

# August 2021

## WQAUG21 Hypoxia Summary 7 Stations below 3.0 mg/L

CT DEEP sampled 43 stations during the WQAUG21 survey that was conducted 2-4 August 2021. The lowest dissolved oxygen (DO) concentration recorded during this survey was 0.99 mg/L at Station A4. Six additional stations were below 3.0 mg/L and 24 additional stations were below 4.8 mg/L. Data are available in an Excel spreadsheet format or from the [UCONN ERDDAP site](#).

Station A4 consistently has the lowest DO concentrations throughout WQAUG surveys. The following statistics summarize the bottom DO levels during all WQAUG surveys conducted by CT DEEP between 1998 and 2021 (n=24) for Station A4: the median is 1.73 mg/L, the mean is 1.94 mg/L (+/- 1.11 mg/L), and the values range from a minimum of 0.32 mg/L (1998) to a maximum of 4.63 mg/L (2016). WQAUG21's 0.99 mg/L ranks as the seventh lowest bottom DO recorded.

During WQAUG21, 206.1 km<sup>2</sup> of bottom water had concentrations of dissolved oxygen below 3.0 mg/L (Table 1). Of those 206.1 km<sup>2</sup>, 31.3 km<sup>2</sup> were below 2 mg/L and 21.8 km<sup>2</sup> were below 1.0 mg/L. In 2020, there were 164.2 km<sup>2</sup> of bottom water with DO concentrations less than 3.0 mg/L and an additional 1306 km<sup>2</sup> with concentrations less than 4.8 mg/L. There were 231.6 km<sup>2</sup> of bottom water that had DO concentrations less than 3.0 mg/L during the WQAUG19 survey. An additional 987.2 km<sup>2</sup> of bottom water had concentrations less than 4.8 mg/L. The areal estimates of bottom waters with DO concentrations less than 3.0 mg/L range from 0 km<sup>2</sup> (2017, 2016, and 2000) to 515.4

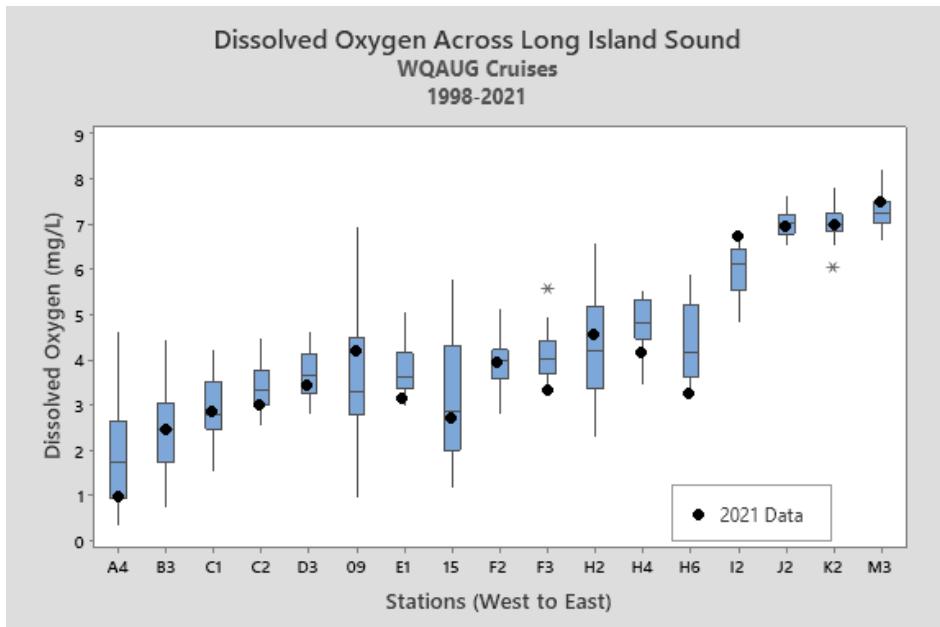
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### Long Island Sound Water Quality Monitoring Program

