



AUGUST

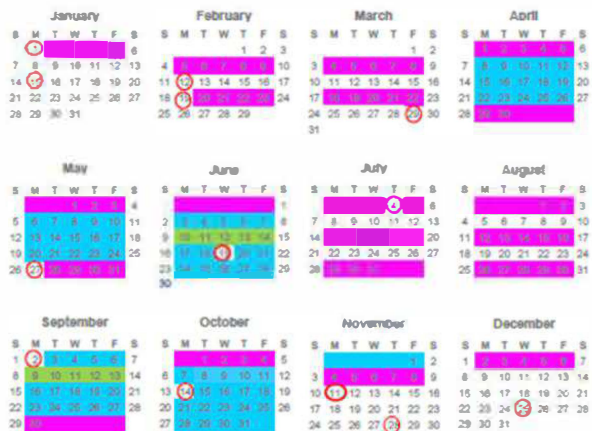
LONG ISLAND SOUND WATER QUALITY MONITORING PROGRAM

The 2024 Long Island Sound Sampling began on Jan 2nd, 2024 with all cruises being completed as scheduled so far. The WQAUG24 survey started on July 29, 2024 and finished on August 1, 2024. The Water Quality and Hypoxia surveys conducted by CT DEEP are critical for assessing the health and ecological integrity of Long Island Sound. These surveys monitor key water quality indicators, such as dissolved oxygen, temperature, salinity, nutrients, and phytoplankton, to evaluate the overall condition of the estuary. Hypoxia, or low oxygen levels, poses significant threats to marine life and can lead to ecosystem disruptions. By regularly collecting and analyzing data, CT DEEP can track trends, identify potential problem areas, and inform management strategies aimed at mitigating hypoxia and improving water quality. Visit our [website](#) for more information.



2024 Sampling Schedule

LONG ISLAND SOUND MONITORING CALENDAR 2024

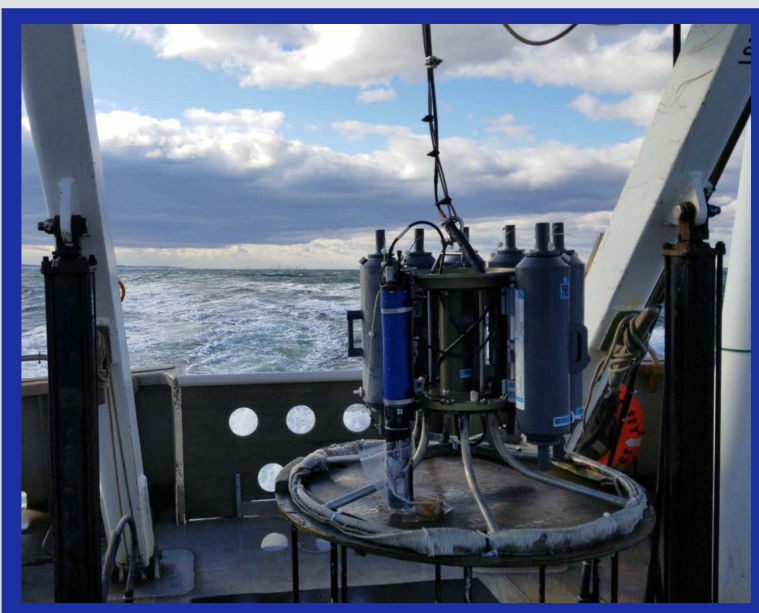
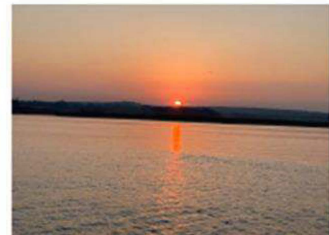


- Ambient WQ Monitoring
- Trawl Survey
- Water and Trawl
- State Holiday

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WaterQuality@ct.gov



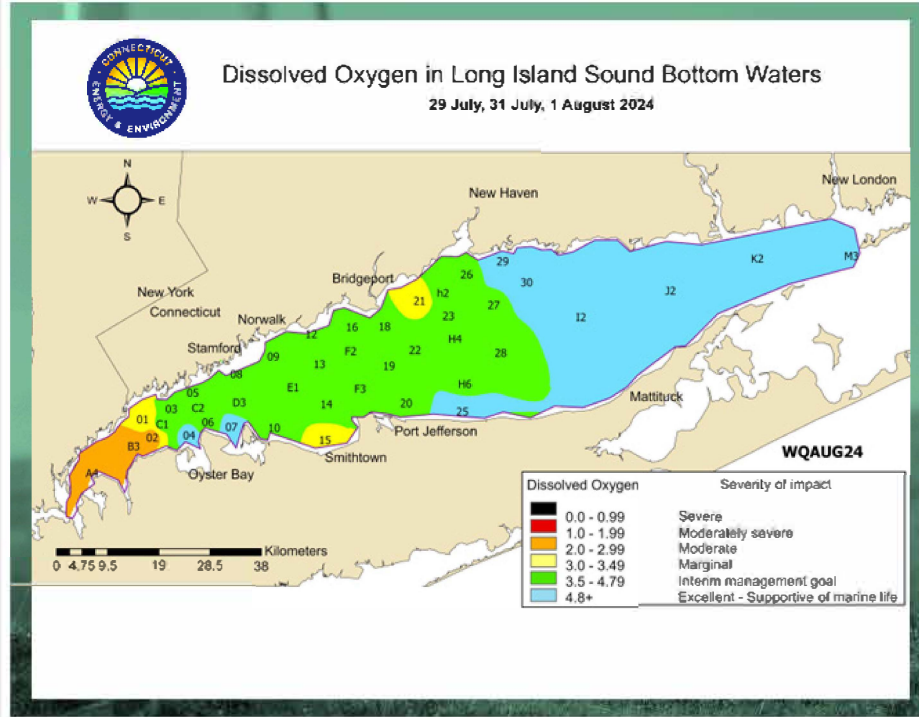
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CT DEEP sampled 42 stations during the WQAUG24 survey that was conducted from 29 July- 1 August 2024. Dissolved oxygen (DO) concentrations in the bottom waters of Long Island Sound during the WQAUG24 ranged from 2.25 - 7.14 mg/L. Three stations were below 3.0 mg/L, three stations were below 3.5 mg/L and an additional 27 stations fell below 4.8 mg/L. The lowest concentration measured during the survey was at Station A4 and the highest was 6.42 mg/L measured at Station M3. These are lower DO levels than recorded in the HYJUL23 cruise.

