

# July 2022

[Volume 6, Issue 4]

## HYJUL22 Hypoxia Summary

2 stations below 3.0 mg/L

20 Stations with Dissolved Oxygen Concentrations below 5 mg/L

CT DEEP sampled 40 stations during the HYJUL22 survey that was conducted 18-20 July 2022. The lowest dissolved oxygen (DO) recorded during this survey was at Station A4 with a concentration of 2.77 mg/ L. The next lowest DO occurred at Station 02 with a concentration of 2.99 mg/L. These numbers are significantly lower than during the HYJUL21 survey when the lowest DO was 3.32 mg/L at Station A4. In HYJUL22, a total of 5 stations (01, 02, A4, B3, and C1) were below 4 mg/L; however, a total of 14 stations were below 4.8 mg/L. Preliminary data from this survey and prior 2022 cruises are available in Excel spreadsheet format. CT DEEP data from 1991-present are also available in the UCONN CTDEEP Cruise Data Viewer App: <http://merlin.dms.uconn.edu:9988/webapps/home/> or the UCONN ERDDAP website:

[http://merlin.dms.uconn.edu:8080/erddap/tabledap/DEEP\\_WQ.html](http://merlin.dms.uconn.edu:8080/erddap/tabledap/DEEP_WQ.html).

In 2022, 48.6 km<sup>2</sup> of bottom water had concentrations below 3.0 mg/L and an additional 176.65 km<sup>2</sup> of bottom water had concentrations below 4.8 mg/L (but above 3 mg/L). In 2021, 0 km<sup>2</sup> of bottom water had concentrations below 3 mg/L and 522.7 km<sup>2</sup> had concentrations below 4.8 mg/L. During the HYJUL20 survey, there were 1476.9 km<sup>2</sup> of bottom water that had DO concentrations less than 4.8 mg/L, and 144.4 km<sup>2</sup> were less than 3.0 mg/L. Comparatively, in 2019 there were 511.8 km<sup>2</sup> of bottom water with DO concentrations less than 4.8 mg/L, and 46.1 km<sup>2</sup> of bottom water was less than 3.0 mg/L. Since 1998, DO levels in the bottom waters of Long Island Sound during the HYJUL survey have been above 3.0 mg/L on only four occasions: HYJUL21, HYJUL18, HYJUL14, and HYJUL04 (Table 1). The areal estimates of bottom waters with DO concentrations less than 4.8 mg/L range from 1,702 km<sup>2</sup> in 2002 to 148.2 km<sup>2</sup> in 2014. The most severe hypoxic event to occur during a HYJUL survey was in 2000 when approximately 447 km<sup>2</sup> of bottom water had concentrations below 3.0

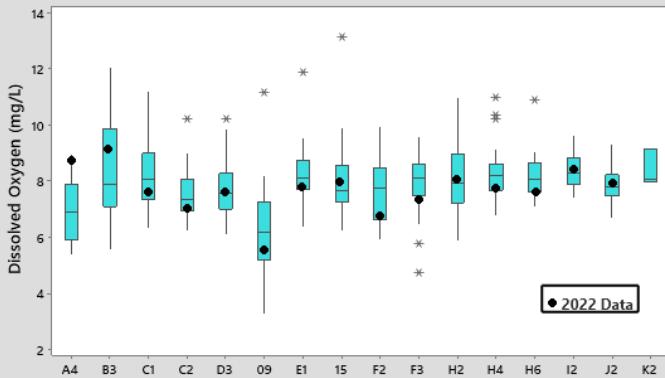


### Long Island Sound Water Quality Monitoring Program

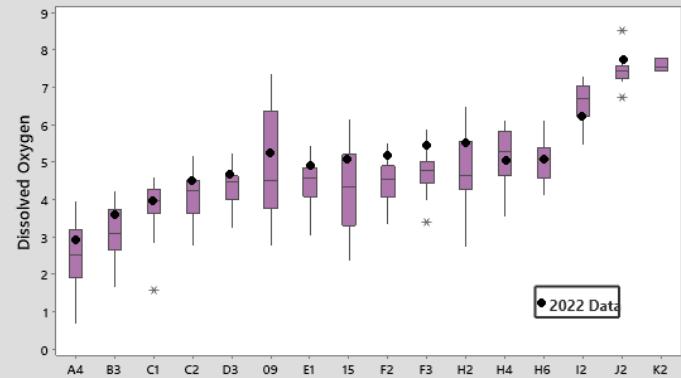
[www.ct.gov/deep/lis](http://www.ct.gov/deep/lis)

