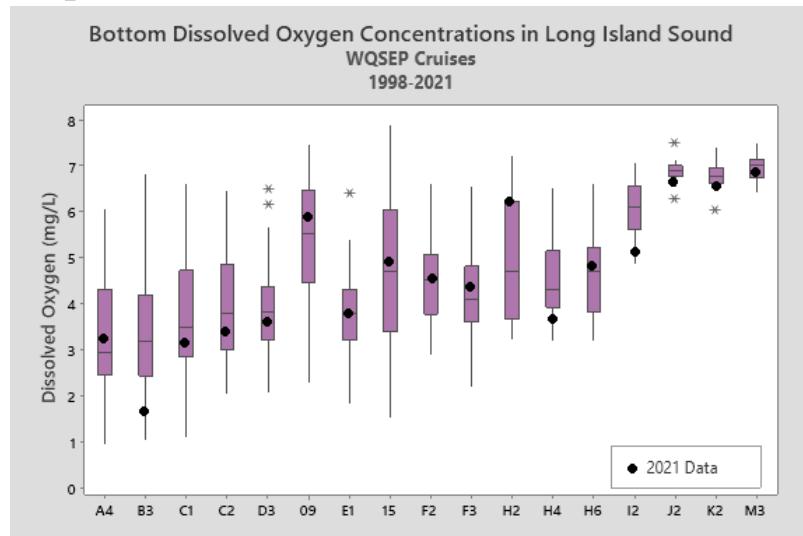


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Long Island Sound
Water Quality Monitoring
Program

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

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WQSEP21 Summary

Only 1 Station under 3.0 mg/L

CT DEEP sampled 40 stations during the WQSEP21 survey that was conducted 30 August- 1 September 2021. The lowest dissolved oxygen (DO) recorded during this survey was at Station B3 with a concentration of 1.69 mg/L. All other stations were above 3 mg/L. Five stations were less than 3.5 mg/L, and 11 additional stations were under the 4.8 mg/L threshold. Data are available in an Excel spreadsheet format and on the [UConn ERDDAP site](#).

Between 1998 and 2021, DO levels in the bottom waters of Long Island Sound during the WQSEP surveys were consistently below 3.0 mg/L; concentrations were only above 3.0 mg/L on 5 occasions. On two occasions, the bottom waters were less than 1 mg/L (Table 1).

The DO at Station A4 during the WQSEP21 survey (3.23 mg/L) was slightly below its average (3.32 mg/L) and above the median (2.95 mg/L) values from all WQSEP surveys conducted by CT DEEP between 1998 and 2021 (n=23), where the DOs at Station A4 ranged from 0.93 mg/L (WQSEP04) to 6.08 mg/L (WQSEP00). The WQSEP21 survey was the second survey since WQSEP14 where Station A4 did not have the lowest DO.

During the WQSEP21 survey, there were 43.5 km² of bottom water that had DO concentrations less than 3.0 mg/L, and an additional 748.7 km² of bottom water with DO concentrations less than 4.8 mg/L. The areal estimates below 3.0 mg/L for WQSEP surveys from 1998-2021 average 118.3 km².