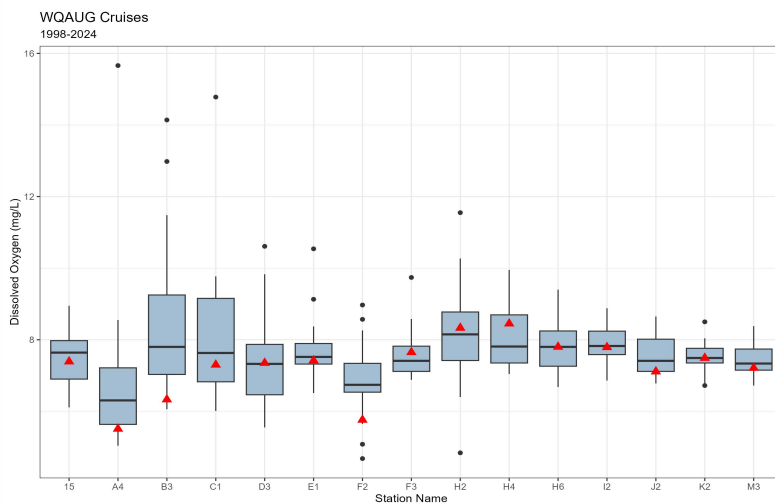
Of the 27 bottom waters measurements recorded in August at Station A4 between 1998 and 2024, the median concentration was 1.69 mg/L with a range of 0.32 to 4.62 mg/L. The mean was 1.97 mg/L.

During the WQAUG24 Survey there were 112.4 km² (43.4 mi²) of bottom water with DO less than 3.0 mg/L, 110.6 km² (42.7 mi²) with DO between 3.0 and 3.5 mg/L, and 1221.7 km² (471.7 mi²) with concentrations between 3.5 and 4.8 mg/L. These areas are very similar to 2023.



Preliminary data from this survey and prior 2024 cruises are available on the [Water Quality Portal](#) and on the [UCONN ERDDAP site](#).

Surface Dissolved Oxygen Concentrations Across Long Island Sound



Bottom Dissolved Oxygen Concentrations Across Long Island Sound

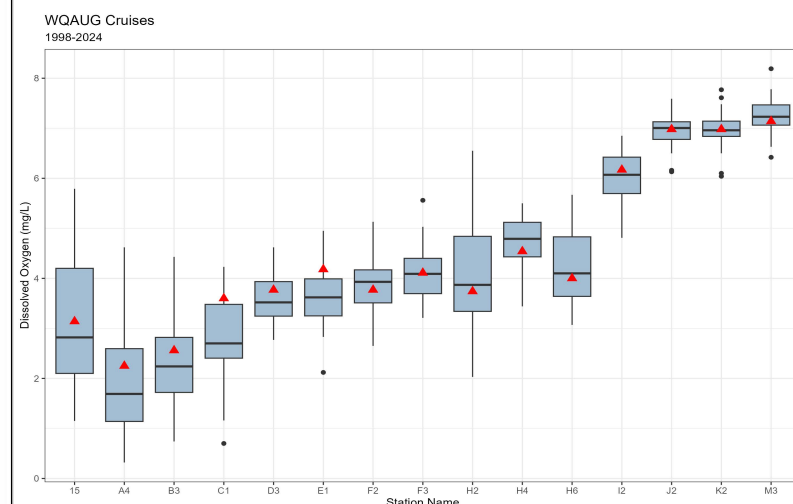
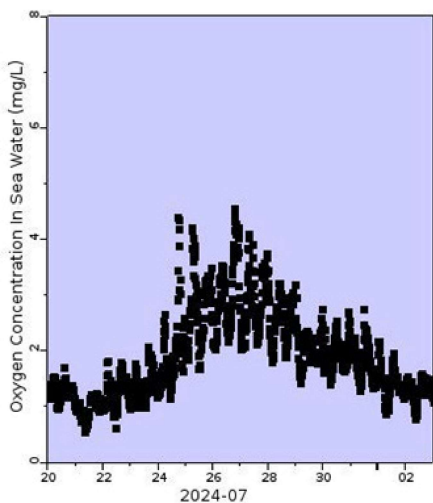
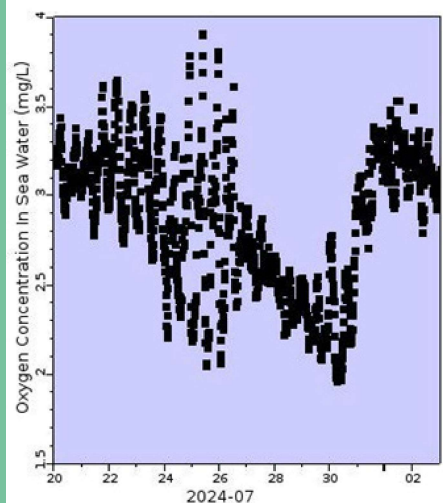