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Surface Dissolved Oxygen Concentrations Across Long Island Sound  
HYJUL Cruises  
1998-2022



Bottom Dissolved Oxygen Concentrations Across Long Island Sound  
HYJUL Cruises  
1998-2022



# Dissolved Oxygen

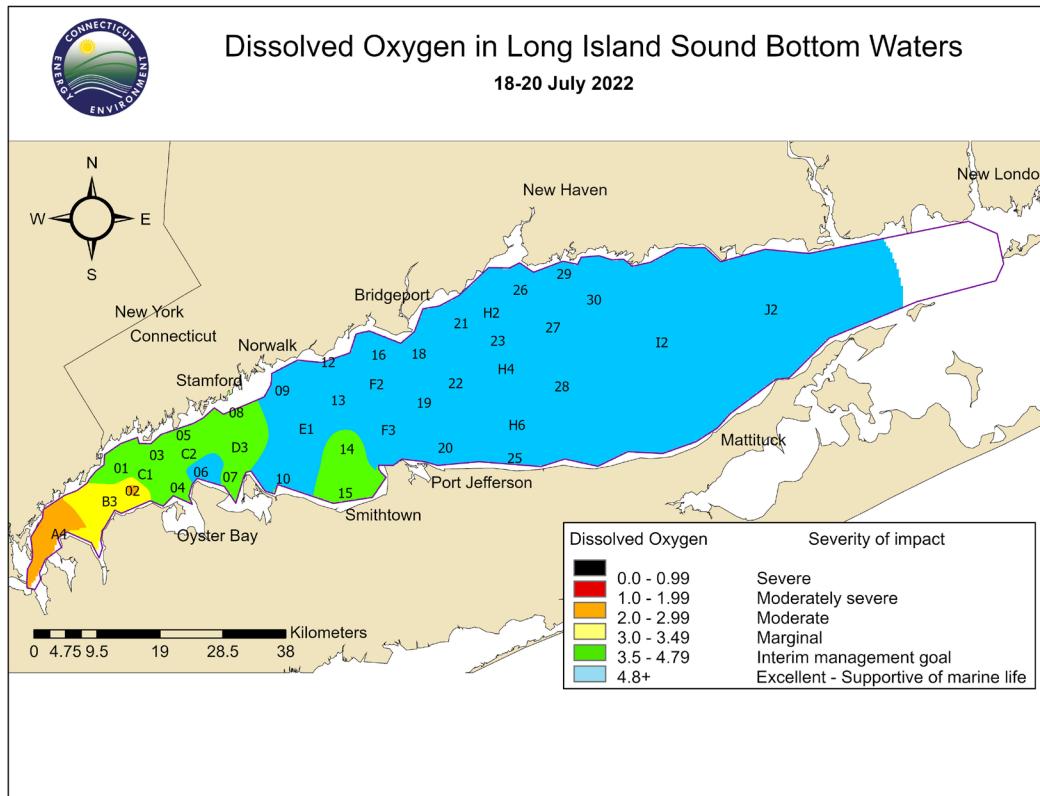


Table 1. Minimum Dissolved Oxygen Concentrations and Areal Estimates for HYJUL Cruises Conducted from 1998-2022 by CT DEEP.

