

August 2019

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WQAUG19 Hypoxia Summary

4 Stations below 3.0 mg/L



Long Island Sound
Water Quality Monitoring
Program

www.ct.gov/deep/lis

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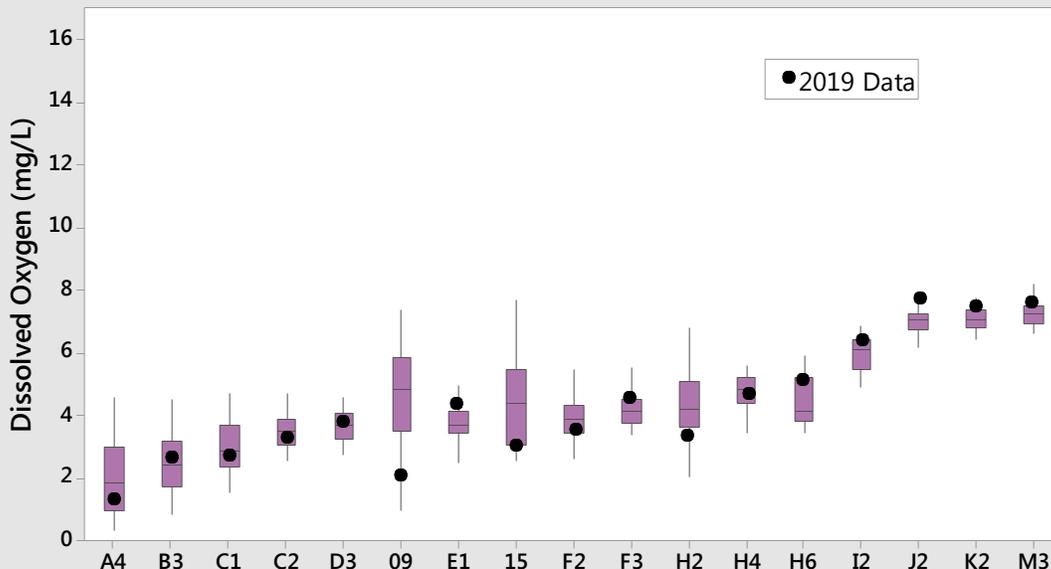
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CT DEEP sampled 42 stations during the WQAUG19 survey that was conducted 29 July – 1 August 2019. The lowest dissolved oxygen (DO) concentration recorded during this survey was 1.29 mg/L at Station A4. Six additional stations were below 3.0 mg/L, and a total of 32 stations were below 4.8 mg/L. Data are available in an [Excel spreadsheet format](#).

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 2019 (n=22) for Station A4: the median is 1.89 mg/L, the mean is 2.07 mg/L (+/- 1.19 mg/L), and the values range from a minimum of 0.32 mg/L (1998) to a maximum of 4.62 mg/L (2016). WQAUG19's 1.29 mg/L ranks as the seventh lowest bottom DO recorded.

There were 231.6 km² of bottom water that had DO concentrations less than 3.0 mg/L during the WQAUG19 survey. An additional 987.2 km² 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 km² (2017, 2016, and 2000) to 515.4 km² (2006).

Bottom Dissolved Oxygen Concentrations Across Long Island Sound
WQAUG Cruises
1998 - 2019