Table 1: Minimum Dissolved Oxygen Concentrations and Areal Estimates for WQAUG Cruises Conducted from 1998- 2024 by CT DEEP

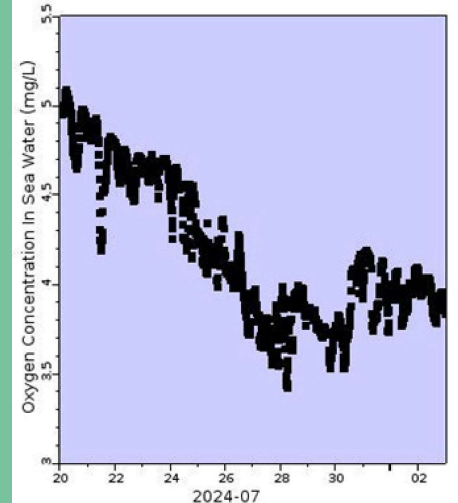
Cruise	Minimum DO Observed (mg/L)	Station with Minimum DO	Area under 4.8 mg/L (km ²)	Area under 3 mg/L (km ²)
WQAUG98	0.33	A4	1188.6	312.5
WQAUG99	0.8	A4	1458.6	311.5
WQAUG00	3.13	06	1183.2	0
WQAUG01	2.23	A4	1532.3	165.8
WQAUG02	0.56	02	1303.5	324.7
WQAUG03	1.91	B3	1733	275.1
WQAUG04	2.67	A4	1213.3	53.1
WQAUG05	0.6	A4	1338.7	459.5
WQAUG06	0.63	A4	1597.7	515.4
WQAUG07	1.59	A4	1480.4	418.9
WQAUG08	0.61	A4	1530.5	235.9
WQAUG09	1.49	A4	1177.1	113.2
WQAUG10	1.17	02	1210.5	261.8
WQAUG11	1.65	A4	1049.7	165.5
WQAUG12	2.35	02	1615	121.1
WQAUG13	2.28	A4	1066.7	41.3
WQAUG14	1.67	B3	980.5	225.6
WQAUG15	2.77	A4	552.4	90.1
WQAUG16	3.37	F3	890.2	0
WQAUG17	3.37	F3	1232	0
WQAUG18	2.58	A4	1080.3	53.5
WQAUG19	1.29	A4	1218.8	231.6
WQAUG20	1.77	A4	1470.3	164.2
WQAUG21	0.99	A4	1389.1	206.1
WQAUG22	1.43	A4	1098.4	224.4
WQAUG23	1.69	A4	1538.3	328.4
WQAUG24	2.25	A4	1444.7	112.4



■ EXRX Buoy Bottom Water Quality Data
Data courtesy of University of Connecticut



■ WLIS Buoy Bottom Water Quality Data
Data courtesy of University of Connecticut



■ ARTG Buoy Bottom Water Quality Data 1
Data courtesy of University of Connecticut

The graphs above show continuous dissolved oxygen data collected at three of the LISICOS Buoys in the Western Sound around the WQAUG24 survey. Concentrations at Execution Rocks (near CTDEEP Station A4) and the Western Buoy (CTDEEP Station C1) were generally below 3.0 mg/L, while the ArtG Buoy (near CTDEEP Station E1) was above 3.5 mg/L.

Surface water temperatures continued to rise during the WQAUG24 survey with a 0.54°C increase of average surface temperatures while bottom water temperatures rose 1.93°C from HYJUL24 to WQAUG24.

The maximum surface water temperature during the WQAUG24 survey occurred at Station 23 (25.55°C) while the maximum bottom water temperature occurred at Station 25 (22.98°C).

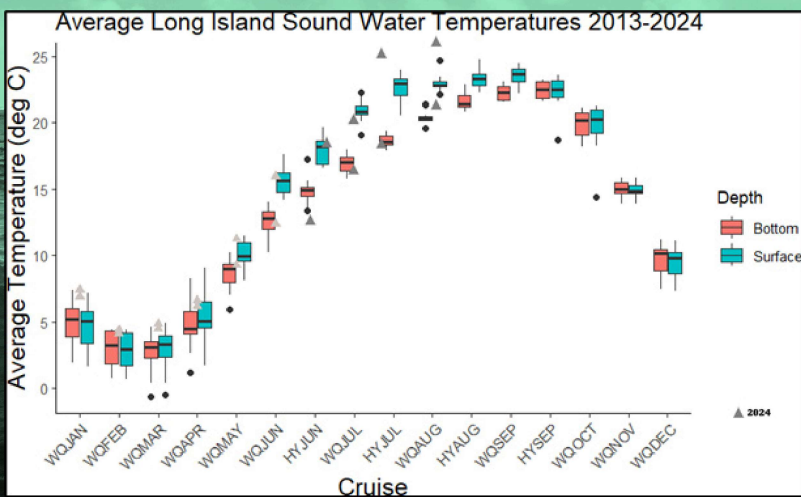
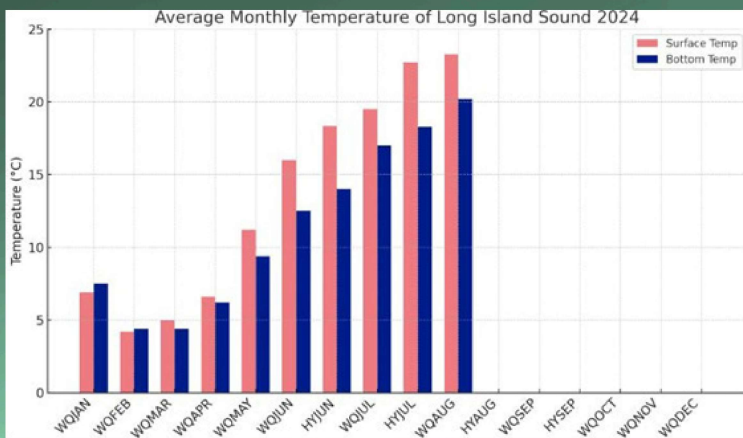
The average surface water temperature for WQAUG was lower in 2023 than in 2024 but the average bottom water temperature was higher in 2023 than 2024.

