- Station A5 TSS is estimated due to final filter residue totaling less than 3.5 mg.

Station ID	BOD (mg/L)
9-412	3.07
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
DI-2 dup	<3.0

SECCHI DISK DEPTH

Secchi disk measurements ranged from 3.0 feet to 7.0 feet. The deepest reading was taken at station B3M. The shallowest readings were taken at stations 9-409, 8-403, and H-D.

CITATIONS

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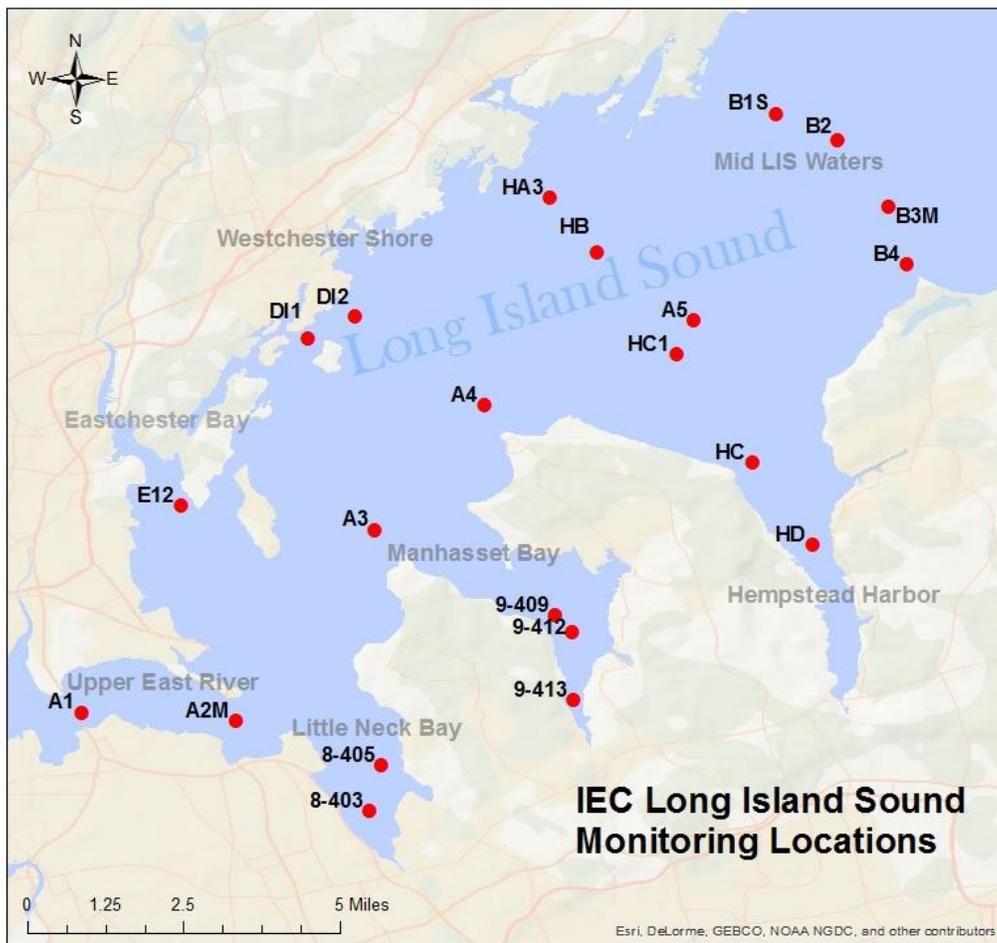
SURVEY 9: 8/21/2018

INVESTIGATION NUMBER: 17824

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E-12	40.8487	-73.8045
A1	40.8013	-73.8268
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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.

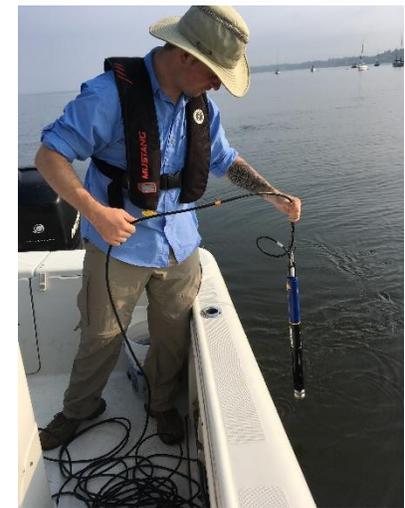
During the summer 2018, IEC staff will perform 12 weekly surveys each summer of 22 stations in the far western Long Island Sound. The 12 surveys will include weekly *in situ* measurements of water temperature, salinity, dissolved oxygen, pH, and Secchi disk depth. Measurements at each station will be 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	<i>In situ</i>
7/3/18	Long Island Sound 2 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
7/10/18	Long Island Sound 3	<i>In situ</i>
7/17/18	Long Island Sound 4 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
7/24/18	Long Island Sound 5	<i>In situ</i>
7/31/18	Long Island Sound 6 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
8/7/18	Long Island Sound 7	<i>In situ</i>
8/14/18	Long Island Sound 8 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
8/21/18	Long Island Sound 9	<i>In situ</i>
8/28/18	Long Island Sound 10 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
9/4/18	Long Island Sound 11	<i>In situ</i>
9/11/18	Long Island Sound 12 and Nutrients	<i>In situ</i> , 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 # 9 AT A GLANCE

Hypoxia (DO <3.00 mg/L)	One site exhibited hypoxic conditions. (See Note A)
Lowest Surface DO concentration	2.42 mg/L
Lowest bottom DO concentration	2.42 mg/L
Average surface DO concentration	4.51 mg/L
Average bottom DO concentration	3.86 mg/L

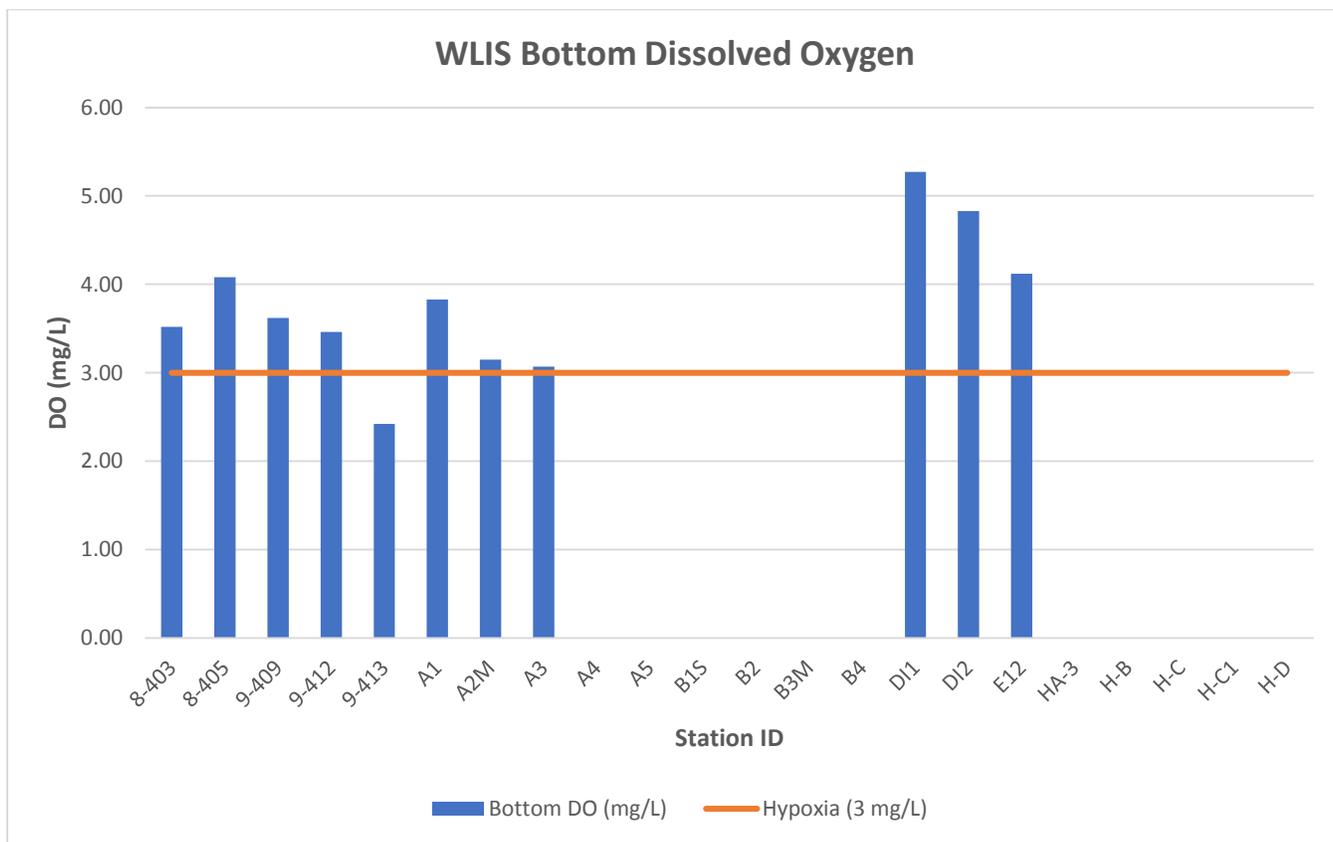
Average surface water temperature	23.51 °C
Average bottom water temperature	23.48 °C
Average water column ΔT	0.04 °C
Average surface salinity	26.08 ppt
Average bottom salinity	26.29 ppt