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> )
HYJUL98	2.3	15	886.0	86.3
HYJUL99	2.06	A4	1231.8	58.5
HYJUL00	1.27	C1	1342.7	446.9
HYJUL01	2.81	A4	917.1	47.9
HYJUL02	1.8	B3	1702.8	160.2
HYJUL03	2.09	A4	1121.7	175.1
HYJUL04	3.06	A4	1342.1	0
HYJUL05	1.41	A4	1245.5	157.4
HYJUL06	2.83	A4	349.8	66.7
HYJUL07	2.11	A4	823.9	129.9
HYJUL08	0.68	A4	676.5	58.6
HYJUL09	2.43	B3	1030.3	72.8
HYJUL10	1.66	A4	669.3	109.3
HYJUL11	2.5	A4	1110.7	36.2
HYJUL12	1.9	A4	1250.6	126.9
HYJUL13	2.33	C1	671.0	44.8
HYJUL14	3.61	02	148.2	0
HYJUL15	2.12	A4	554.6	76.2
HYJUL16	2.44	A4	684.4*	49.2
HYJUL17	2.14	02	1306.2	181.1
HYJUL18	3.70	A4	234.6	0
HYJUL19	2.47	A4	465.7	46.1
HYJUL20	2.09	A4	1476.9	144.4
HYJUL21	3.27	A4	522.7	0
HYJUL22	2.77	A4	401.9	48.6

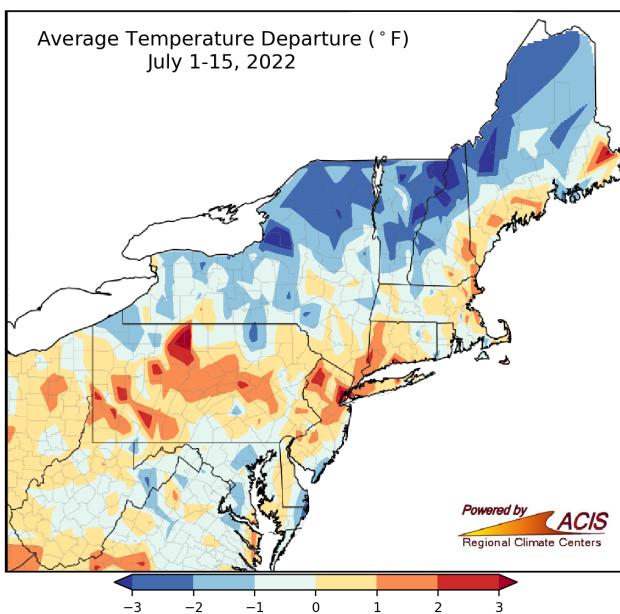
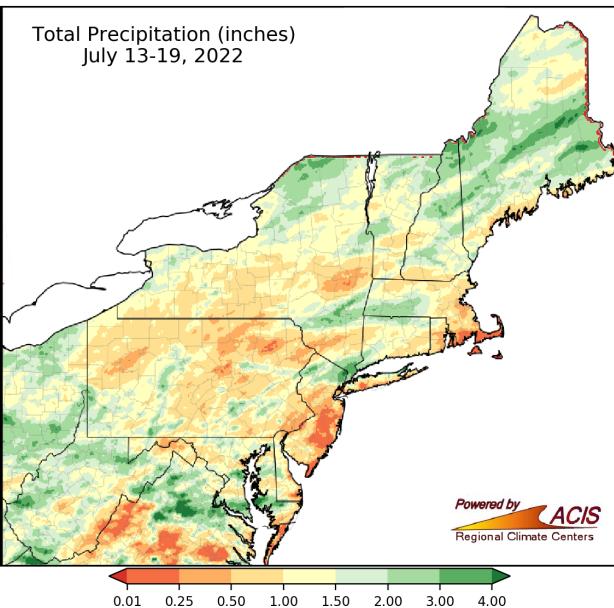
\*area underestimated due to CTD battery failure

New York, Connecticut, and Massachusetts saw below normal rainfall during July. In comparison with previous years, this July had cities reaching some of their driest months recorded thus far. Taking a closer look at conditions within Connecticut, it was observed that Bridgeport ranked July 2022 as the driest to have ever been recorded. Bridgeport received 0.05 inches, which is only 3% of the normal (1.49 in). Hartford, CT was also drier than normal, receiving 1.43 in of precipitation in early July. New York saw similar trends, with Kennedy Airport and LaGuardia Airport ranked as the 6<sup>th</sup> and 8<sup>th</sup> driest July on record, respectively.