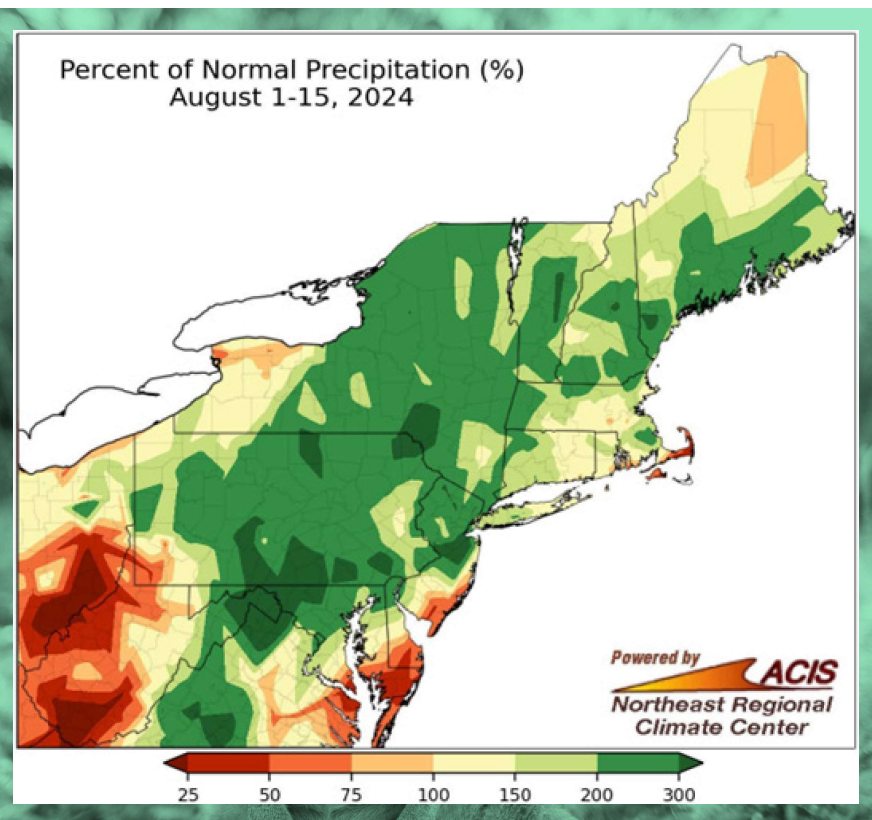
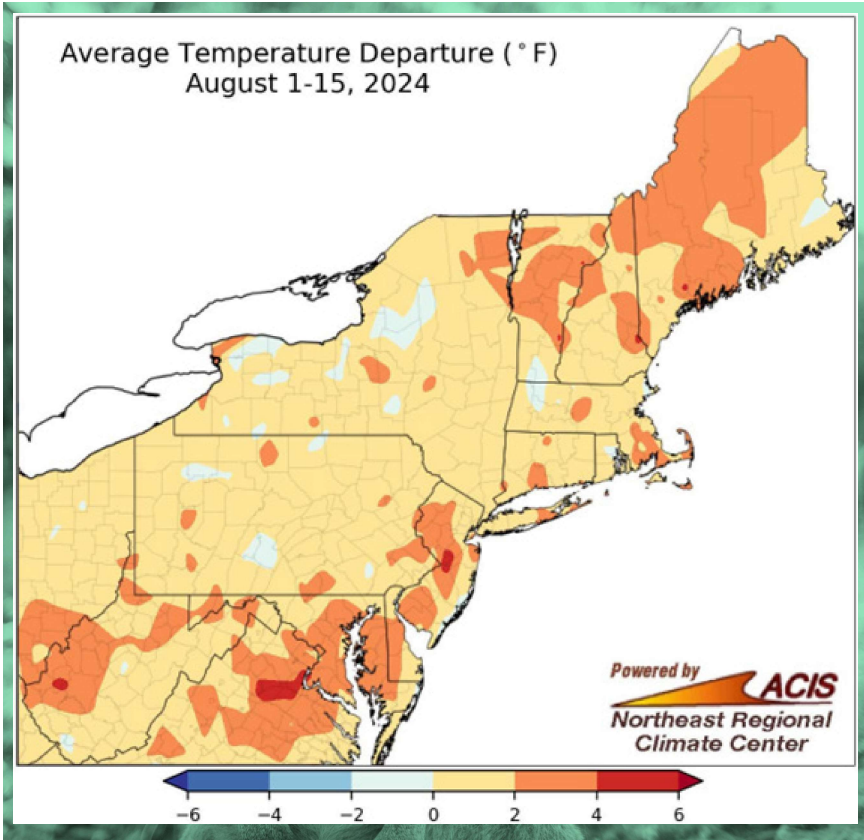
Delta T (ΔT)

The greatest temperature difference between the surface and bottom waters during the WQAUG24 survey was 5.98°C, measured at Station H6. The smallest temperature difference was 0.21°C at Station M3. ΔT 's averaged 3.08°C during the WQAUG24 survey compared to WQAUG23 ΔT 's average of 2.61°C.