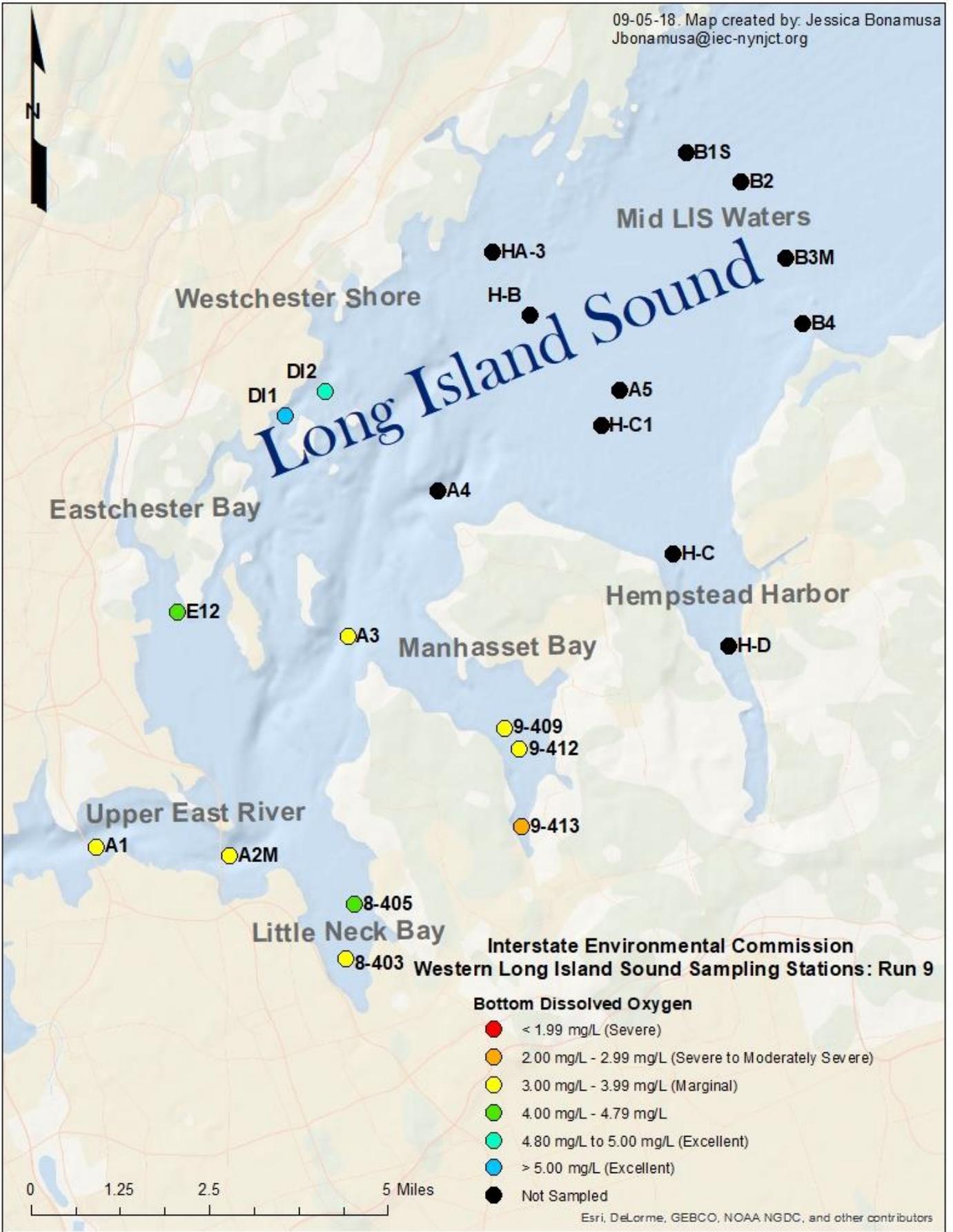
****NOTE A**** Only site 9-413 exhibited hypoxic conditions, which were present at both the bottom and surface of the water column.

Atmospheric temperatures during the time of the survey stayed around 17.78°C. The weather conditions were partly cloudy. The survey started at 06:37 and ended at 9:51, with low tide at 02:53 and high tide at 08:52 as per NOAA Tide at New Rochelle.

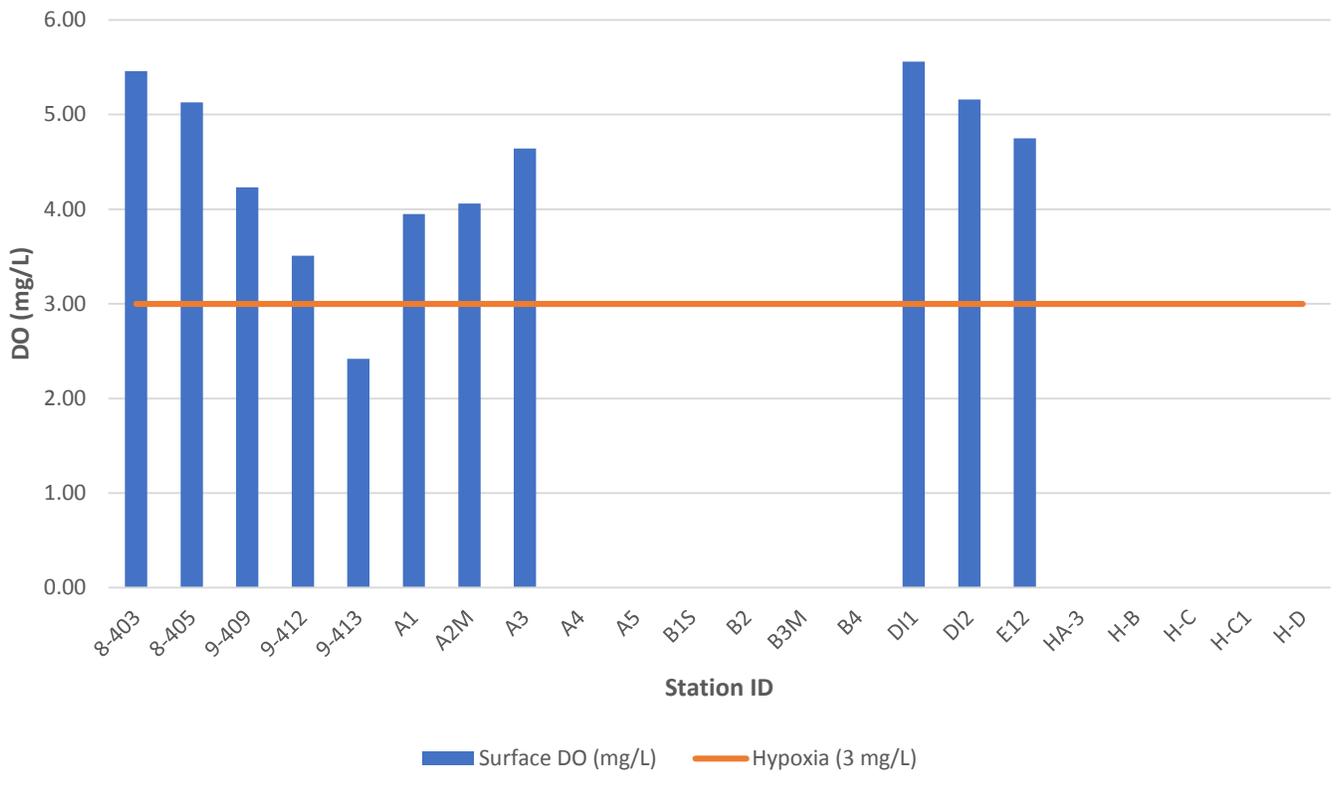
Marine organisms need oxygen to live, and low concentrations can have serious consequences for a marine ecosystem. Hypoxia occurs when dissolved oxygen (“DO”) concentrations become low. The Long Island Sound Study defines hypoxia as DO values which are below a concentration of 3.00 mg/L (EPA, 2000).

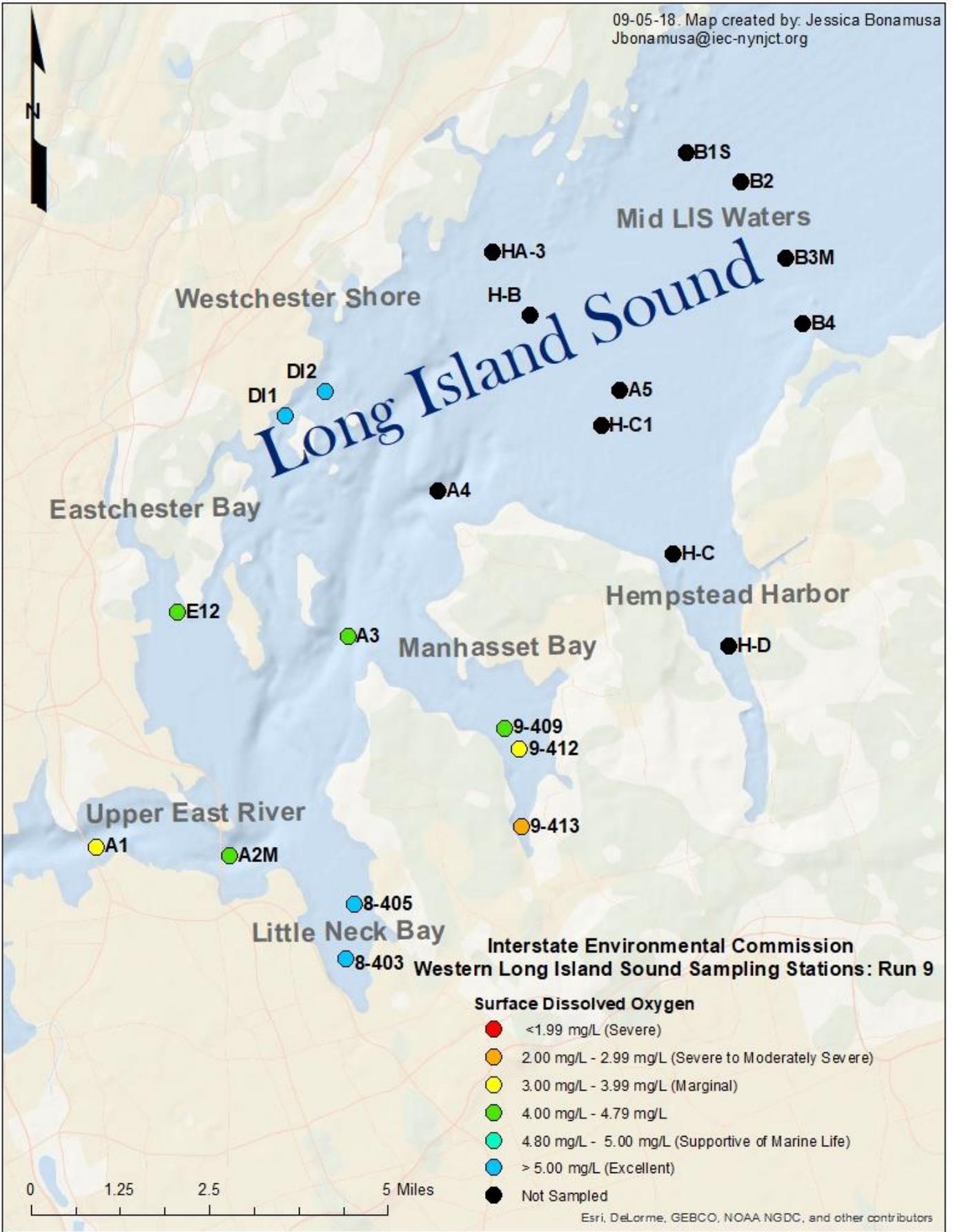
****NOTE B**** Sampling for survey 9 was suspended at station D12 due to an Easterly wind generating unsafe operating conditions.