<https://portal.ct.gov/DEEP-LIS>

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# Dissolved Oxygen

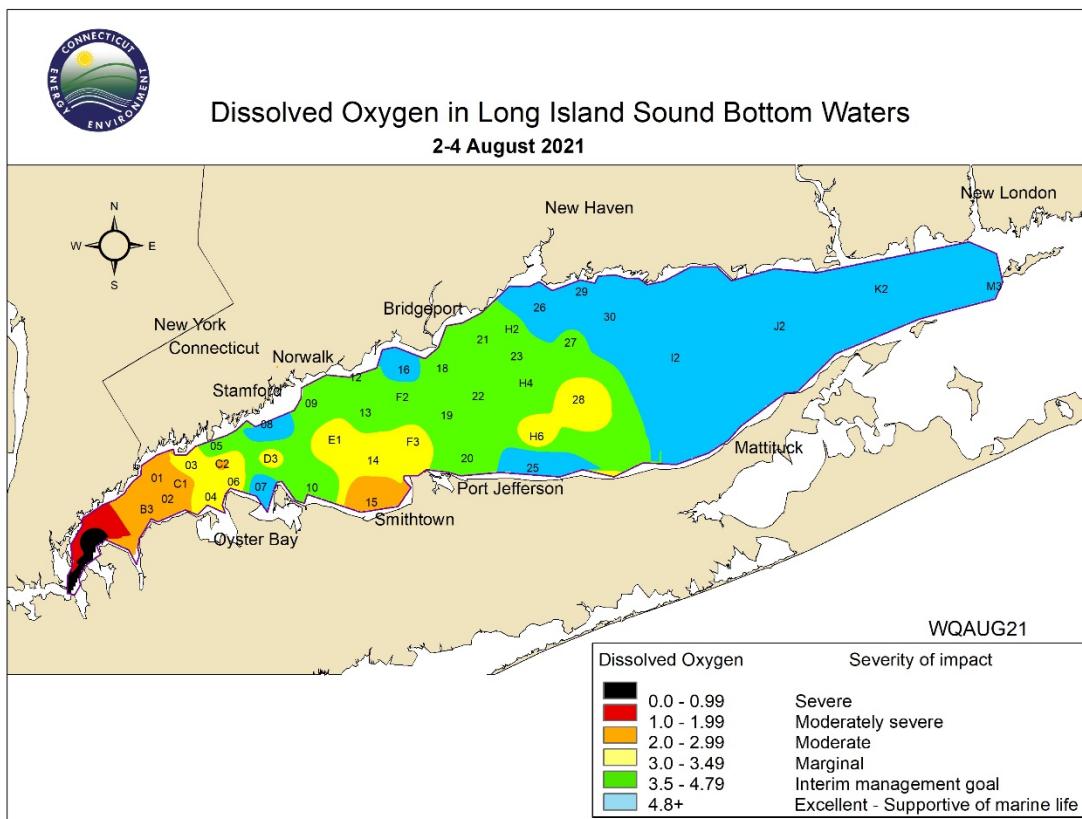


Table 1. Minimum Dissolved Oxygen Concentrations and Areal Estimates for WQAUG Cruises Conducted from 1998-2021 by CT DEEP.