Delta T (ΔT) is the difference between the surface and bottom water temperature. Differences in water temperature contribute to stratification and exacerbate hypoxic conditions. In general, the shallower coastal stations tended to have the smallest temperature differences, as they are more susceptible to mixing, weather, and anthropogenic influences (human caused Influences). The greater the delta T, the greater the potential for hypoxia to be more severe.

In June, DEEP's hypoxia monitoring cruises began. The DEEP's monitoring program records water temperatures and salinity during its hypoxia monitoring cruises to help estimate the extent of favorable conditions for the onset and ending of hypoxia. Water temperature plays a major role in the timing and severity of the summer hypoxia event. Water temperature differences in the western Sound during the summer months are particularly influential in contributing to the difference in dissolved oxygen content between surface and bottom waters.





August started off wet and warm with near or above-normal rainfall recorded the first half of the month in the Northeast. Areas in West Virginia, central Pennsylvania, northern New York, and Maine saw more than double their normal rainfall amount. Nine major climate sites ranked among the 20 wettest for the first half of August and 29 out of the 35 major climate sites were cooler than normal.

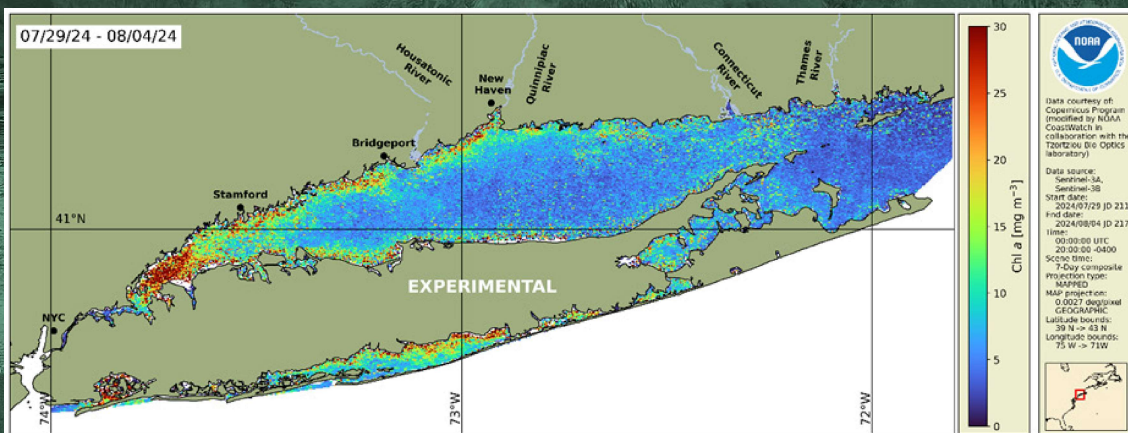
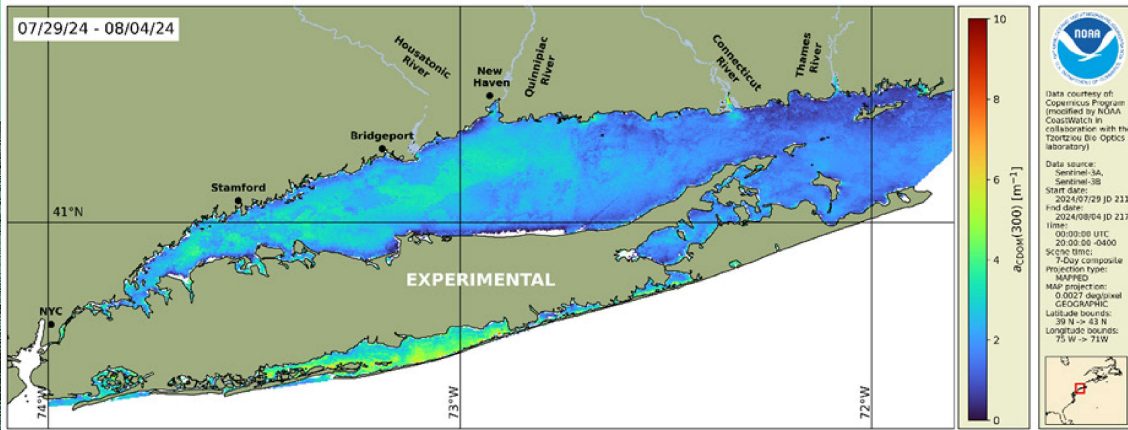
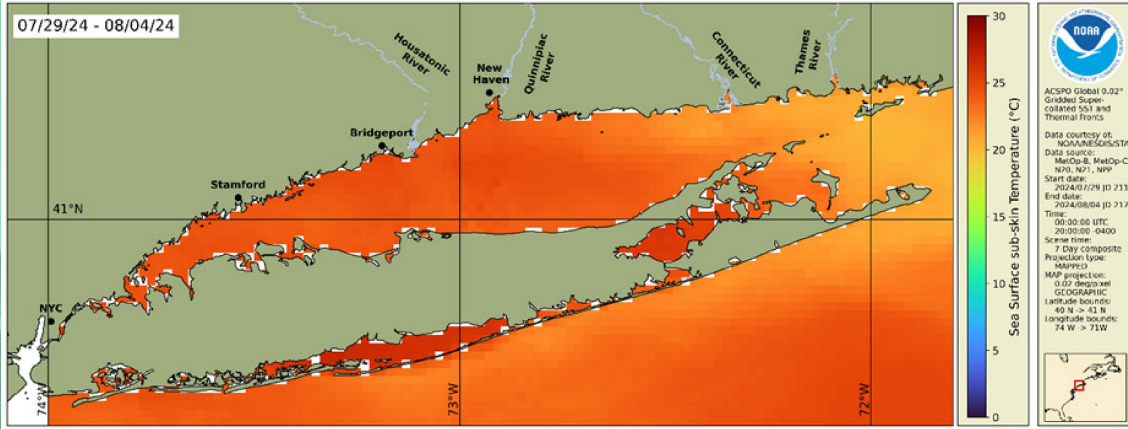
Hartford, CT had a +2.5°F departure from normal temperature of 73.6°F. The average temperature for the month of August was 76.1°F, the 19th hottest Aug 1-15 on record. Hartford also received 119% of normal precipitation at 2.65 inches versus a typical 2.22 inches.