WLIS Surface Dissolved Oxygen





SECCHI DISK DEPTH

Secchi disk measurements ranged from 3.5 feet to 6.5 feet. The deepest reading was taken at station A2M. The shallowest reading was taken at station 8-403.

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.

August 2018

Ambient Water Quality Monitoring in the Western Long Island Sound

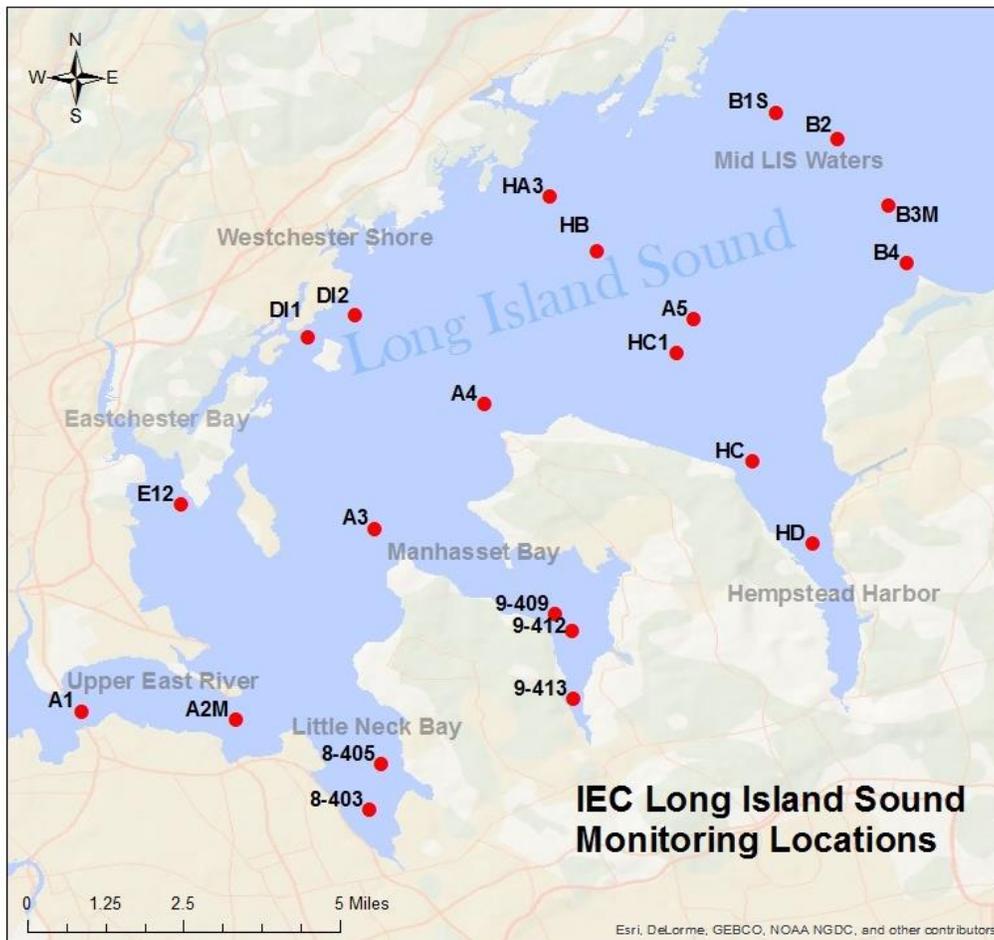
SURVEY 10: 8/28/2018

INVESTIGATION NUMBER: 17831

Steven Weber



**Interstate
Environmental
Commission**
NY · NJ · CT



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
D11	40.8883	-73.7748
D12	40.8930	-73.7642
H-A3	40.9207	-73.7187
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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
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7/17/18	Long Island Sound 4 and Nutrients	<i>In situ</i> , nutrients, chlorophyll <i>a</i> , BOD, TSS
7/24/18	Long Island Sound 5	<i>In situ</i>
7/31/18	Long Island Sound 6 and Nutrients	<i>In situ</i> , nutrients, chlorophyll <i>a</i> , BOD, TSS
8/7/18	Long Island Sound 7	<i>In situ</i>
8/14/18	Long Island Sound 8 and Nutrients	<i>In situ</i> , nutrients, chlorophyll <i>a</i> , BOD, TSS
8/21/18	Long Island Sound 9	<i>In situ</i>
8/28/18	Long Island Sound 10 and Nutrients	<i>In situ</i> , nutrients, chlorophyll <i>a</i> , BOD, TSS
9/4/18	Long Island Sound 11	<i>In situ</i>
9/11/18	Long Island Sound 12 and Nutrients	<i>In situ</i> , nutrients, chlorophyll <i>a</i> , 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 # 10 AT A GLANCE

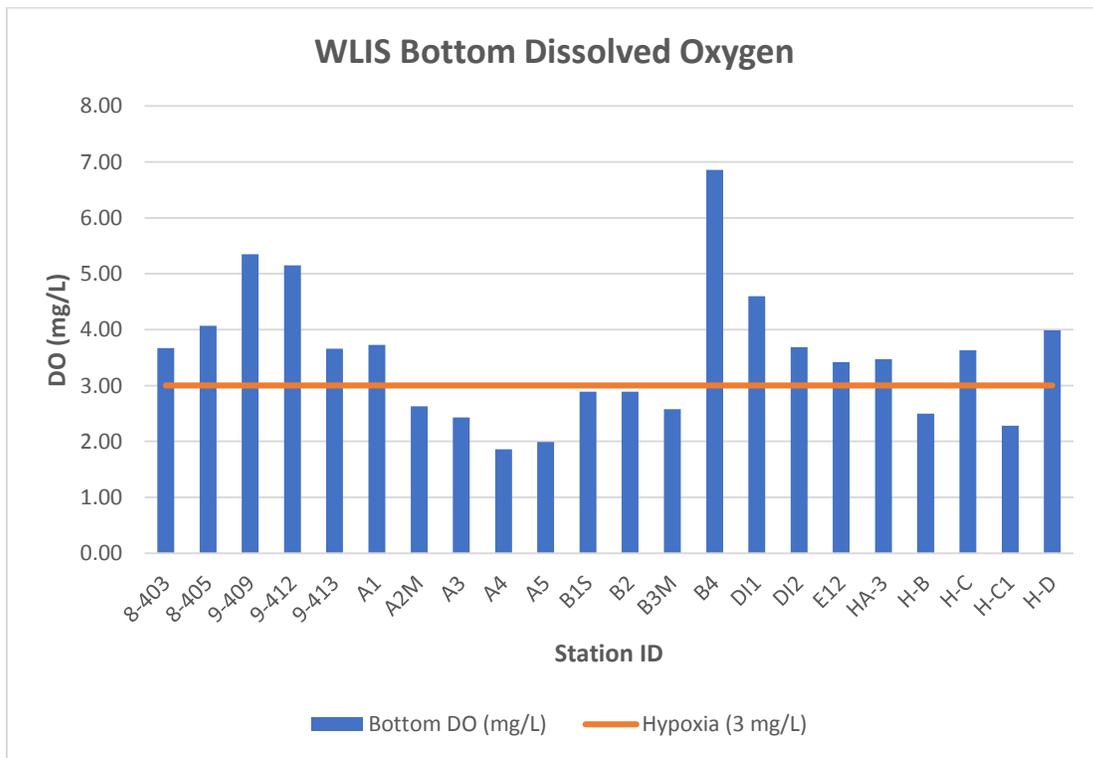
Hypoxia (DO <3.00 mg/L)	Ten sites exhibited hypoxic conditions. (See Note A)
Lowest Surface DO concentration	2.19 mg/L (Station 9-413)
Lowest bottom DO concentration	1.86 mg/L (Station A4)
Average surface DO concentration	6.17 mg/L
Average bottom DO concentration	3.52 mg/L