Dissolved Oxygen

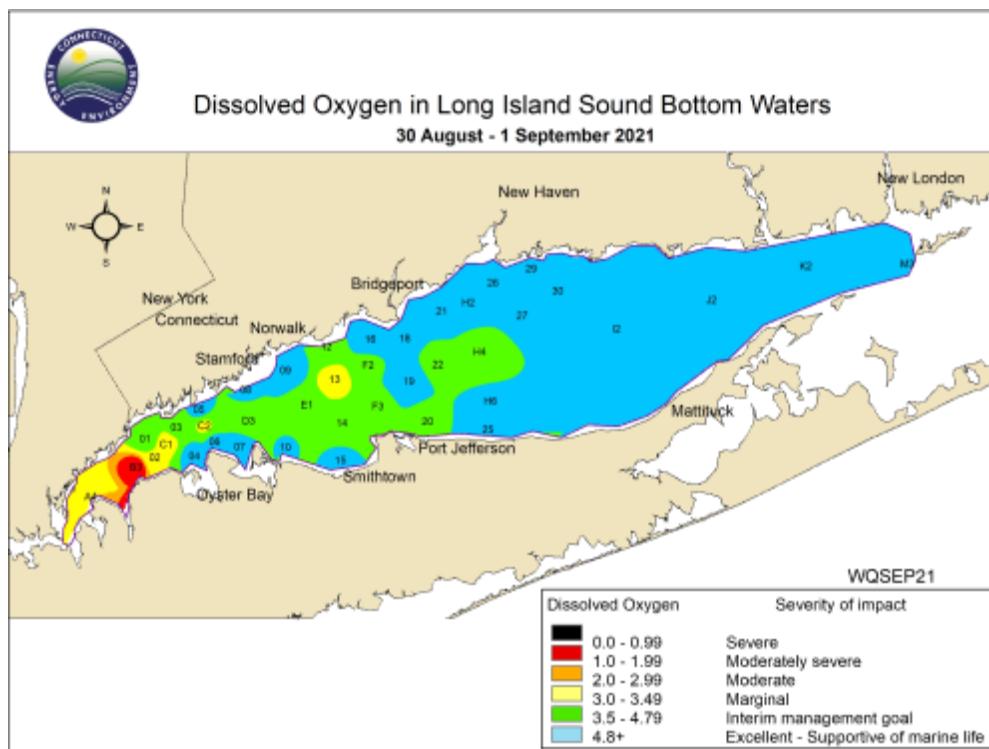


Table 1. Minimum Dissolved Oxygen Concentrations and Areal estimates for WQSEP Cruises Conducted from 1998-2021 by CT DEEP.

Cruise	Minimum DO Observed (mg/L)	Station with Minimum DO	Area under 4.8 mg/L (km ²)	Area under 3 mg/L (km ²)
WQSEP98	1.19	B3	1457.8	435.3
WQSEP99	3.75	H6	169.3	0
WQSEP00	3.39	15	455	0
WQSEP01	1.02	02	1216.7	292.4
WQSEP02	4.58	B3	107.5	0
WQSEP03	2.23	E1	1241.1	33.5
WQSEP04	0.93	A4	1396.7	296.1
WQSEP05	0.99	A4	1031.8	223.8
WQSEP06	2.89	F3	593.9	0
WQSEP07	2.88	A4	886	41.6
WQSEP08	2.17	02	1562.5	340.5
WQSEP09	1.84	E1	1234.1	332.1
WQSEP10	3.66	A4	213.7	0
WQSEP11	4.32	A4	75	0
WQSEP12	2.55	02	1643	131.7
WQSEP13	2.33	B3	1207.3	100.1
WQSEP14	2.74	A4	856.7	34.3
WQSEP15	2.52	A4	892.4	56.3
WQSEP16	1.87	A4	1170.1	139
WQSEP17	2.46	A4	565.9	109.8
WQSEP18	2.34	A4	1411.8	133.6
WQSEP19	2.74	E1	699	52.6
WQSEP20	2.79	A4	875.6	43.0
WQSEP21	1.69	B3	792.2	43.5

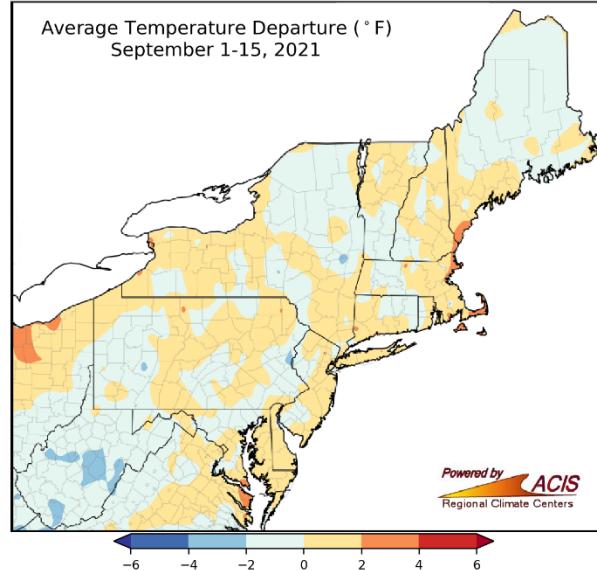
Weather

The WQSEP21 cruise was conducted from September 30th to 1 September. Most areas within the Northeast such as Boston, MA and Bridgeport, CT had some of their warmest Septembers. Boston, MA had their 7th warmest while Bridgeport, CT had their 14th warmest. The normal temperature for Bridgeport is 70.1°F and it had a departure of 1.4°F. Only a few areas had temperature departures that were cooler than their normal, with Hartford, CT being amongst those few. Hartford, CT had a departure of -0.2°F from the normal 67.6°F.