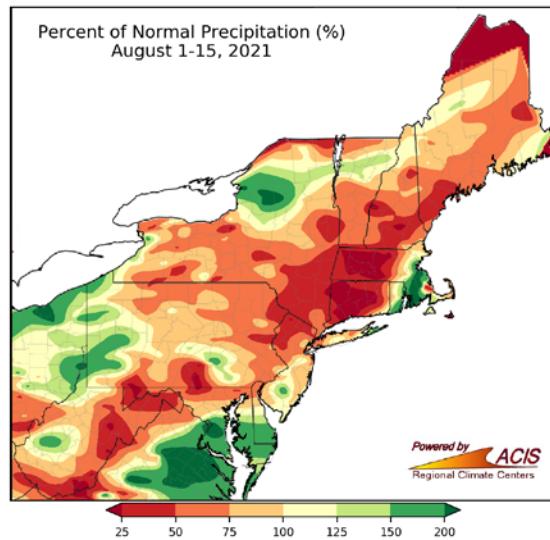
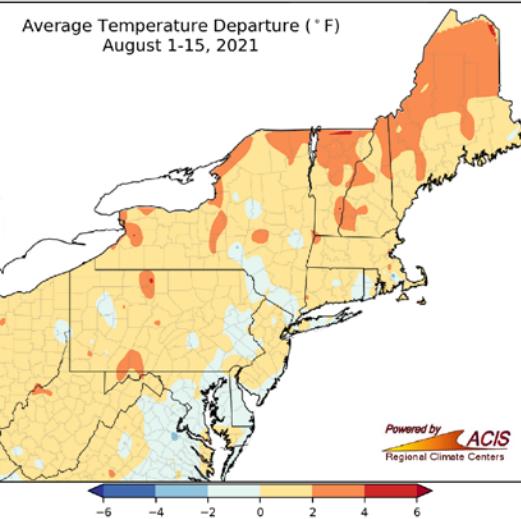
Cruise	Minimum DO Observed (mg/L)	Station with Minimum DO	Area under 4.8 mg/L (km <sup>2</sup> )	Area under 3 mg/L (km <sup>2</sup> )
WQAUG98	0.33	A4	1188.6	312.5
WQAUG99	0.8	A4	1458.6	311.5
WQAUG00	3.13	06	1183.2	0
WQAUG01	2.23	A4	1532.3	165.8
WQAUG02	0.56	02	1303.5	324.7
WQAUG03	1.91	B3	1733	275.1
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

# Weather

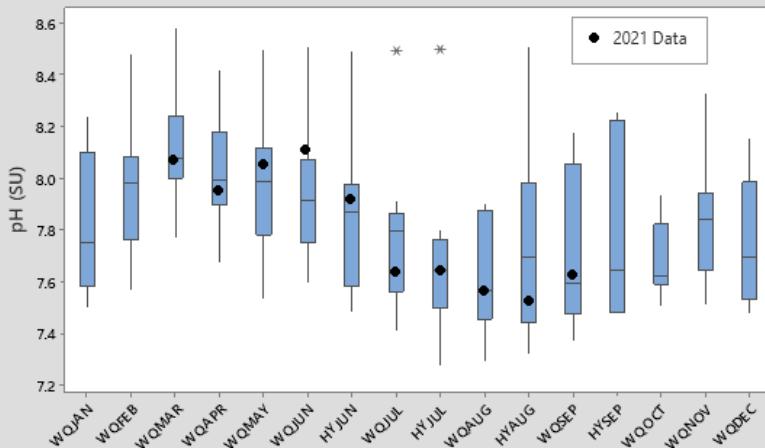
During the survey, temperatures at Bridgeport ranged from 80°F on 8/2 to 74°F on 8/4. Temperatures recorded at Bridgeport, Islip, JFK, and La Guardia were all close to normal for the August 1-15 period.

Over the course of the survey only 0.01 inches of rain fell at Bridgeport on 8/4. August 1-15, 2021 ranked as the 7<sup>th</sup> driest on record for Bridgeport with only 0.35 inches of precipitation recorded. Hartford, JFK, and La Guardia also below normal precipitation. Islip, however, received slightly more precipitation than normal, recording 2.28 inches.

More detailed weather information can be viewed on the Northeast Regional Climate Center's website.