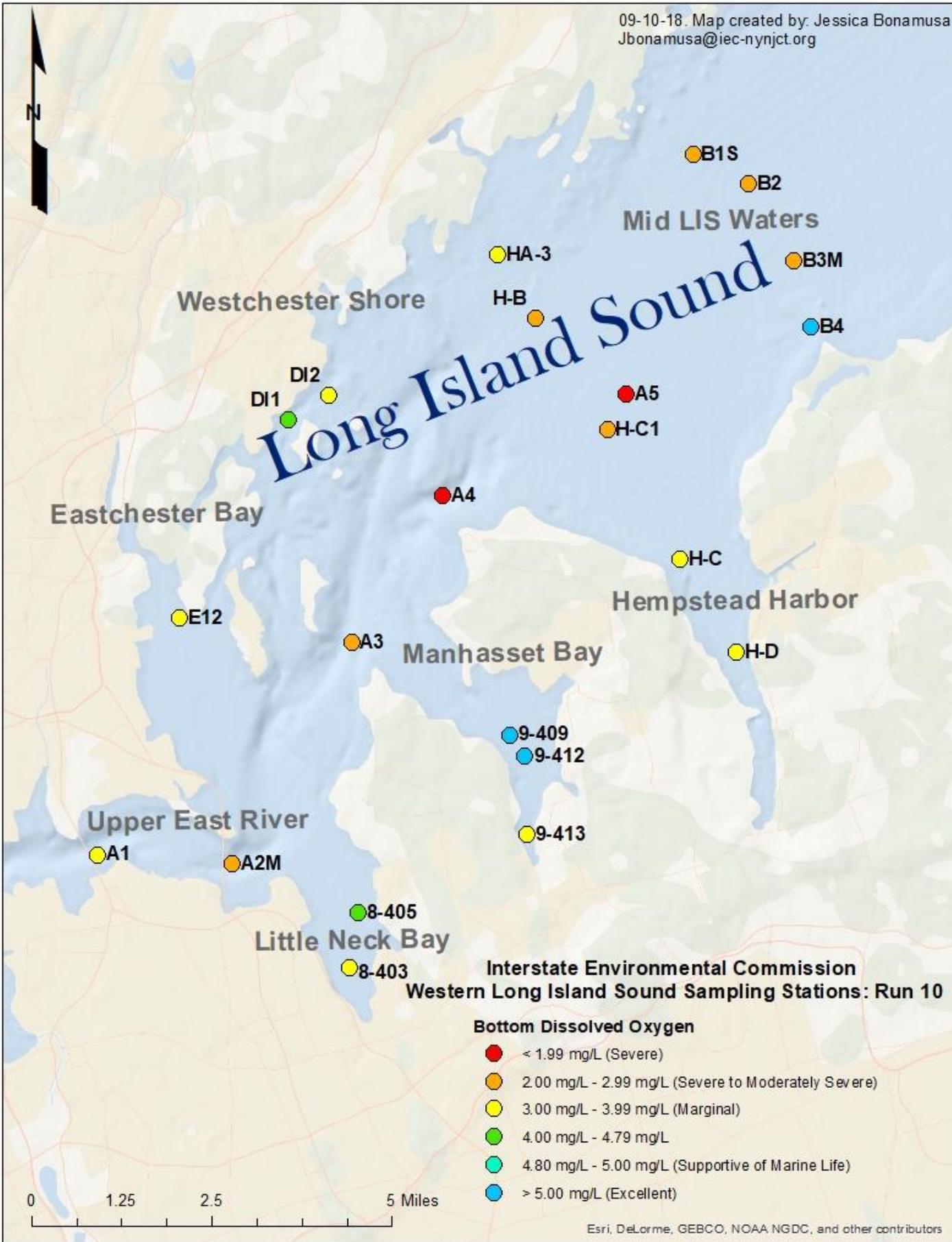
Average surface water temperature	24.56 °C
Average bottom water temperature	23.93 °C
Average water column ΔT	0.57 °C
Average surface salinity	26.38 ppt
Average bottom salinity	27.14 ppt

****NOTE A**** Nine sites (A2M, A3, A4, A5, B1S, B2, B3M, H-B, H-C1) exhibited hypoxia at bottom depth. One site (9-413) exhibited hypoxia at the surface only.

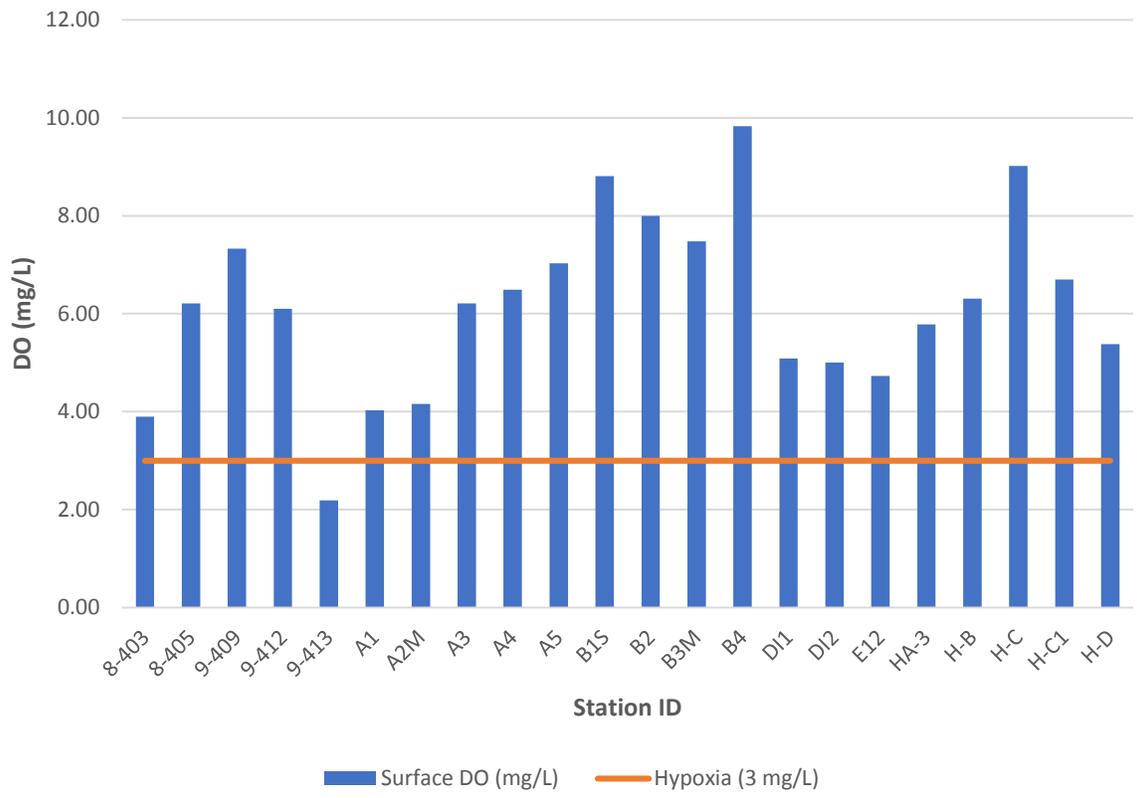
Atmospheric temperatures during the time of the survey ranged between 23.89°C and 35°C. The weather conditions were sunny. The survey started at 06:05 and ended at 09:32, with low tide at 06:47 and high tide at 00:30 as per the NOAA tide table at New Rochelle.

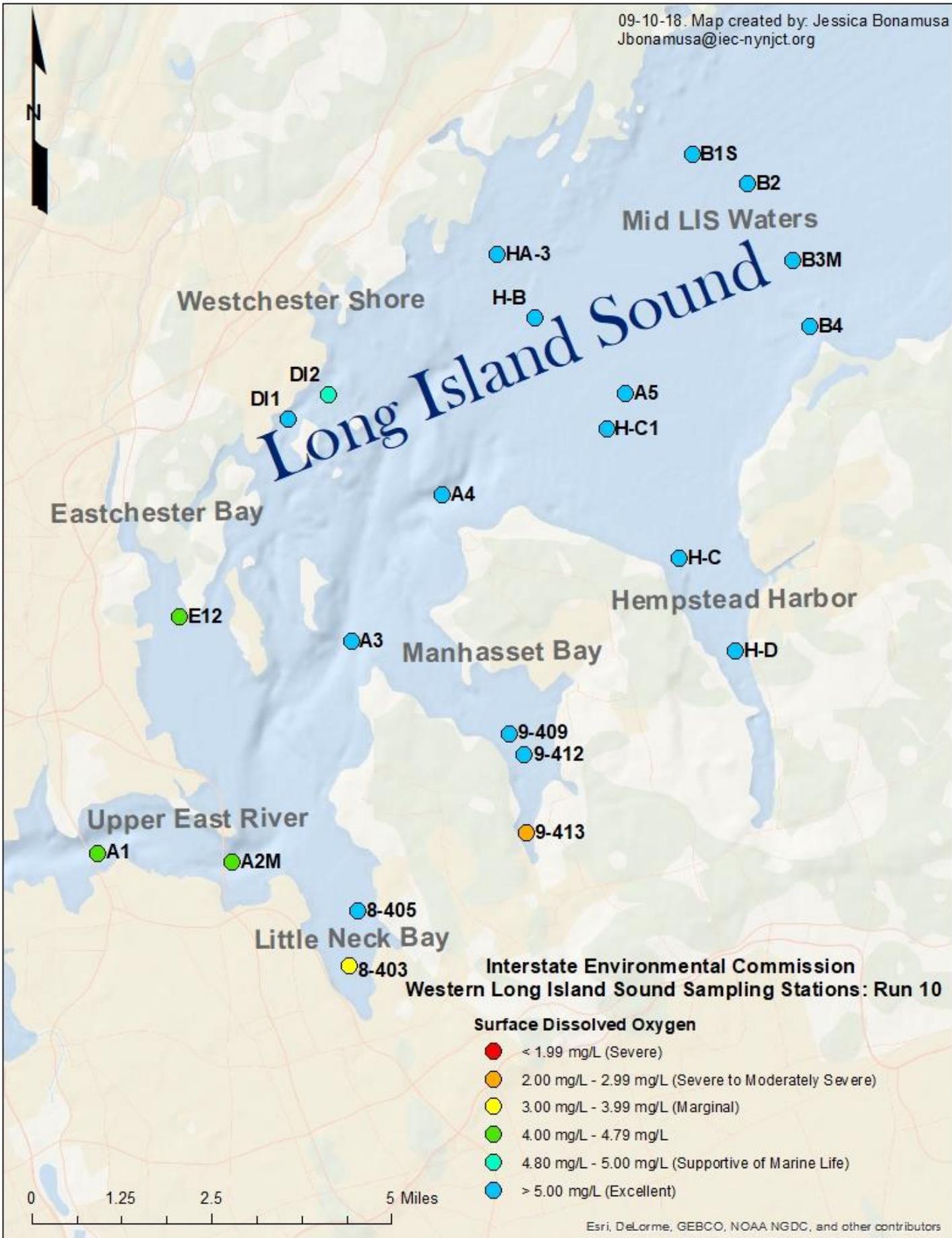
Marine organisms need oxygen to live, and low concentrations can have serious consequences for a marine ecosystem. Hypoxia occurs when dissolved oxygen (“DO”) concentrations become low. The Long Island Sound Study defines hypoxia as DO values which are below a concentration of 3.00 mg/L (EPA, 2000).