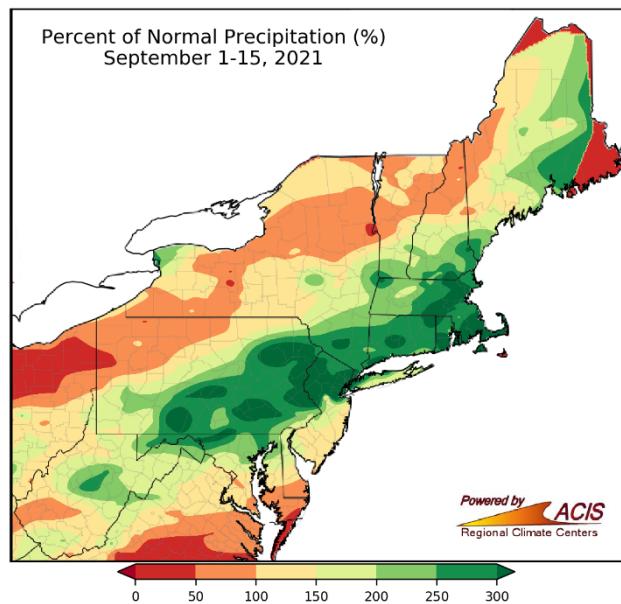
Precipitation in the Northeast varied across the Northeast, especially with the remnants of Hurricane Ida being present in the first half in the month. Hurricane Ida brought additional amounts of precipitation to areas such as Bridgeport and Hartford. Bridgeport recorded it's wettest first half of September (1-15) on record (7.87 inches of rain) and its 2nd wettest September on record. The normal amount of precipitation in Bridgeport, CT for September 1-15 is 1.88 inches but there were 6.52 inches recorded this year, which is 347% above normal. Hartford, CT received 5.47 inches which is 274% above the normal 2.00 inches for the September 1-15 period.

More detailed weather information can be viewed on the [Northeast Regional Climate Center's website](#).

Average Temperature Departure (° F)
September 1-15, 2021



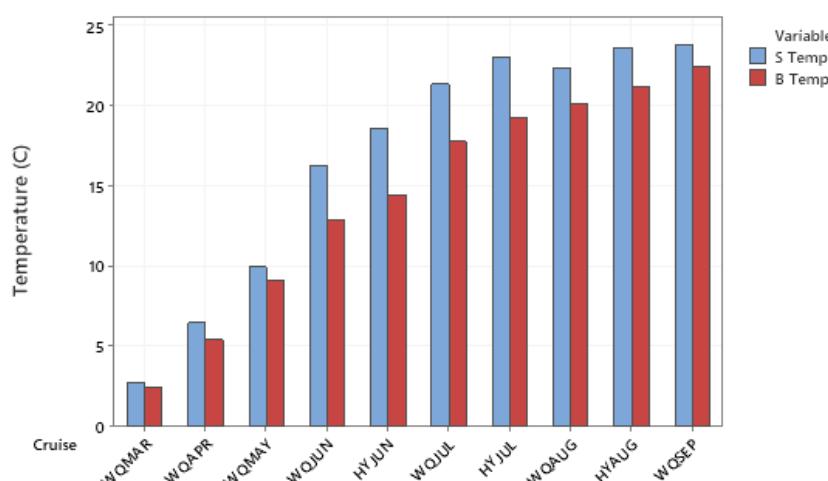
Percent of Normal Precipitation (%)
September 1-15, 2021



Water Temperature

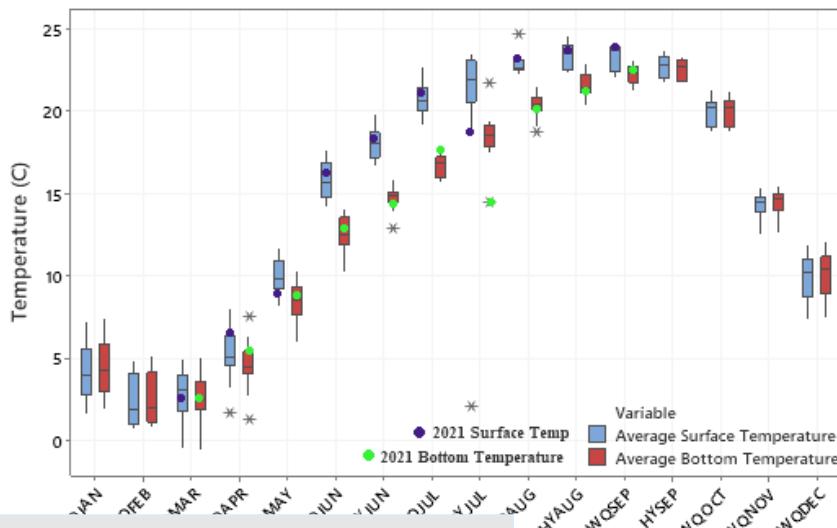
Average Long Island Sound Water Temperatures Per Survey