Dissolved Oxygen

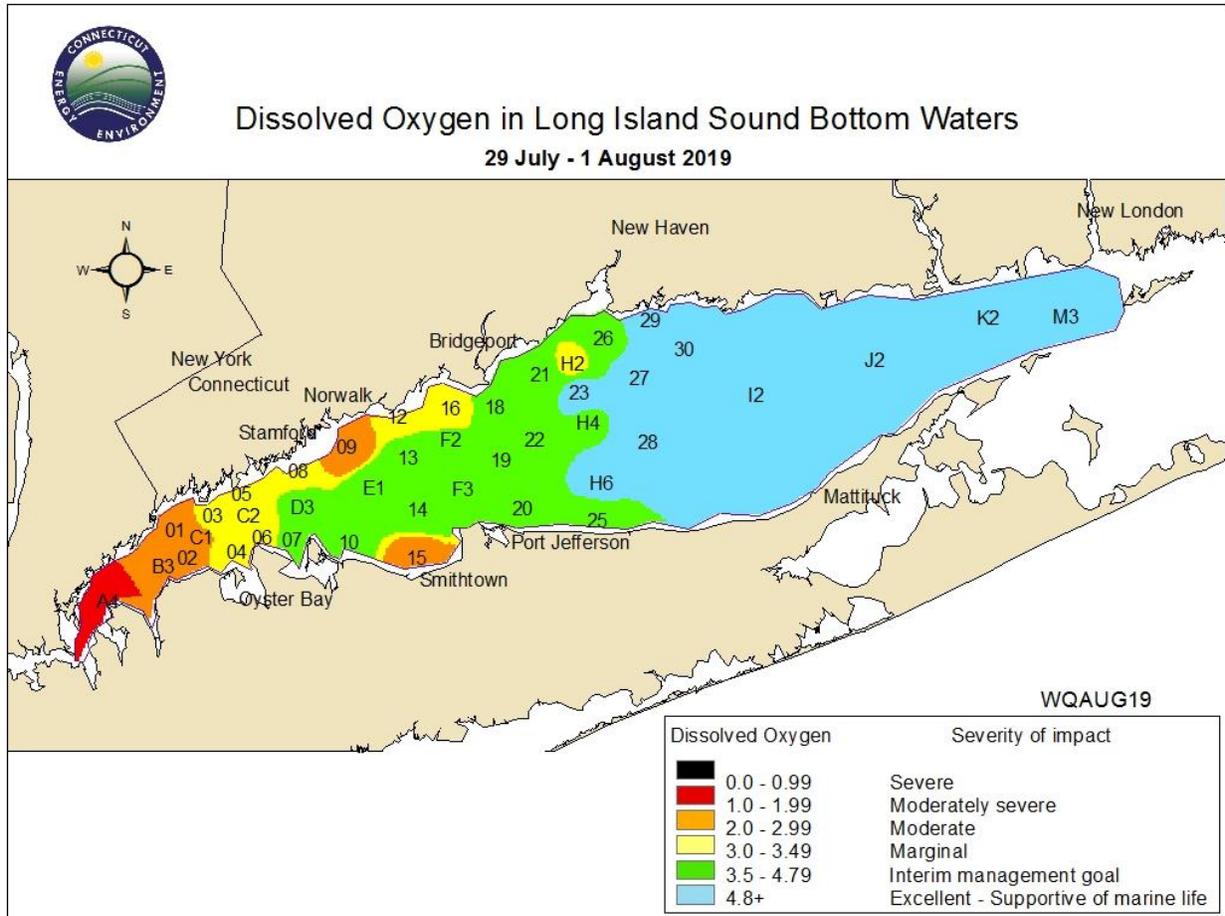


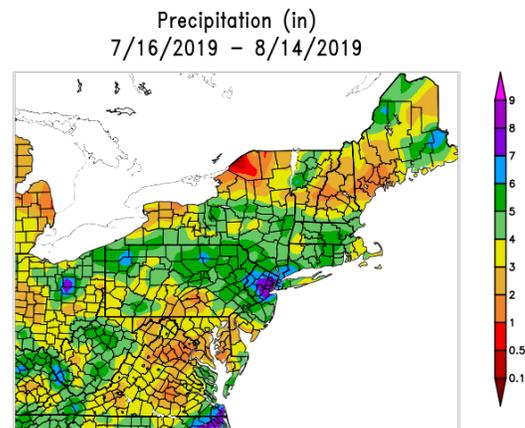
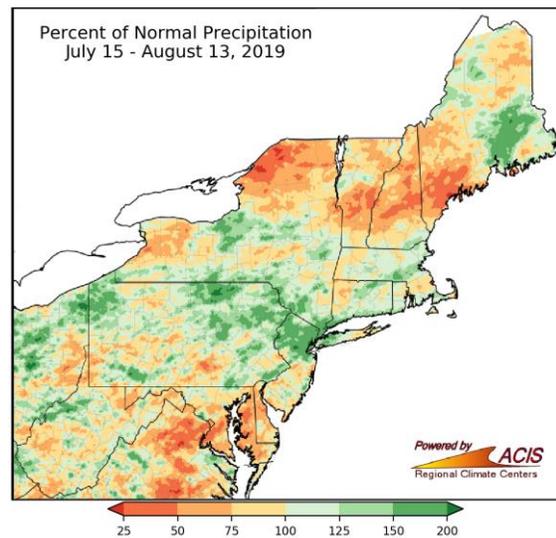
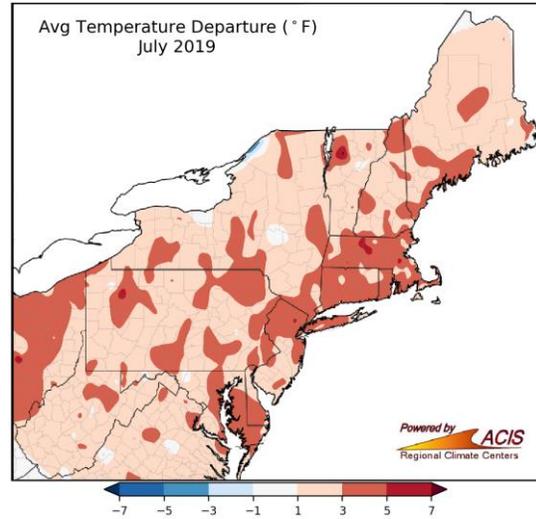
Table 1. Minimum Dissolved Oxygen Concentrations and Areal Estimates for WQAUG Cruises Conducted from 1998-2018 by CT DEEP.