Air temperatures in Bridgeport, CT were close to normal averaging 75.7°F with only a 0.3°F departure from a normal temperature of 75.4°F. Precipitation was 143% of normal reaching 2.81 inches compared to a normal 1.97 inches.

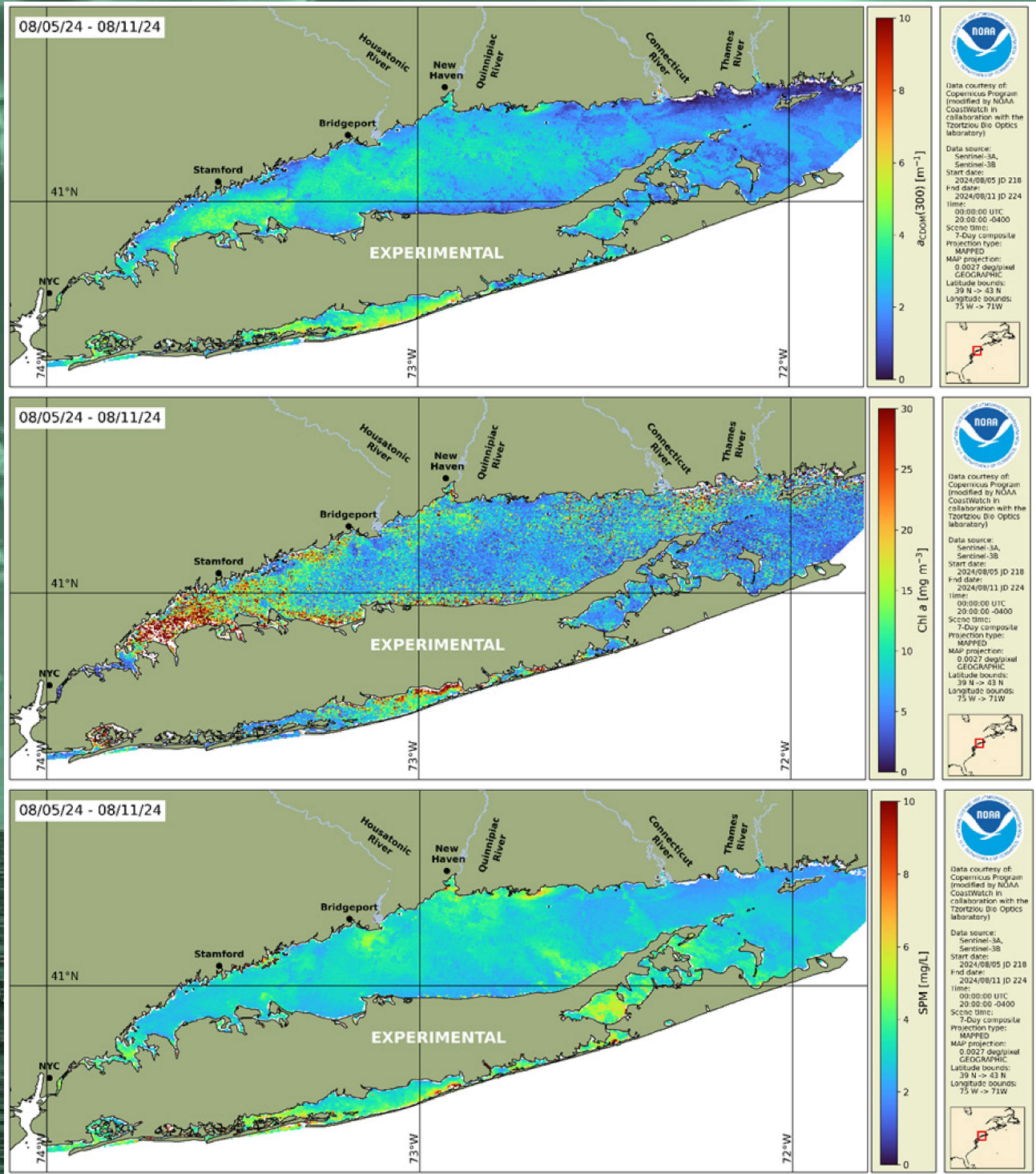
Islip, NY also had warmer temperatures than normal. There was a +1.1°F departure from a normal temperature of 74.7°F, with the average temperature in Islip, NY during this period being 75°F. For precipitation Islip, NY had 208% of normal precipitation at 4.43 inches. Normal precipitation was 2.13 inches.