2021



Average Long Island Sound Water Temperatures

2009-2021



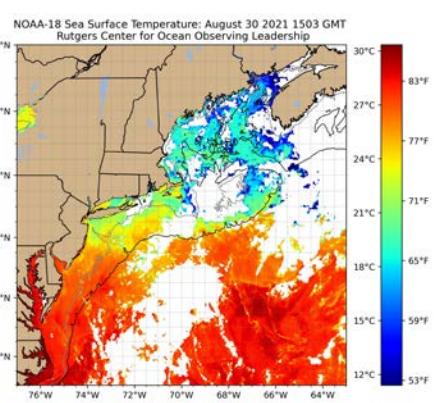
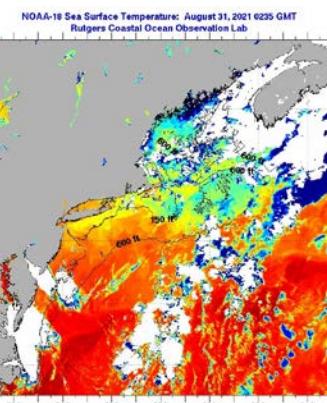
Sea surface temperature (SST) data from Rutgers University's Coastal Ocean Observation Lab are presented to the right. The image on the left displays the SST for August 31 at 9:35 PM; the observed SST is around 25°C in Long Island Sound (LIS). The image on the right is from 10:03 AM on August 30th. SSTs are between 21 and 24°C within LIS.

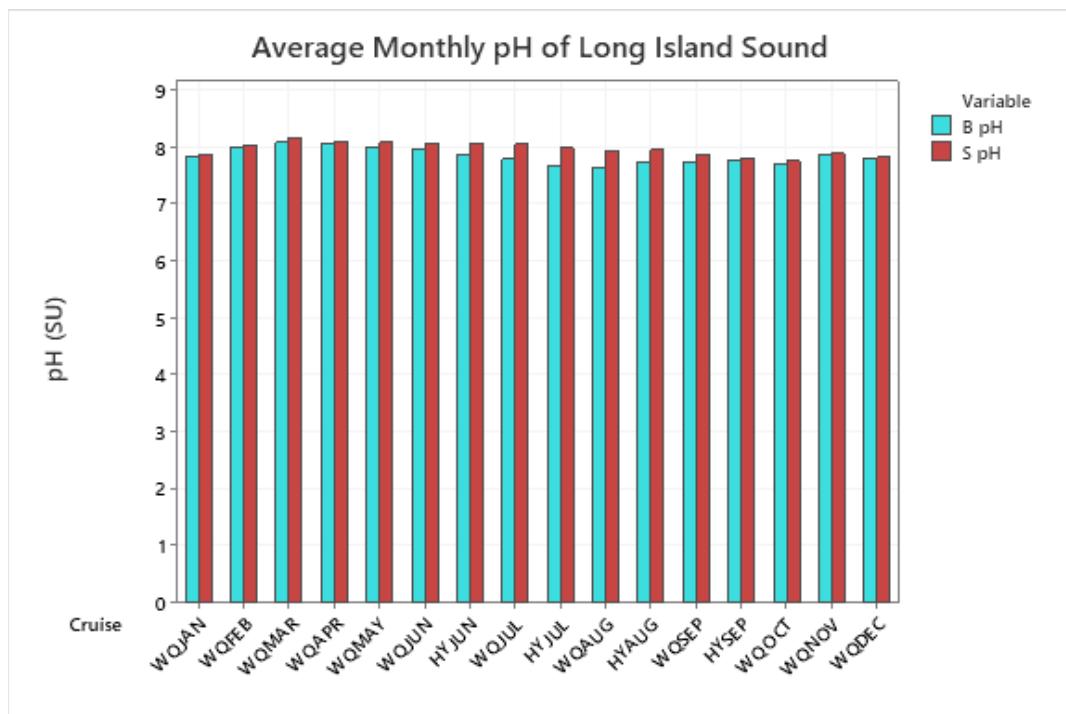
More information about sea surface temperature can be found on the Rutgers University Website: [Sea Surface Temperature - IMCS Coastal Ocean Observation Lab \(rutgers.edu\)](http://www.rutgers.edu/~imcs/obs/sst.html)