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

The WQAUG19 survey (29 July-1 August) occurred at the end of the hottest month on record. Temperatures for the last 3 days of July and the first day of August were in the high 80s/low 90s in the areas of Bridgeport, CT; Islip, NY; LaGuardia Airport, NY; and Central Park, NY. These temperatures are, of course, much higher than the normal at each location, which are all in the low 80s.

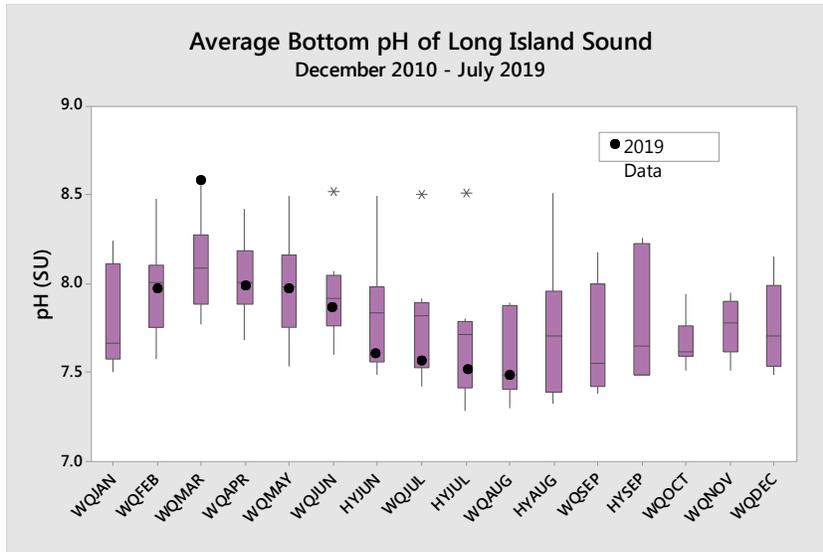
July precipitation was significantly above the normal for the Long Island Sound region. To close out the month, thunderstorms struck much of the northern Eastern Seaboard on the afternoon of July 31. Connecticut was hit especially around Hartford County, and Bridgeport received 0.47 inches of rain. Bridgeport ended with a July total of 7.57 inches, more than twice the normal (3.46 in.). New York was also affected; Central Park received 0.36 inches, totaling 5.77 inches (+1.17 inches on the normal), and LaGuardia Airport received 0.58 inches of rain, totaling 6.11 inches for the month (+1.61 inches on the normal). Islip, NY (Long Island) was narrowly missed, receiving only 0.05 inches, adding to a monthly sum that was 0.04 inches below the normal.