Temperatures during the first half of July were generally warmer than past years around Long Island Sound. This July 1-15 period ranked as the 13<sup>th</sup> warmest on record at LaGuardia Airport, NY and 17<sup>th</sup> warmest at Bridgeport, CT. Average temperatures were slightly (0.3-0.6 °F) above normal across CT.

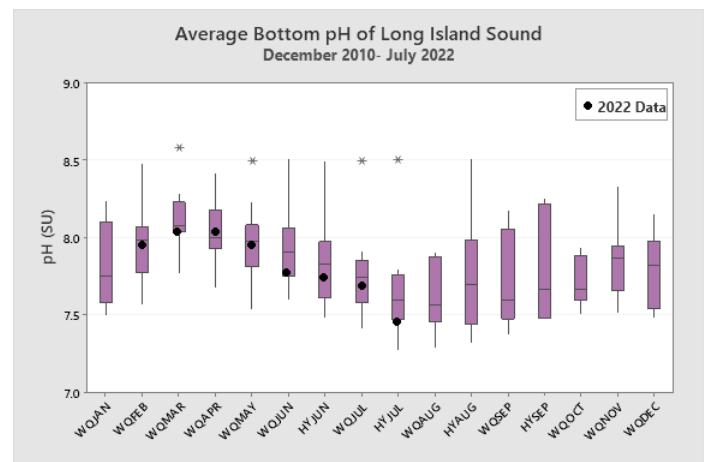
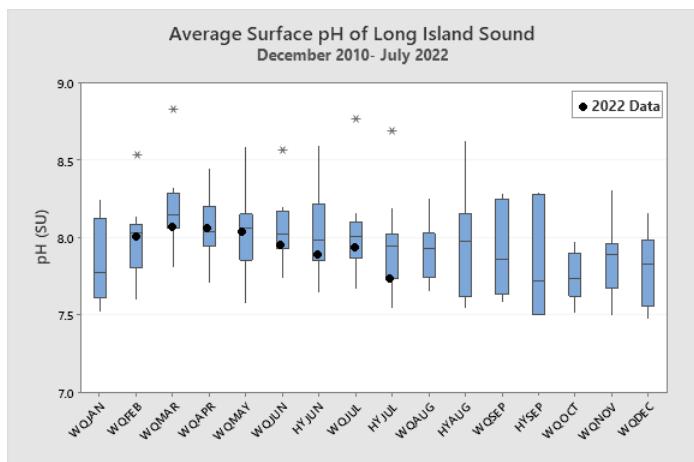
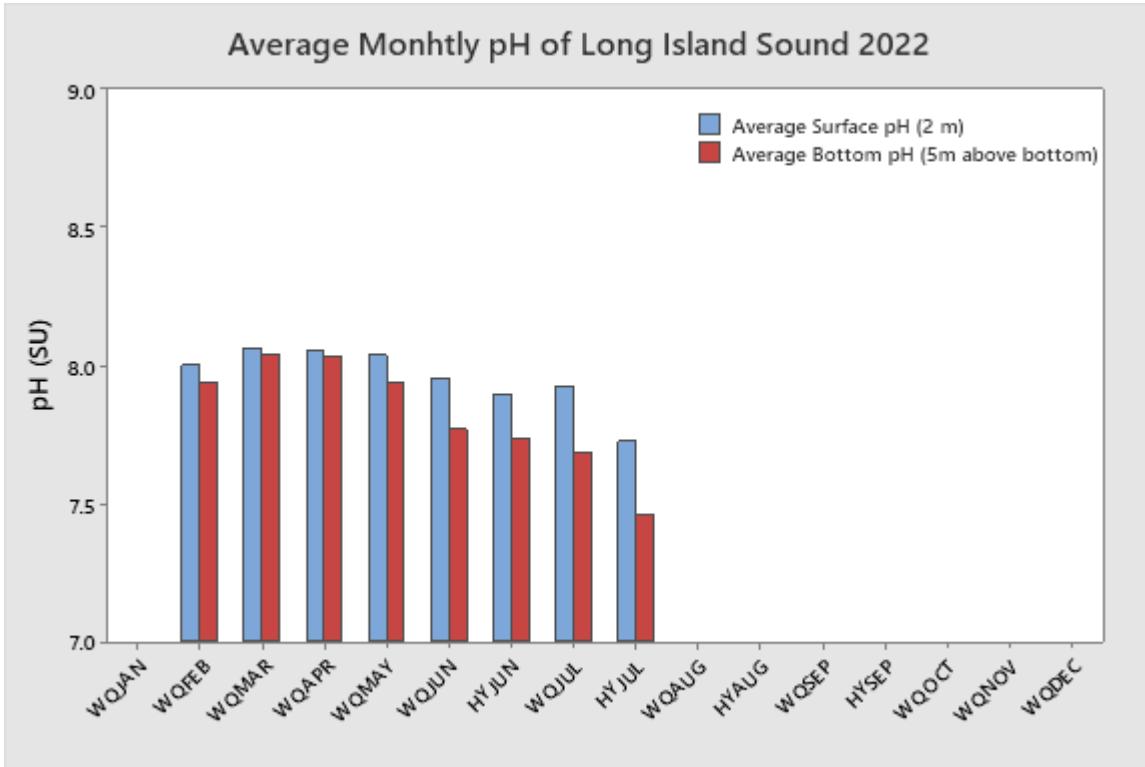
More detailed weather information can be viewed on the Northeast Regional Climate Center's website.