Surface temperatures for HYAUG21 and WQSEP21 were very similar. HYAUG21 and WQSEP21 had average surface temperatures of 23.64°C and 23.82°C respectively. The average bottom temperature had increased 1.34°C (21.41 °C to 22.75°C) from HYAUG21 to WQSEP21. The maximum surface water temperature during the WQSEP21 survey occurred at Station 04 (24.88°C), while the maximum bottom water temperature occurred at Station 25 (23.96°C).

Delta T's (difference between surface and bottom temperatures) ranged from 0°C (Station 25) to 2.68° (Station D3) and averaged 1.11°C. Decreasing Delta T's from the HYAUG21 survey indicate the weakening of stratification and increased mixing. In 2021, Tropical Storms Ida and Henri as well as frequent precipitation events throughout the summer, assisted with reducing the severity and duration of hypoxic conditions.

Note: The surface and bottom water temperatures discussed and graphed reflect data from all the stations sampled during WQSEP, not just the 17 year-round stations. (Editor's note: This is different than the previous 2021 cruise summaries which only used the 17 year-round stations in the boxplots. - KAO).

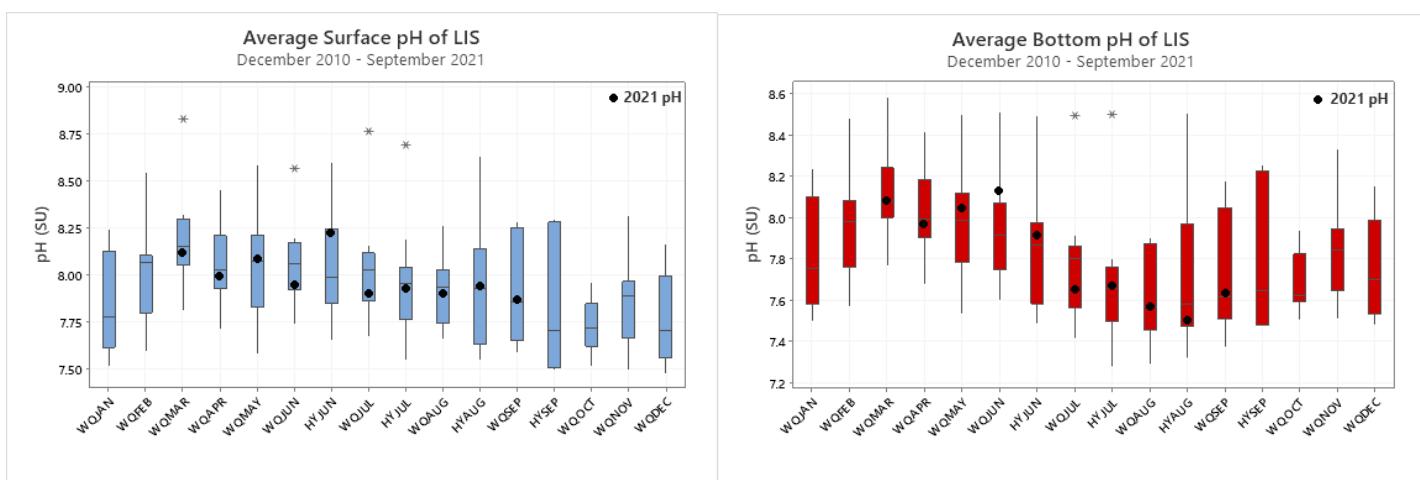




During the WQSEP21 survey, Long Island Sound had an average surface pH of 7.87 SU. The average bottom pH for Long Island Sound was 7.62 SU. These values were below the averages for all WQSEP surveys that occurred from 1998 to 2020, which were 7.96 SU for surface pH and 7.83 SU for bottom pH.

Looking closer at WQSEP21, the stations with the highest pH values were H4 for surface pH and 29 for bottom pH. Station H4 had a value of 8.01 SU while station 29 had a value of 7.94 SU. The stations with the lowest values were A4 for surface pH and B3 for bottom pH. Station A4 had a value of 7.45 SU while station B3 had a value of 7.31 SU.