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



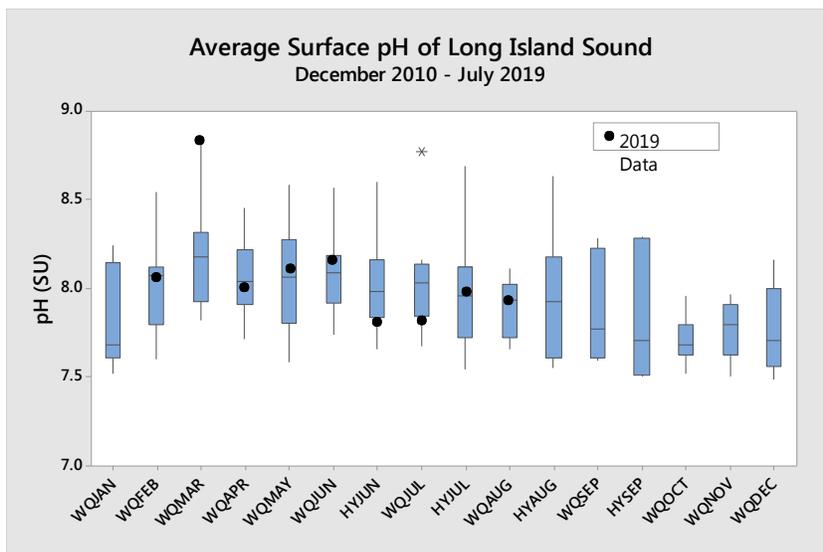
Generated 8/15/2019 at HPRCC using provisional data.

NOAA Regional Climate Centers

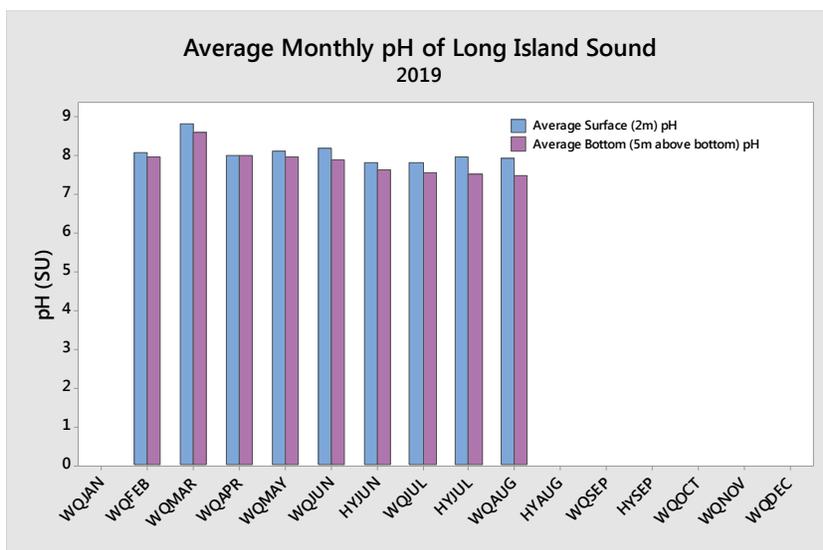


During the WQAUG19 survey, the surface pH averaged 7.87 SU, and the bottom pH averaged 7.52 SU. These numbers are similar to the median values for WQAUG surveys (data from 2011 to 2019); 7.85 SU is the surface pH median, and 7.64 SU is the bottom pH median.

For WQAUG19, surface pH ranged from 7.39 SU (Station 18) to 8.11 SU (Station 06). Bottom pH ranged from 7.15 (Station A4) to 7.88 SU (Station J2).

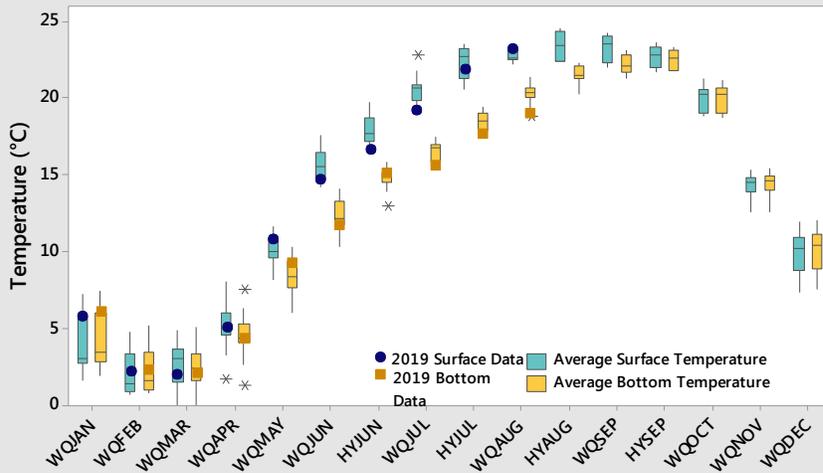


The average surface and bottom pH boxplots and bar charts only include the 17 year-round water quality stations.