All data and images were from the Northeast Regional Climate Center's website. Please visit

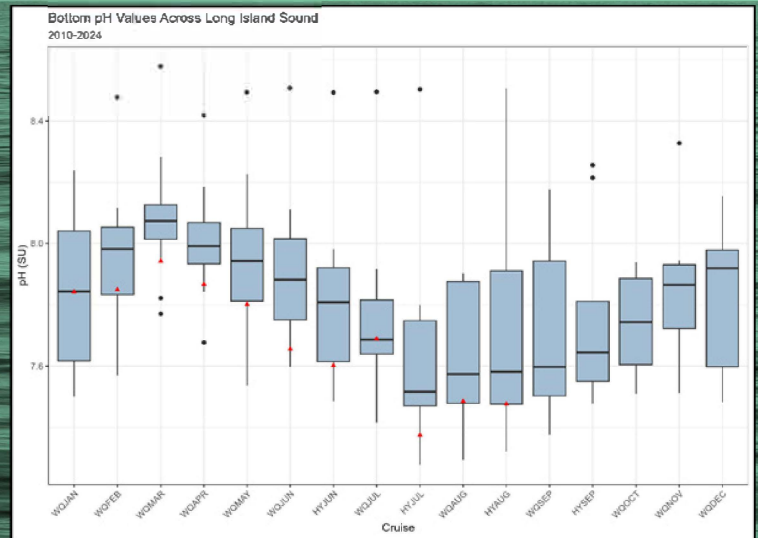
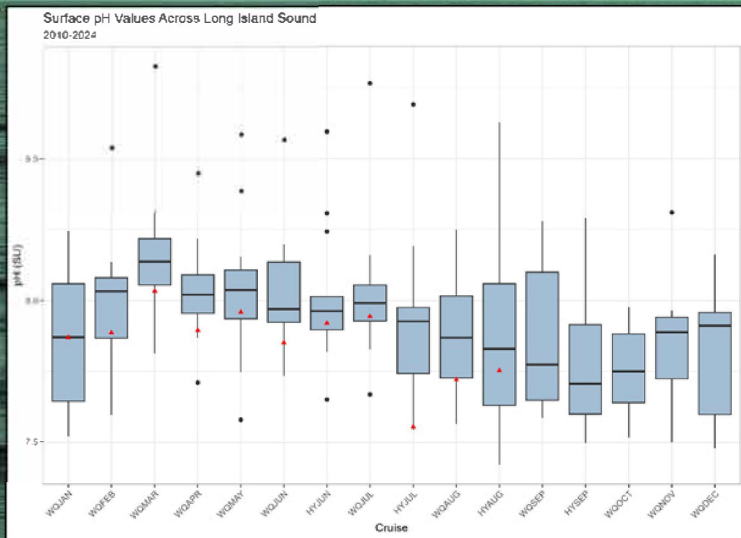
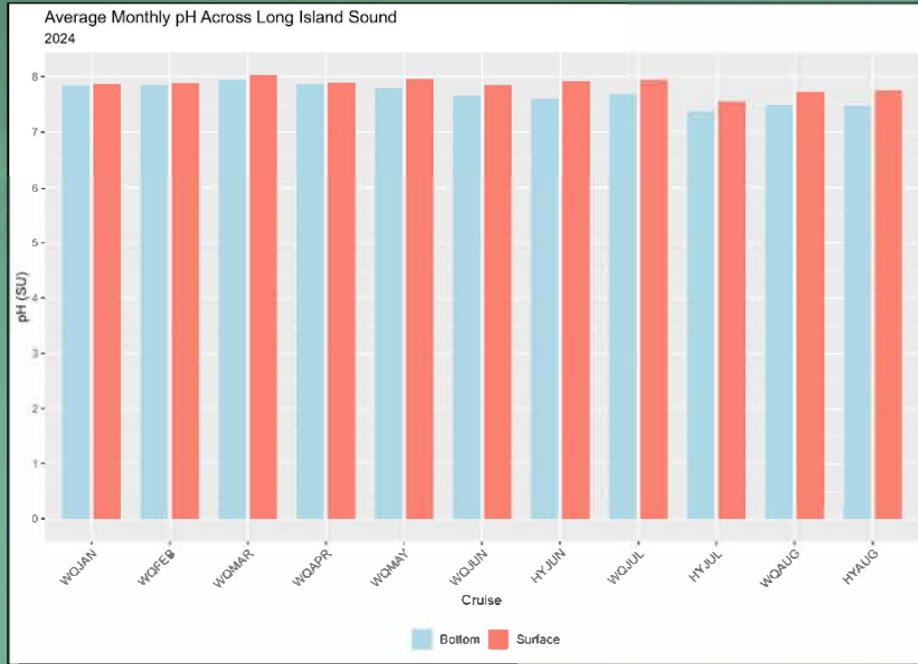
<http://www.nrcc.cornell.edu/> for more information.