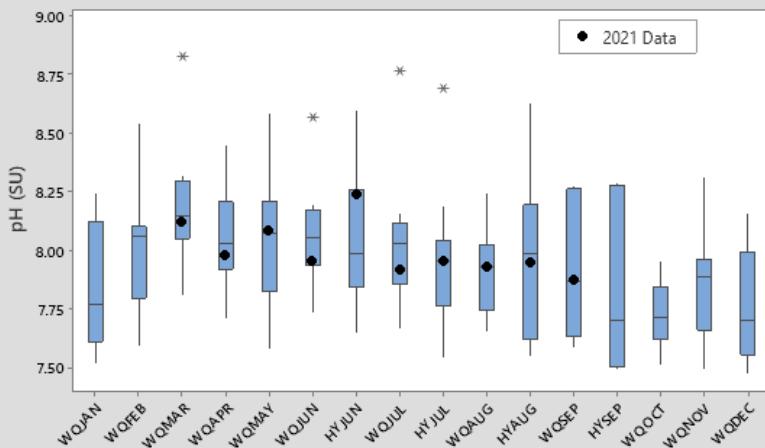
Average Bottom pH of Long Island Sound  
2011-2021



During the WQAUG21 survey, the surface pH averaged 7.92 SU, and the bottom pH averaged 7.54 SU. Median values for WQAUG surveys (data from 2011 to 2021) are: 7.85 SU and 7.64 SU for surface and bottom, respectively.

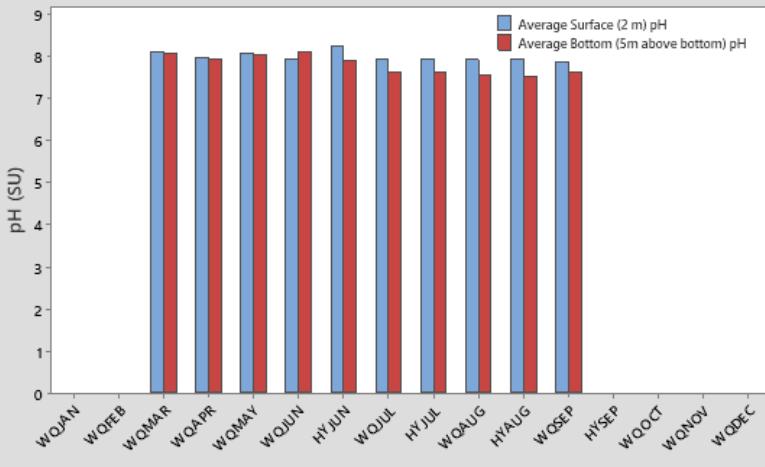
For WQAUG21, surface pH ranged from 7.62 SU (Station 16) to 8.02 SU (Station 28). Bottom pH ranged from 7.23 (Station A4) to 7.85 SU (Station 25).

Average Surface pH of Long Island Sound  
2011-2021



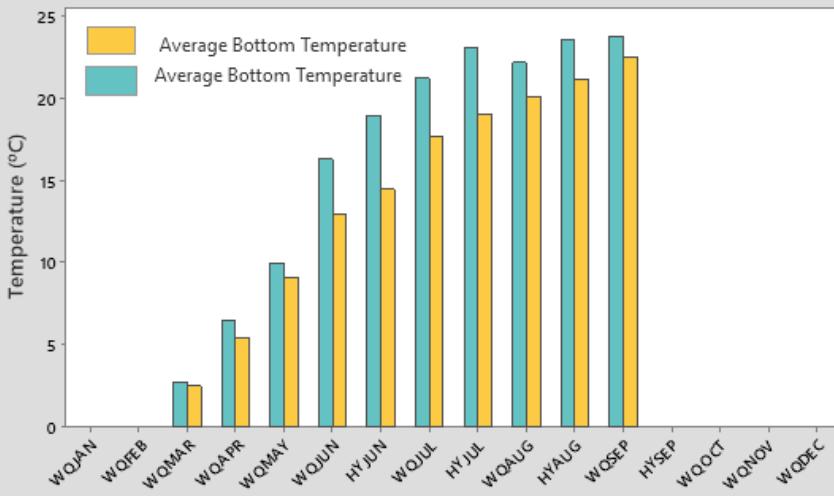
The average surface and bottom pH boxplots and bar charts only include the 17 year-round water quality stations.