Temperature

Average Long Island Sound Water Temperatures
2009 - 2019



Surface waters averaged 23.15°C and bottom waters averaged 19.58°C during the WQAUG19 survey.

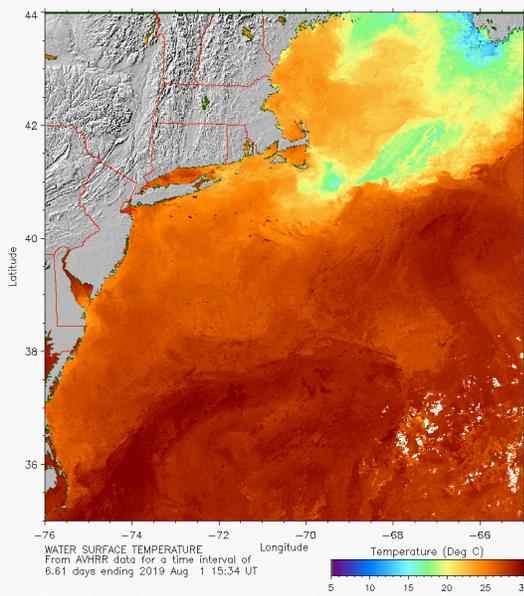
Comparatively, at this time last year, both the average bottom and surface water temperatures were slightly higher. The surface waters averaged 23.47°C and bottom waters averaged 20.36°C.

The warmest surface temperature recorded during the WQAUG19 survey was 25.57°C at Station 06 (1.71°C warmer than that of WQAUG18), and the warmest bottom temperature recorded was 22.89°C at Station 29 (1.85°C warmer than that of WQAUG18).

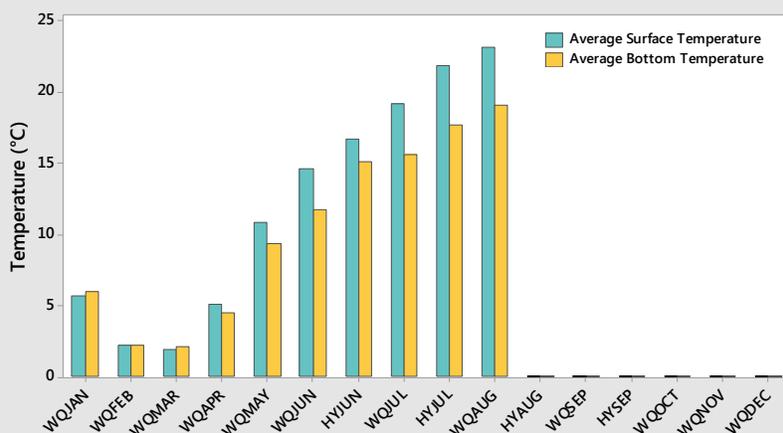
Station C2 had the greatest temperature difference between the surface and bottom water (ΔT), 5.72°C.

According to the most recent ten years of data (2010-2019) collected during the WQAUG surveys, the mean bottom temperature is 20.40°C, while the mean surface temperature is 22.79°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).

The 1998-2019 average surface and bottom temperature graphs reflect only data from the 17 year-round water quality stations.



Average Monthly Temperature of Long Island Sound
2019



Secchi Disk Depths

Water clarity is a measure of how much light penetrates the water column, and clarity can be reduced by the presence of suspended solids, organic matter, phytoplankton, and zooplankton.

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.