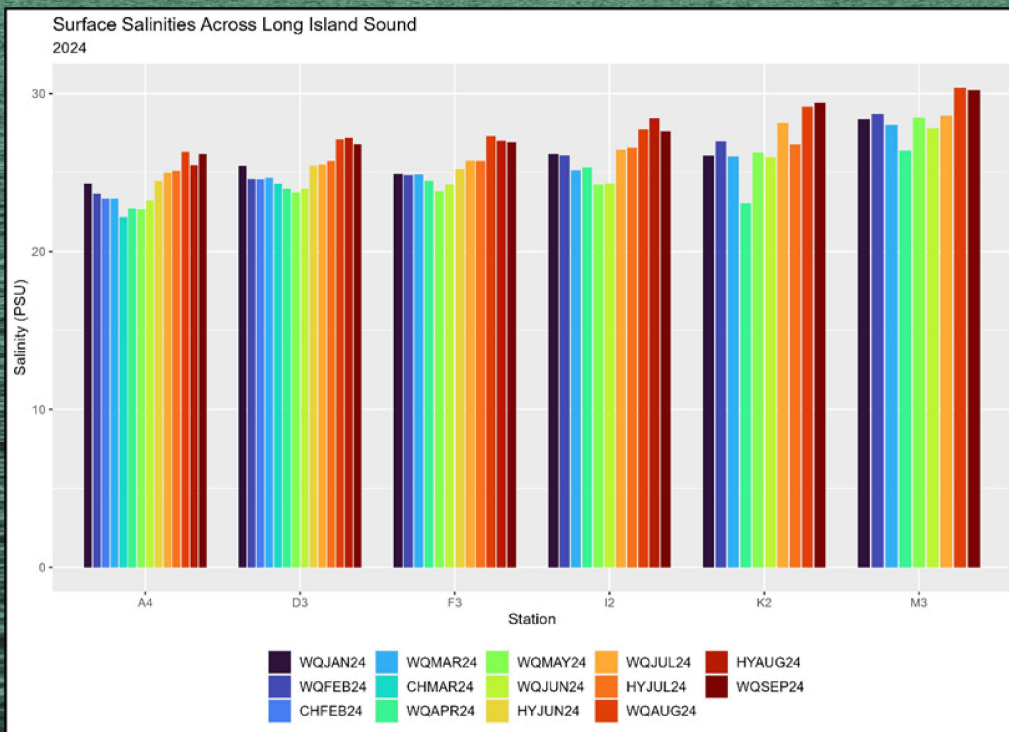
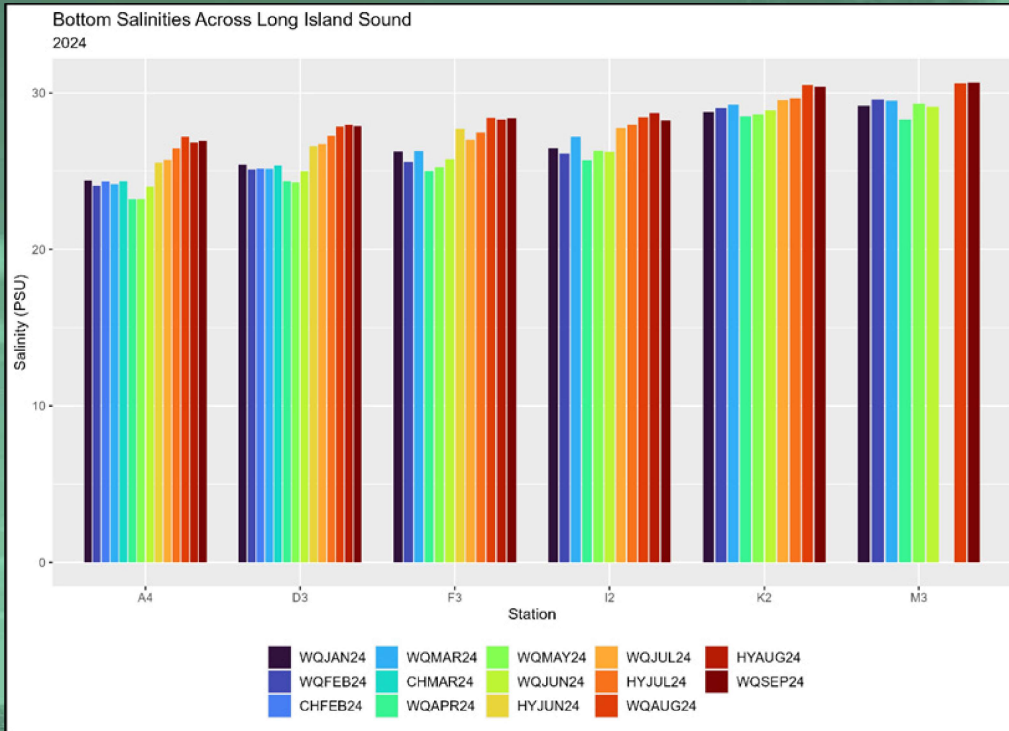


These images were acquired from NASA's OLCI satellite. Partners at NOAA and the Tzortziou Bio-optics Lab process the images for Chlorophyll a, Suspended Particulate Matter (SPM), and Colored Dissolved Organic Matter (CDOM) using an algorithm optimized for Long Island Sound. (Sea surface temperature (SST) is not optimized for LIS.)



The average surface and bottom pH from all the stations across LIS during the WQAUG24 survey were 7.74 and 7.48 SU, respectively. The lowest bottom pH was 7.25 (Station A4), the highest bottom pH was 7.75 (Station J2), the lowest surface pH was 7.43 (Station A4), and the highest surface pH was 7.98 (Station 23).





Surface salinities across Long Island Sound generally decrease slightly from January through May due to snow melt and spring rains. The less dense freshwater will float on top of the denser saltwater contributing to stratification and impacting hypoxia. Additionally, nutrients carried by runoff fuel phytoplankton growth.

Surface and bottom water salinities in 2024 followed this pattern.

The table to the bottom left examines three stations across the Sound from west to east, showing the influence of the East River on Station A4 and the Atlantic Ocean on M3. Surface and bottom salinity values at these stations during the WQAUG24 survey were slightly above the 2009-2024 averages.

	A4	D3	M3
2024 Surface	26.31	27.1	30.37
2009-2024 Average Surface	26.137	26.931	30.247
2024 Bottom	27.2	27.86	30.62
2009-2024 Average Bottom	26.867	27.734	30.842