WLIS Surface Dissolved Oxygen





**Interstate Environmental Commission
Western Long Island Sound Sampling Stations: Run 10**

Surface 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

TSS AND BOD RESULTS FOR
SURFACE SAMPLES
COLLECTED 08/28/2018

Station ID	TSS (mg/L)
9-413	9.32
9-412	13.4
9-409	8.96
A3	5.52
8-405	5.60
8-403	6.96
A2M	7.68
A1	6.80
E-12	6.06
DI-1	5.38
DI-2	9.06
H-A3	7.32
H-B	6.52
B1S	5.80
B2	12.6
B3M	10.3
B4	11.2
H-D	7.48
H-C	12.5
H-C1	5.96
A5	7.98
A4	11.9
H-C1 dup	6.52

Station ID	BOD (mg/L)
9-412	<3.0
8-403	3.63
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
DI-2 dup	<3.0

SECCHI DISK DEPTH

Secchi disk measurements ranged from 2.0 feet to 6.5 feet. The deepest reading was taken at station A1. The shallowest reading was taken at station 9-413.

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.

September 2018

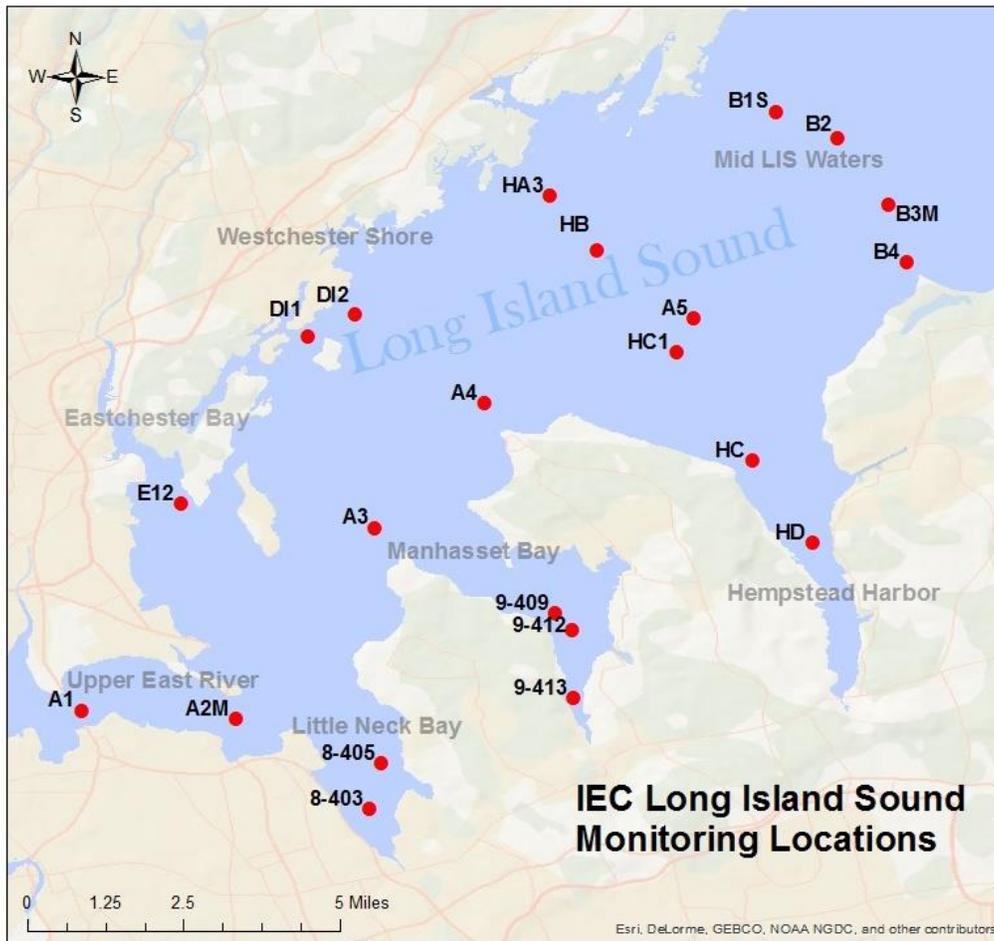
Ambient Water Quality Monitoring in the Western Long Island Sound

SURVEY 11: 9/4/2018

INVESTIGATION NUMBER: 17834



Interstate
Environmental
Commission
NY · NJ · CT



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
D11	40.8883	-73.7748
D12	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

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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	<i>In situ</i>
7/3/18	Long Island Sound 2 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
7/10/18	Long Island Sound 3	<i>In situ</i>
7/17/18	Long Island Sound 4 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
7/24/18	Long Island Sound 5	<i>In situ</i>
7/31/18	Long Island Sound 6 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
8/7/18	Long Island Sound 7	<i>In situ</i>
8/14/18	Long Island Sound 8 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
8/21/18	Long Island Sound 9	<i>In situ</i>
8/28/18	Long Island Sound 10 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
9/4/18	Long Island Sound 11	<i>In situ</i>
9/11/18	Long Island Sound 12 and Nutrients	<i>In situ</i> , 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 # 11 AT A GLANCE

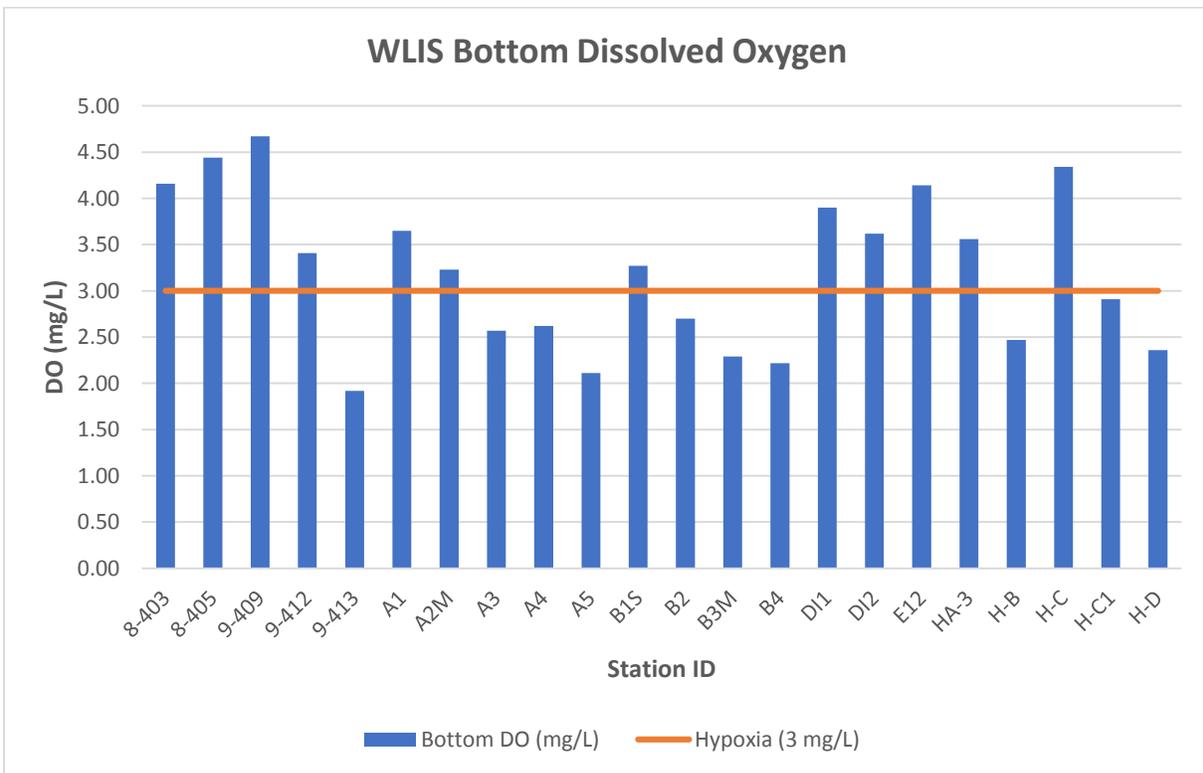
Hypoxia (DO <3.00 mg/L)	10 sites exhibited hypoxia (See Note A)
Lowest Surface DO concentration	3.87 mg/L (station A1)
Lowest bottom DO concentration	1.92 mg/L (station 9-413)
Average surface DO concentration	6.81 mg/L
Average bottom DO concentration	3.21 mg/L