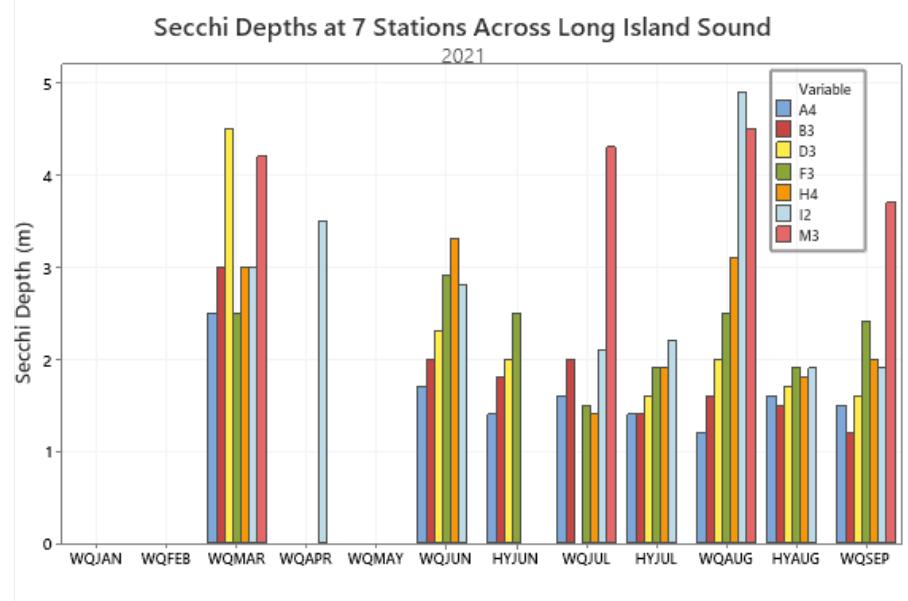
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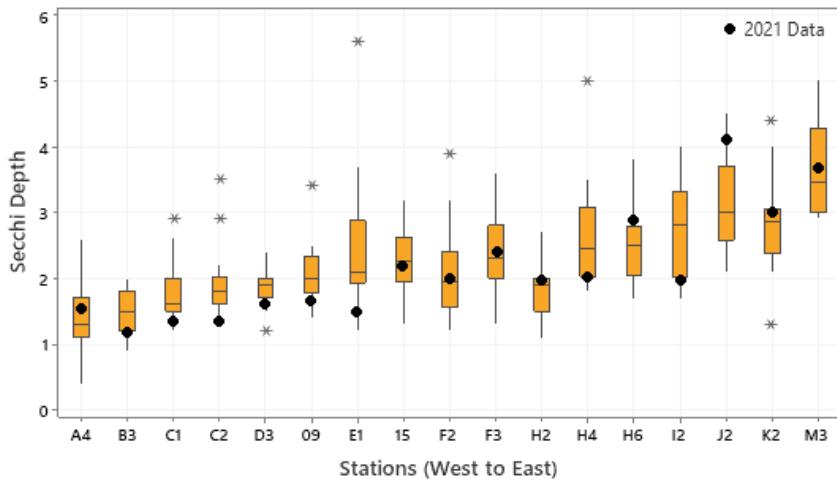
Secchi Disk Depths

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.

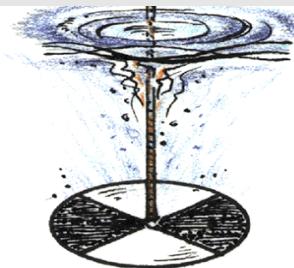
To assess the water clarity across Long Island Sound, Secchi disks are used at each station. The black and white disk is lowered into the water column until such a depth is reached that the black and the white quarters can no longer be differentiated. This is called the Secchi depth.



Secchi Depths at 17 Stations Across Long Island Sound
2000 - 2021 WQSEP Cruises



Secchi depths were taken at 40 stations during the WQSEP21 survey; the depths ranged from 1.0 meters at Station 02 to 4.1 meters at Station J2.



The Long Island Sound Report Card developed by Save the Sound utilizes the following water clarity depth thresholds:

1. >2.28 (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. <1.8 (F; <60)

Of the 40 stations measured this survey, 9 were in the A-range, 1 was in the B-range, 9 were in the C-range, 2 were in the D-range, and 19 failed.

Next Survey

Our next survey is scheduled for 13 September (HYSEP21) aboard the R/V Patricia Lynn.
The schedule for the remainder of 2021 is available on our website.



Connecticut Department of
**ENERGY &
ENVIRONMENTAL
PROTECTION**