Average Monthly pH of Long Island Sound  
2021



# Temperature

Average Monthly Temperature of Long Island Sound 2021



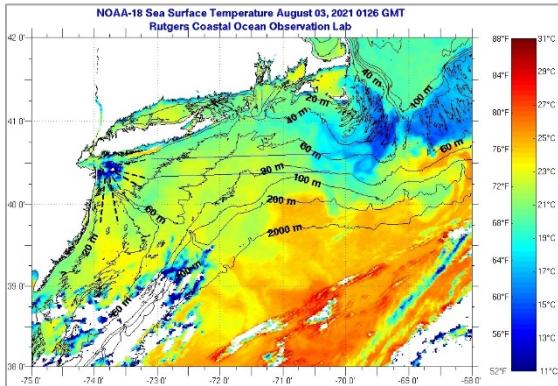
During the WQAUG21 survey the average surface water temperature (all stations sampled) was 22.32°C and bottom waters averaged 20.40°C.

The warmest surface temperature recorded during the WQAUG21 survey was 23.21°C at Station 26 and the warmest bottom temperature recorded was 22.45°C at Station 25.

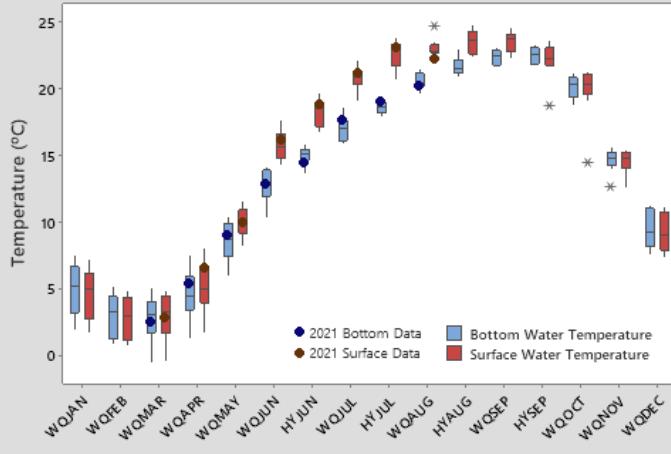
Station 28 had the greatest temperature difference between the surface and bottom water ( $\Delta T$ ), 4.41°C.

Comparatively, both the average bottom and surface water temperatures were slightly higher in 2020; the surface waters averaged 24.68°C and bottom waters averaged 21.79°C (all stations sampled).

*The 2011-2021 average surface and bottom temperature graphs reflect only data from the 17 year-round water quality stations.*



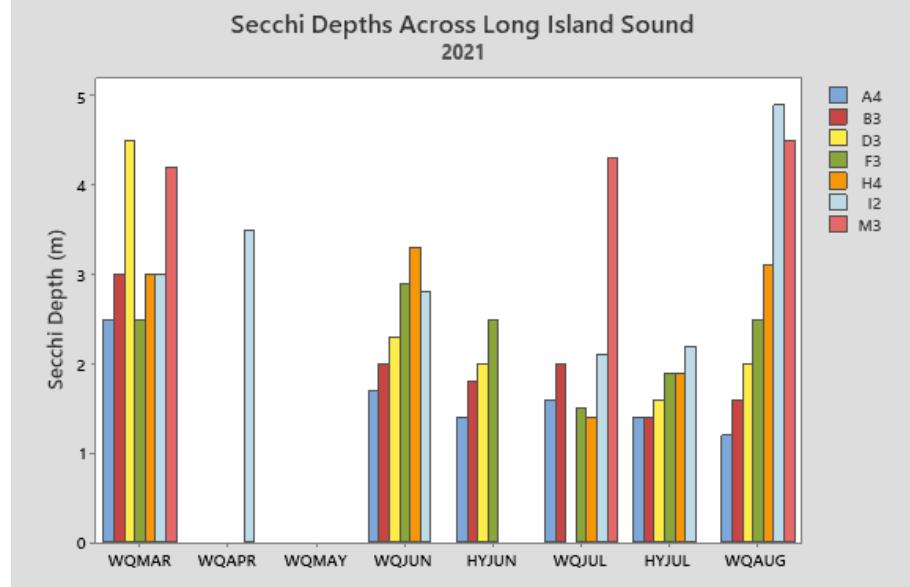
Average Long Island Sound Water Temperatures 2012-2021