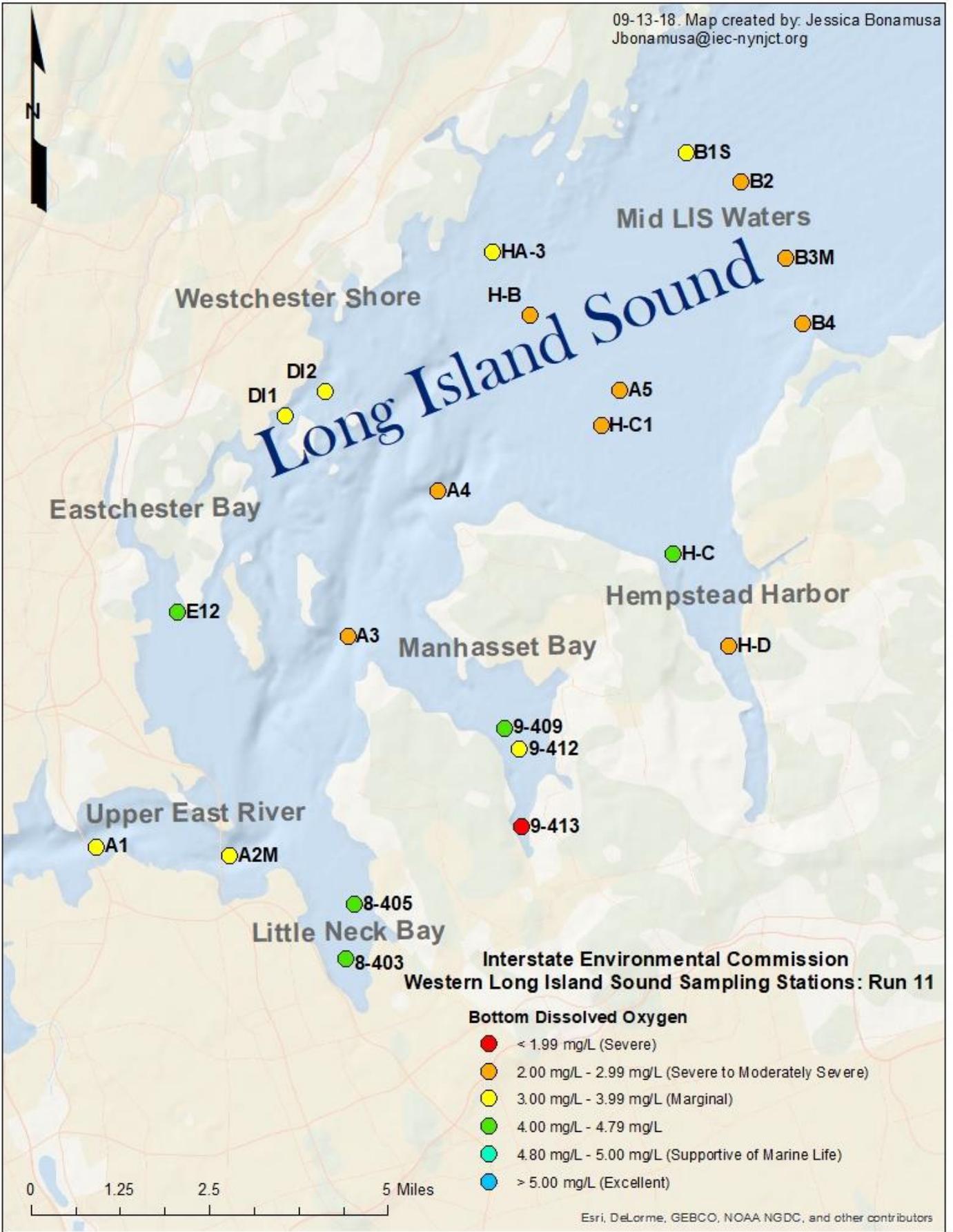
Average surface water temperature	25.22 °C
Average bottom water temperature	24.15 °C
Average water column ΔT	1.03 °C
Average surface salinity	28.03 ppt
Average bottom salinity	27.67 ppt

Ten (10) sites (9-413, A3, H-B, B2, B3M, B4, H-D, H-C1, A5, A4) exhibited hypoxic measurements at bottom depth. B3M also exhibited hypoxia at a mid-depth. No sites exhibited hypoxia at the surface.

Atmospheric temperatures during the time of the survey ranged between 78 °F and 93°F. The weather conditions were hot, humid and hazy. The survey started at 6:07 and ended at 10:27, with low tide at 12:11 and high tide at 05:56 as per the NOAA tide table 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).

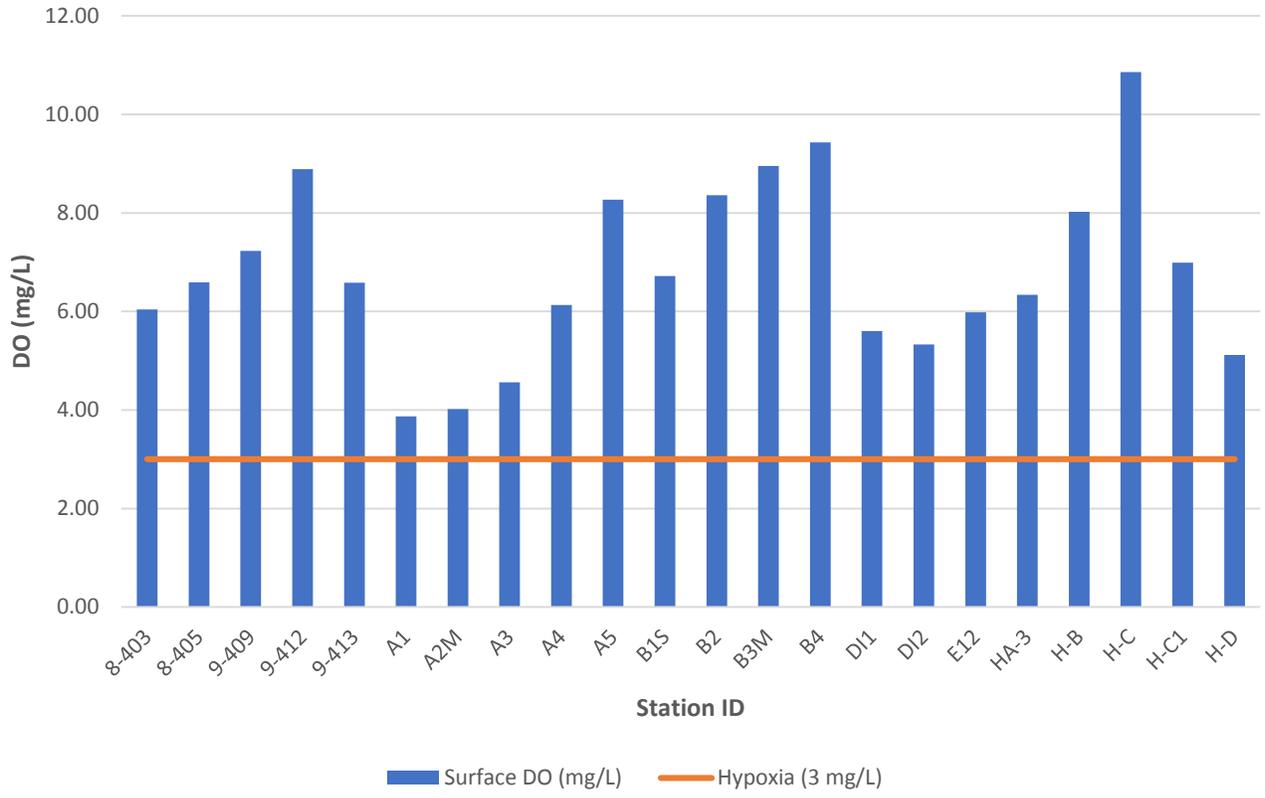


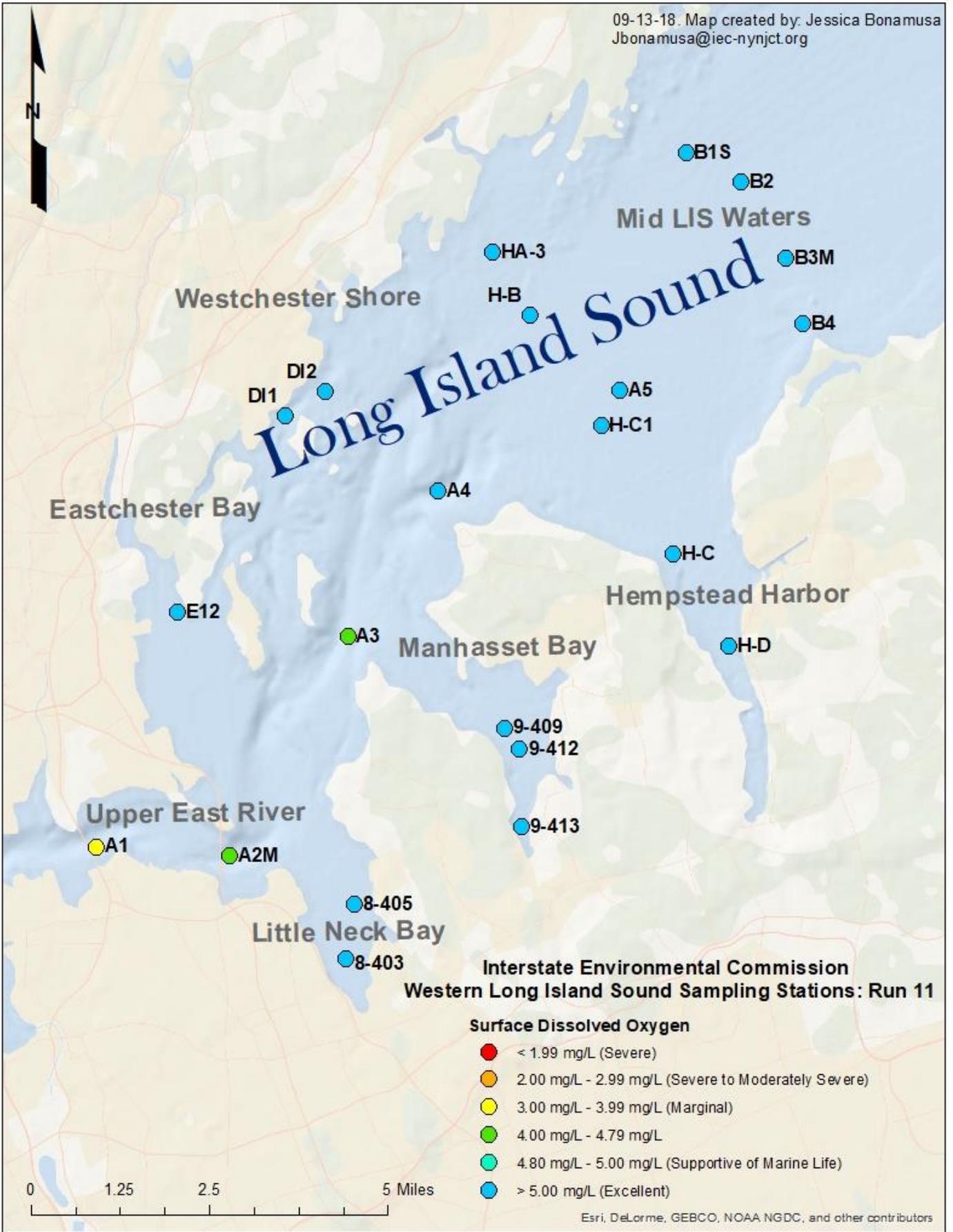


Interstate Environmental Commission
Western Long Island Sound Sampling Stations: Run 11

- 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)

WLIS Surface Dissolved Oxygen





SECCHI DISK DEPTH

Secchi disk measurements ranged from 3.0 feet to 7.0 feet. The deepest readings were taken at stations A2M and B1S. The shallowest readings were taken at station 9-413, 8-403 and HC.