<https://www.nrcc.cornell.edu/services/blog/2021/07/16/index.html>



The average surface and bottom pH from all the stations across LIS during the HYJUL22 survey were 7.73 and 7.47 SU, respectively. The lowest bottom pH was 7.22 (Station A4), the highest bottom pH was 7.67 (Station 30), the lowest surface pH was 7.47 (Station 09), and the highest surface pH was 7.95 (Station 02).

The average surface and bottom pH graphs for all the cruises from 2010 to date only include the 17 year-round water quality stations.

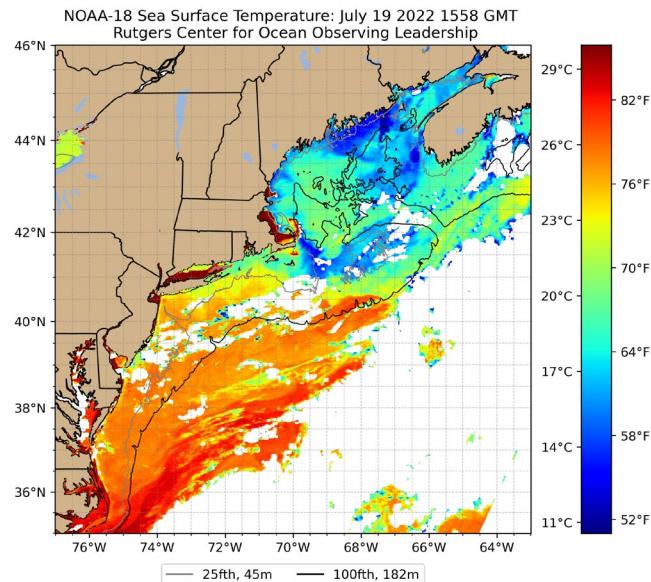


# Temperature

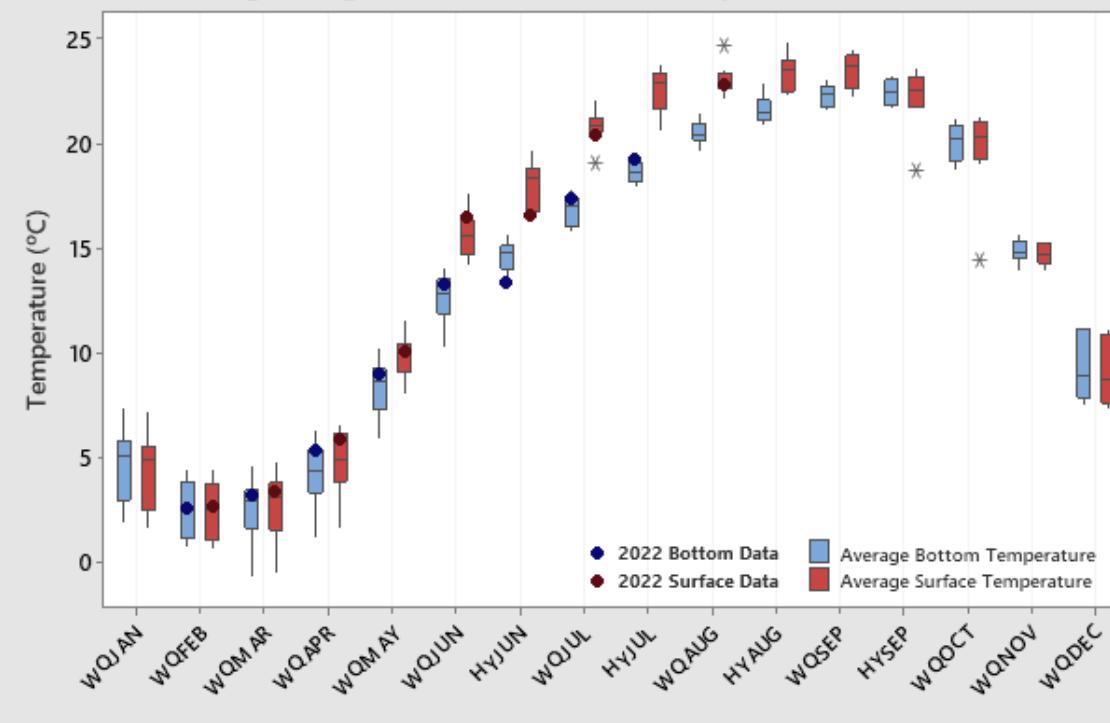
For the HYJUL22 survey, water temperatures averaged 22.66°C for surface waters and 19.17 °C for bottom waters. The surface waters were slightly cooler (-0.36°C) this year than during the HYJUL21 survey. The bottom waters were also cooler (-0.22°C) than in 2021.

The warmest surface temperature recorded was 24.49°C at Station 30, the warmest bottom temperature recorded was 21.15°C at Station 09, and the warmest near bottom temperature was 21.92°C at Station 16.

The difference between the surface and the bottom waters at each station ( $\Delta T$ ) ranged from 0.36°C (Station J2) to 4.87°C (Station 27) and averaged 3.21 °C.



## Average Long Island Sound Water Temperatures 2013-2022



# Secchi Disk Depths

Suspended solids, organic matter, phytoplankton, and zooplankton can all reduce water clarity, a measure of how much light penetrates the water column. To assess the water clarity across Long Island Sound, a Secchi disk is lowered into the water at each station until it can no longer be seen.