Utilizing the most recent ten years of data (2012-2021) collected during the WQAUG surveys, the mean bottom temperature (of the 17-year round stations) is 20.47°C, while the mean surface temperature is 22.83°C. The maximum surface temperature recorded was 26.18°C (Station H4, 2018), and the minimum was 19.21°C (Station M3, 2014). The maximum bottom water temperature recorded was 23.62°C (Station H2, 2016), and the minimum was 16.57°C (Station M3, 2019).

# Secchi Disk Depths

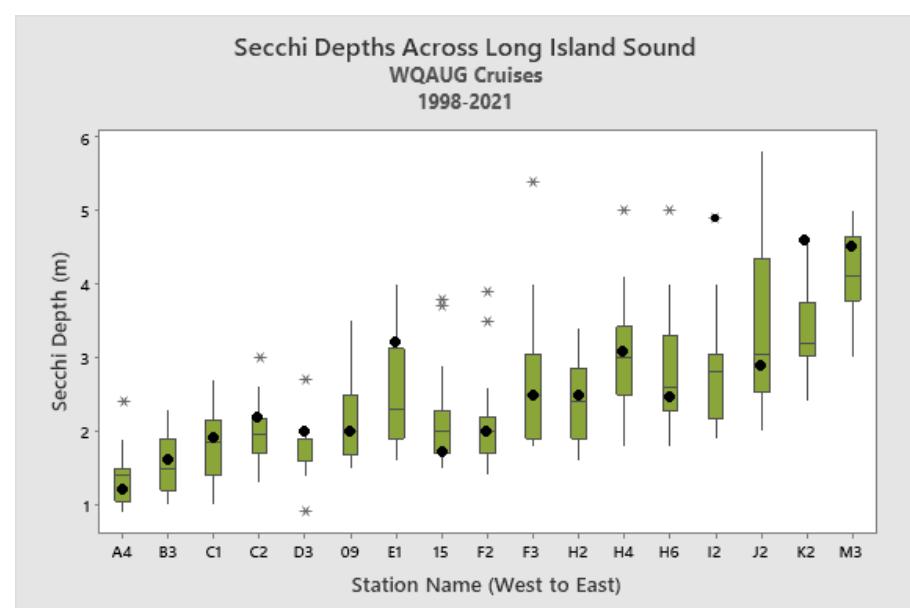
In order to assess the water clarity across Long Island Sound, Secchi disks are used at each station. The black and white disk is lowered into the water column until such a depth is reached that the black and the white quarters can no longer be differentiated. This is called the Secchi depth.



The [Long Island Sound Report Card](#) developed by Save the Sound utilizes the following water clarity depth thresholds:

1. >2.28 m (A- to A+; 90-100)
2. 2.12 to <2.28 (B- to B+; 80-89)
3. 1.95 to <2.12 (C- to C+; 70-79)
4. 1.8 to <1.95 (D- to D+; 60-69)
5. 0 to <1.8 (F; <60)

Secchi depths were taken at 42 stations during the WQAUG21 survey; these depths ranged from 1.0 meters (Station 29) to 4.9 meters (Station I2).



In Report Card terms, 24 stations were in the A-range (>2.28m), 2 stations were in the B-range (2.12-2.28m), 8 stations were in the C-range (1.95 to <2.12m), 2 stations were in the D-range (1.8 to <1.95m), and 6 stations failed (<1.8m).

## Next Survey

The next survey is scheduled for 16 - 18 August (HYAUG21) aboard the R/V John Dempsey. The schedule for the remainder of 2021 is available on our website.



Connecticut Department of  
**ENERGY &  
ENVIRONMENTAL  
PROTECTION**