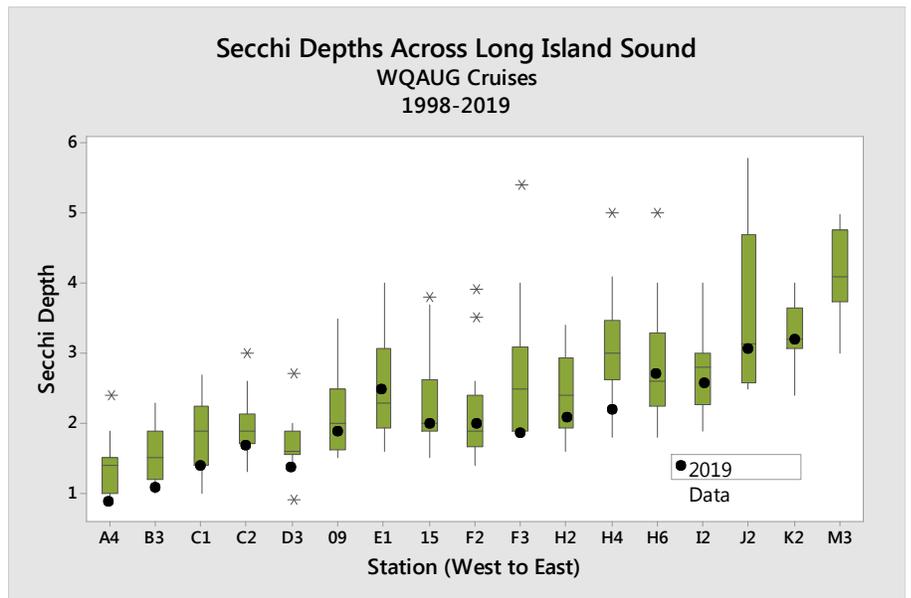
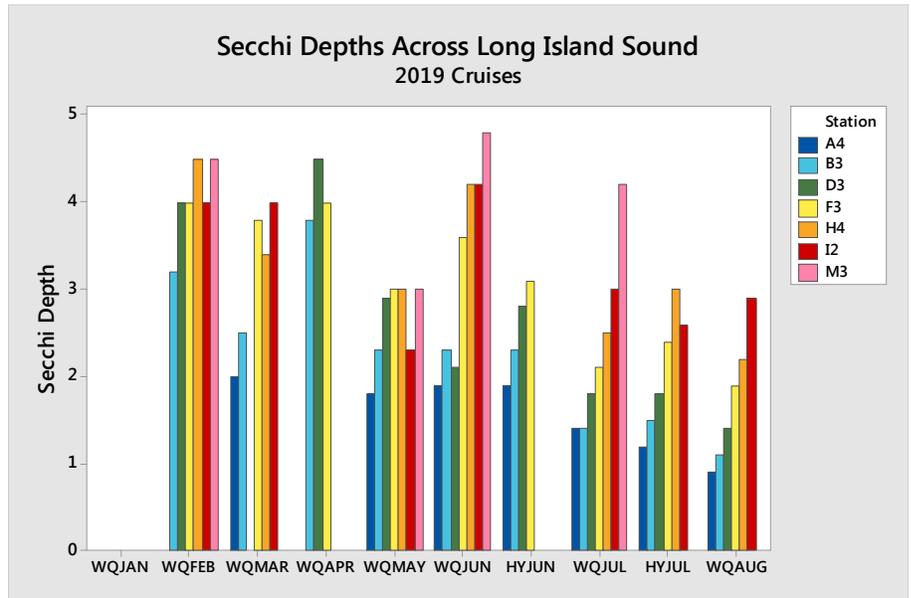


The [Long Island Sound Report Card](#) developed by Save the Sound utilizes the following water clarity depth thresholds:

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 40 stations during the WQAUG19 survey; these depths ranged from 0.90 meters (Station A4) to 3.2 meters (Station K2).

In Report Card terms, 11 stations were in the A-range (>2.28m), 3 stations were in the B-range (2.12-2.28m), 8 stations were in the C-range (1.95 to <2.12m), 7 stations were in the D-range (1.8 to <1.95m), and 11 stations failed (<1.8m).



Next Survey

The next survey is scheduled for 12-16 August (HYAUG19) aboard the R/V John Dempsey. The schedule for the remainder of 2019 is available on our website.



Connecticut Department of
**ENERGY &
ENVIRONMENTAL
PROTECTION**