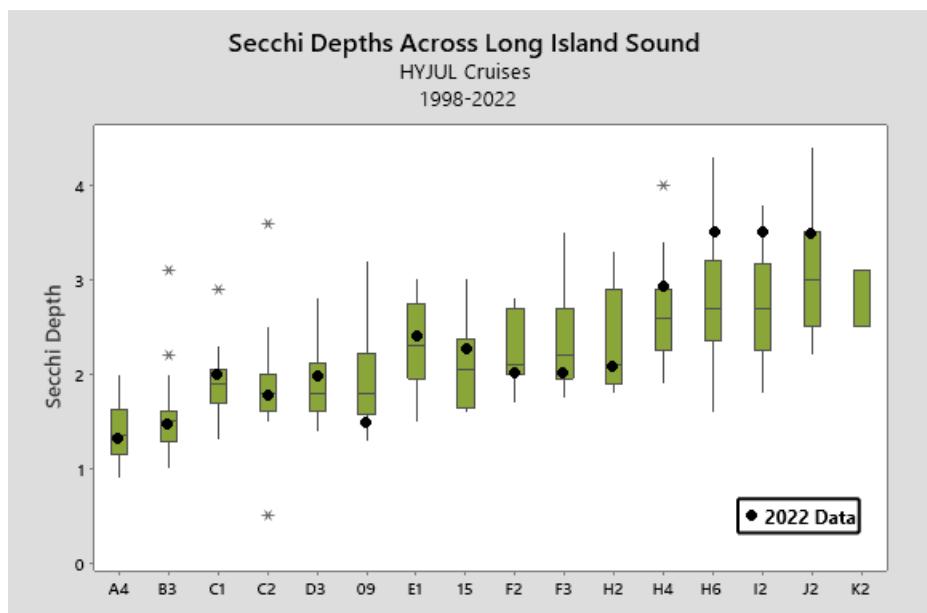
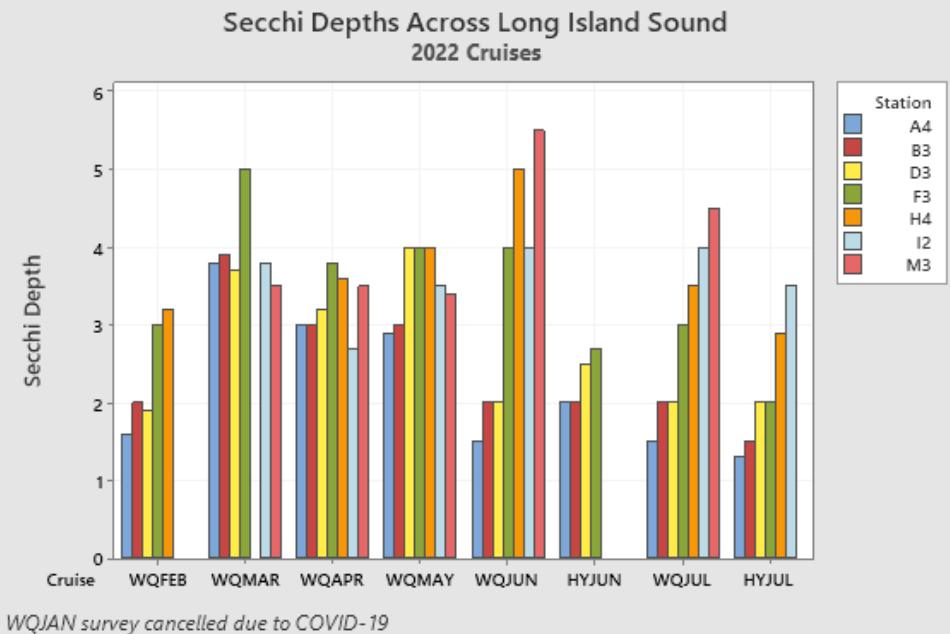
The [Long Island Sound Report Card](#) developed by Save the Sound utilizes the following water clarity depth thresholds based on the Secchi depth:

1.  $>2.28\text{m}$  (90-100)
2.  $2.12$  to  $<2.28$  (80-89)
3.  $1.95$  to  $<2.12$  (70-79)
4.  $1.8$  to  $<1.95$  (60-69)
5.  $0$  to  $<1.8$  (<60)



Secchi depths were taken at 40 stations during the HYJUL22 survey; these depths ranged from 1.3 meters (Station A4) to 3.5 meters (Stations H6, J2, and I2).

In Report Card terms, 17 stations were in the A-range ( $>2.28\text{m}$ ), 0 stations were in the B-range (2.12 to  $<2.28\text{m}$ ), 14 stations were in the C-range (1.95 to  $<2.12\text{m}$ ), 5 stations were in the D-range (1.8 to  $<1.95\text{m}$ ), and 4 stations failed ( $<1.8\text{m}$ ).



## Next Survey

The next survey is scheduled for 1-3 August (WQAUG22) aboard the R/V John Dempsey. The schedule for the remainder of 2022 is available on our website.



Connecticut Department of  
**ENERGY &  
ENVIRONMENTAL  
PROTECTION**