CITATIONS

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September 2018

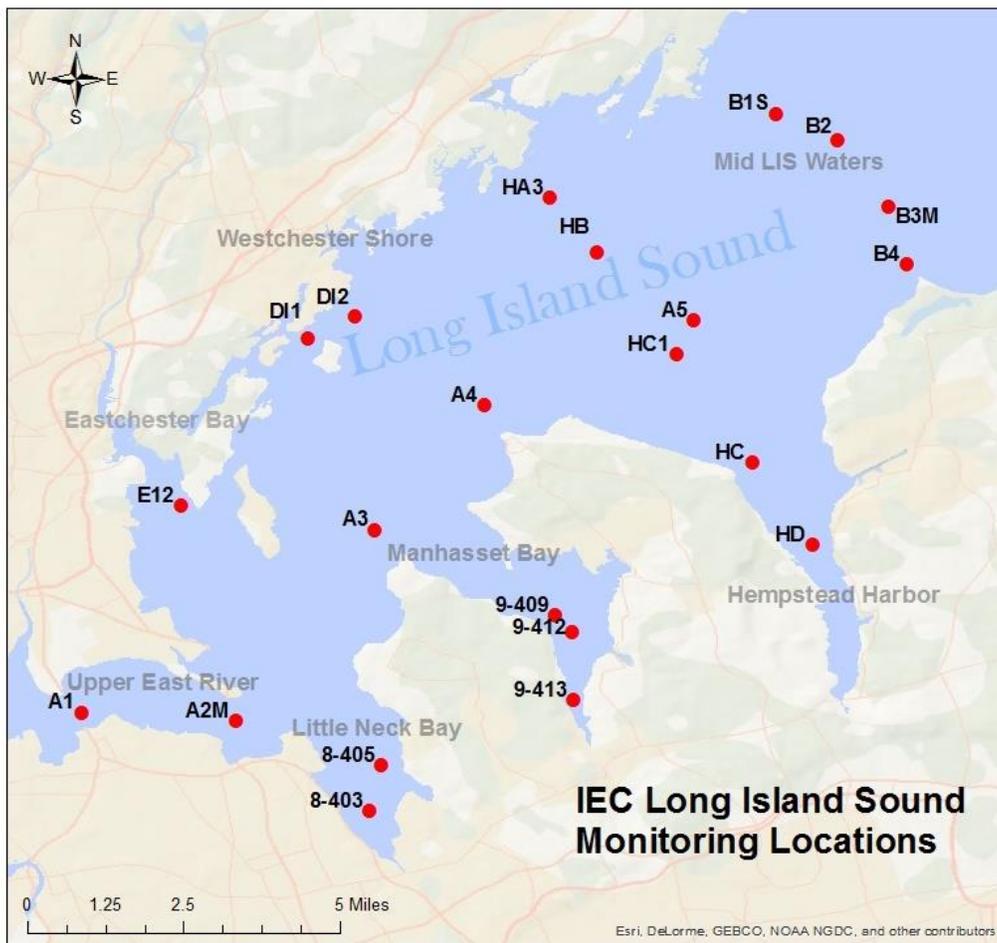
Ambient Water Quality Monitoring in the Western Long Island Sound

SURVEY 12: 9/11/2018

INVESTIGATION NUMBER: 17837



Interstate
Environmental
Commission
NY · NJ · CT



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
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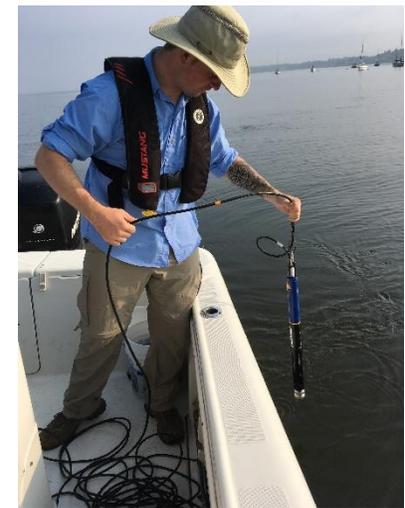
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7/24/18	Long Island Sound 5	<i>In situ</i>
7/31/18	Long Island Sound 6 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
8/7/18	Long Island Sound 7	<i>In situ</i>
8/14/18	Long Island Sound 8 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
8/21/18	Long Island Sound 9	<i>In situ</i>
8/28/18	Long Island Sound 10 and Nutrients	<i>In situ</i> , nutrients, chlorophyll a, BOD, TSS
9/4/18	Long Island Sound 11	<i>In situ</i>
9/11/18	Long Island Sound 12 and Nutrients	<i>In situ</i> , 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 # 12 AT A GLANCE

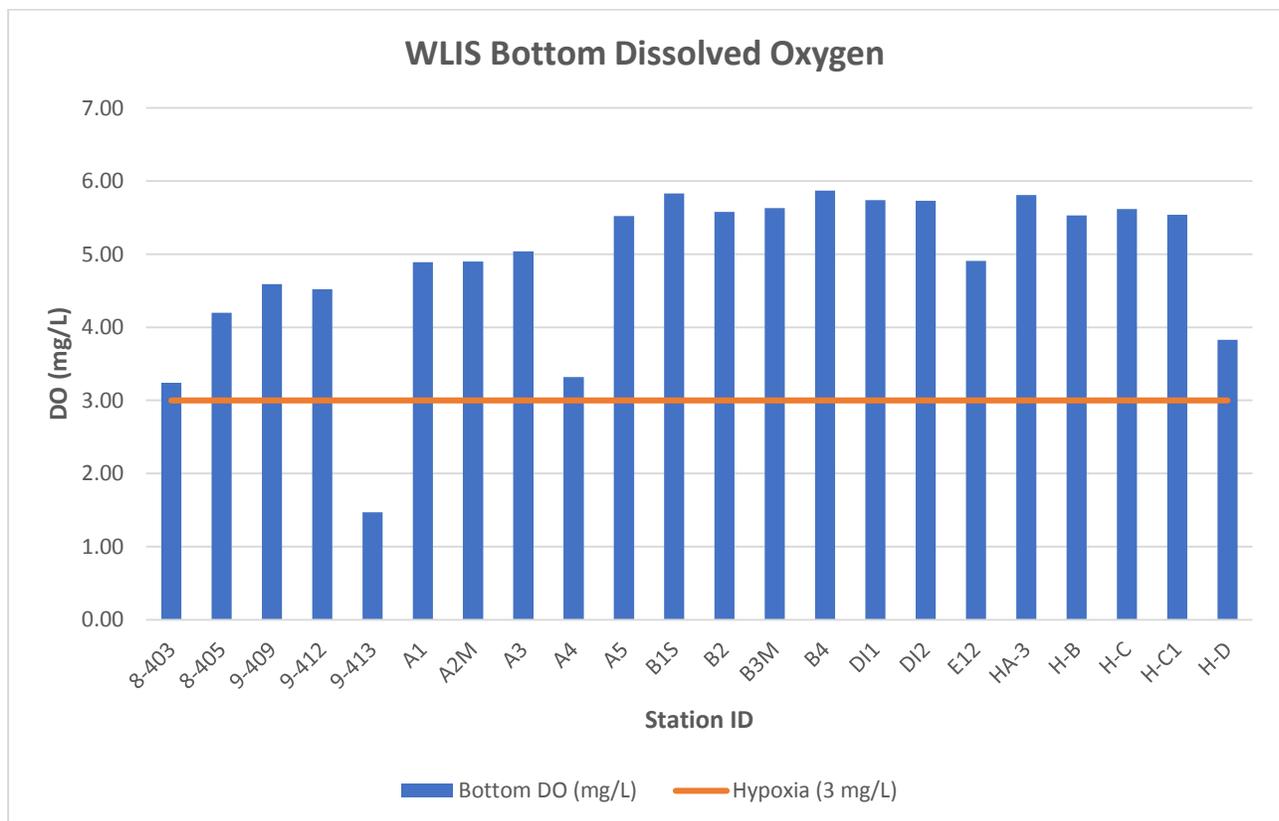
Hypoxia (DO <3.00 mg/L)	1.47 mg/L at Station 9-413 (Bottom 0.78m)
Lowest Surface DO concentration	4.01 mg/L
Lowest bottom DO concentration	1.47 mg/L
Average surface DO concentration	5.36 mg/L
Average bottom DO concentration	4.87 mg/L

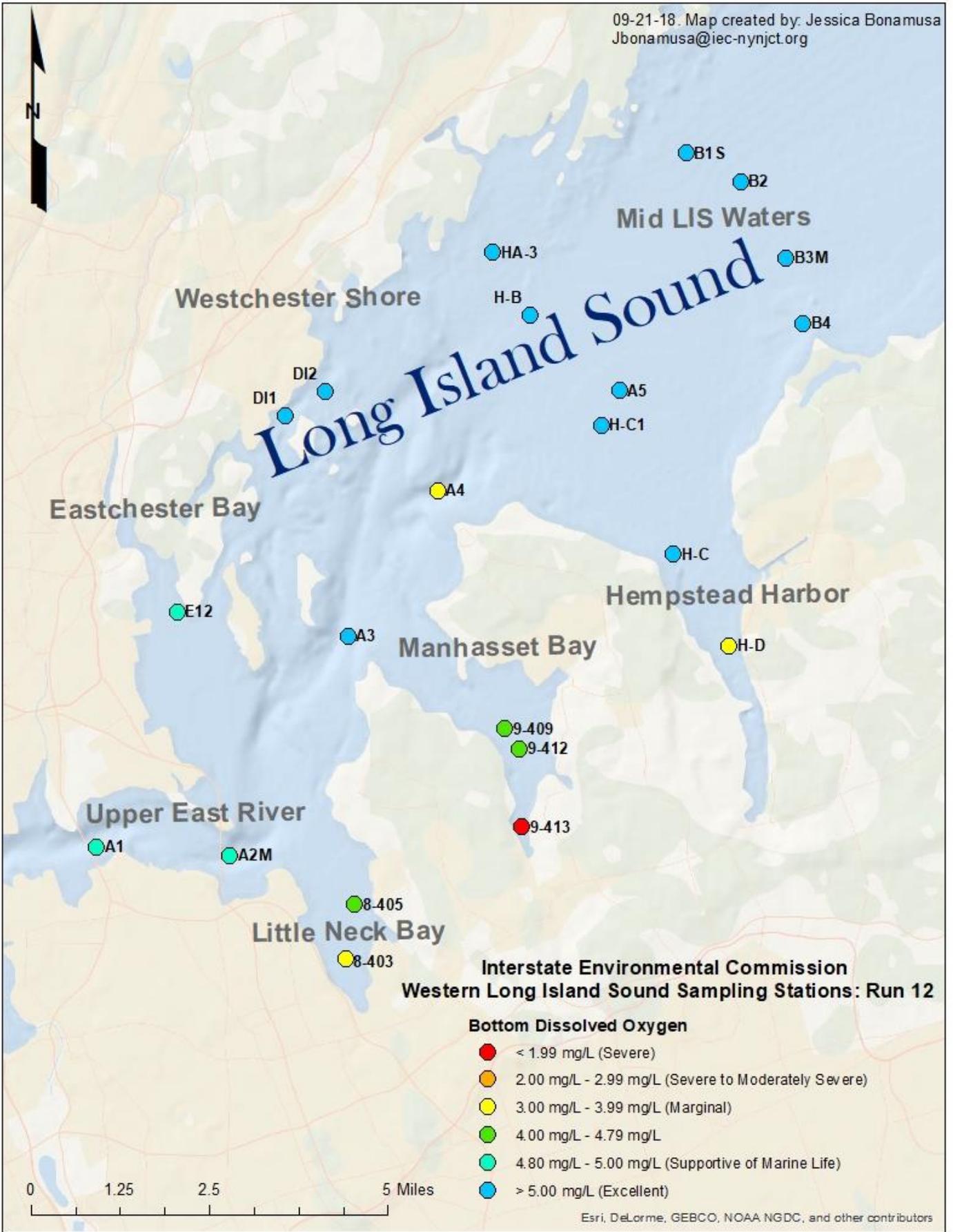
Average surface water temperature	22.03°C
Average bottom water temperature	22.0°C
Average water column ΔT	0.33°C
Average surface salinity	25.94 ppt
Average bottom salinity	26.04 ppt

One site (9-413) exhibited hypoxia, at bottom depth.

Atmospheric temperatures during the time of the survey ranged between 72°F and 78°F. The weather conditions were overcast, with early fog. There was no precipitation during the survey, there was 2.0" of precipitation in the 24 hour period prior to sampling, as recorded at LaGuardia Airport. The survey started at 06:33 and ended at 10:23, with low tide at 07:19 and high tide at 12:39 as per the NOAA tide table at New Rochelle.

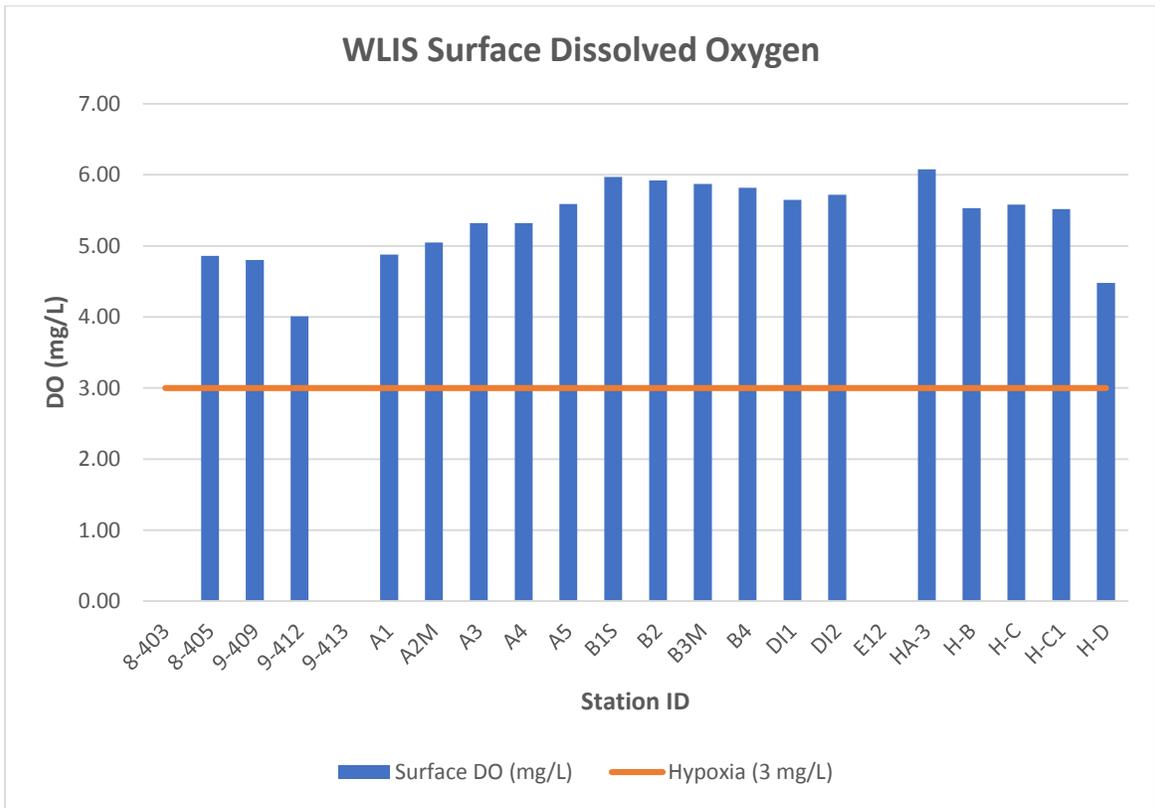
Marine organisms need oxygen to live, and low concentrations can have serious consequences for a marine ecosystem. Hypoxia occurs when dissolved oxygen ("DO") concentrations become low. The Long Island Sound Study defines hypoxia as DO values which are below a concentration of 3.00 mg/L (EPA, 2000).



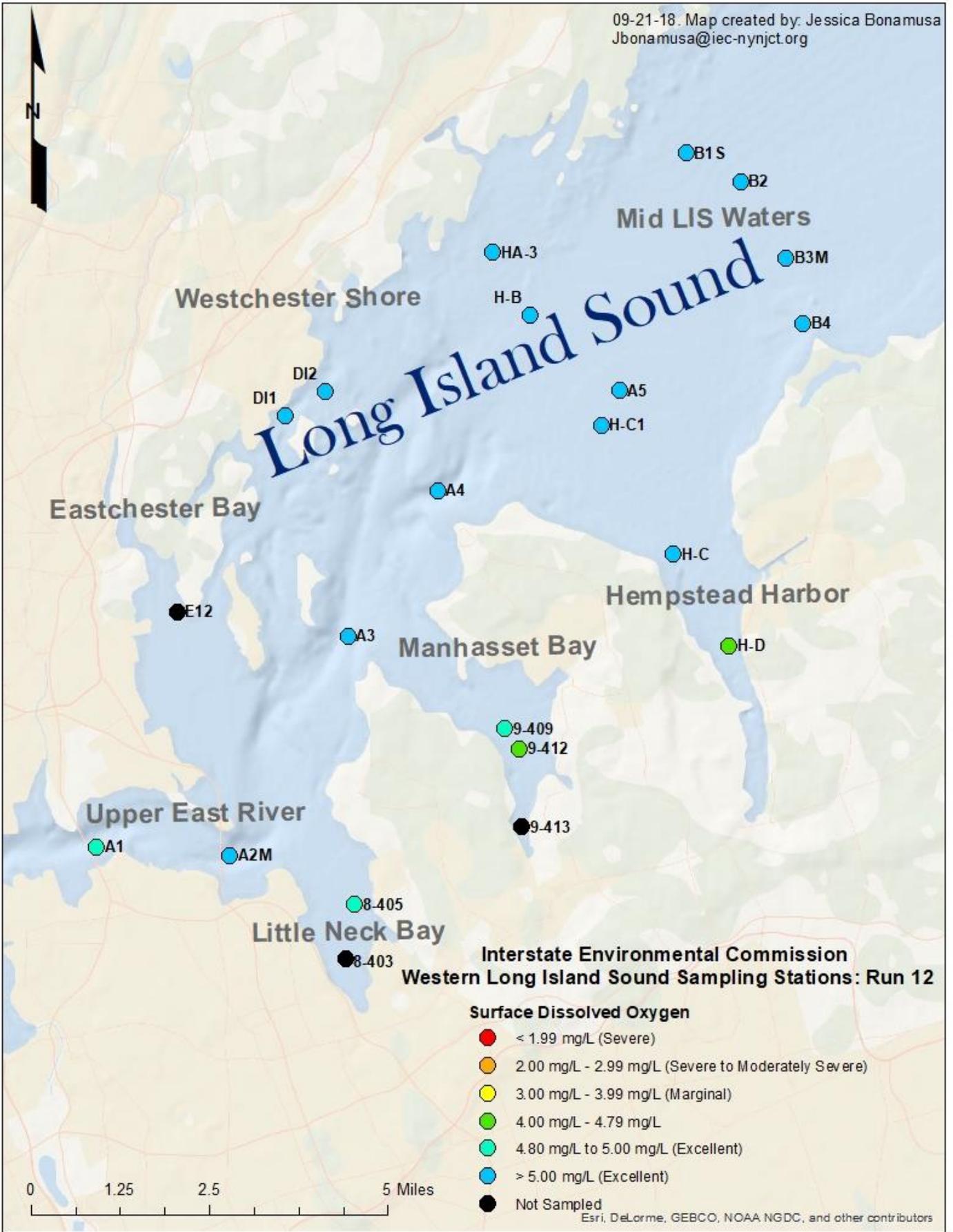


N

DI1 DI2
HA-3 H-B
A5 H-C1
A4
A3
A1 A2M
8-405 8-403
9-409 9-412 9-413
H-C H-D
B1S B2 B3M B4



Note: Only bottom DO was measured at stations 8-403, 9-413, and E12 due to shallow depth.



**Interstate Environmental Commission
Western Long Island Sound Sampling Stations: Run 12**

SECCHI DISK DEPTH

Secchi disk measurements ranged from 2.0 feet to 6.0 feet. The deepest reading was taken at stations B2. The shallowest reading was taken at station 9-413.

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.