

September 2021

HYSEP21 Summary

[Volume 4, Issue 8]



Long Island Sound Water Quality Monitoring Program

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

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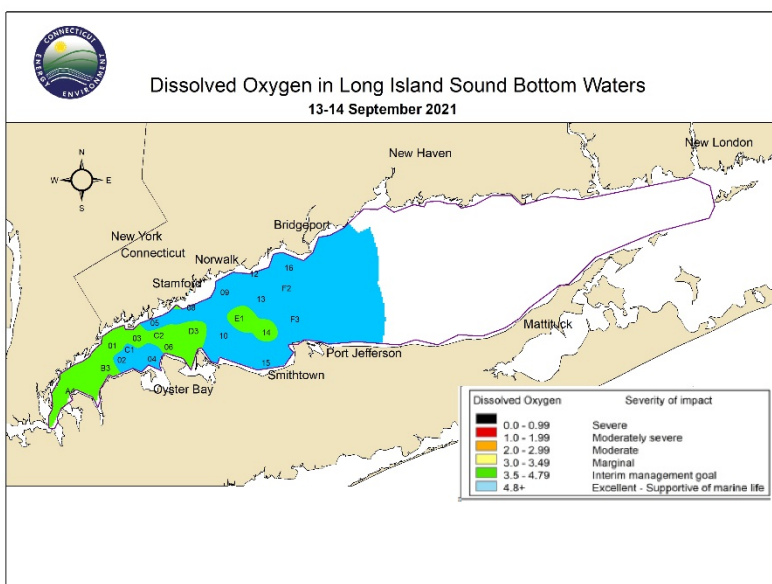
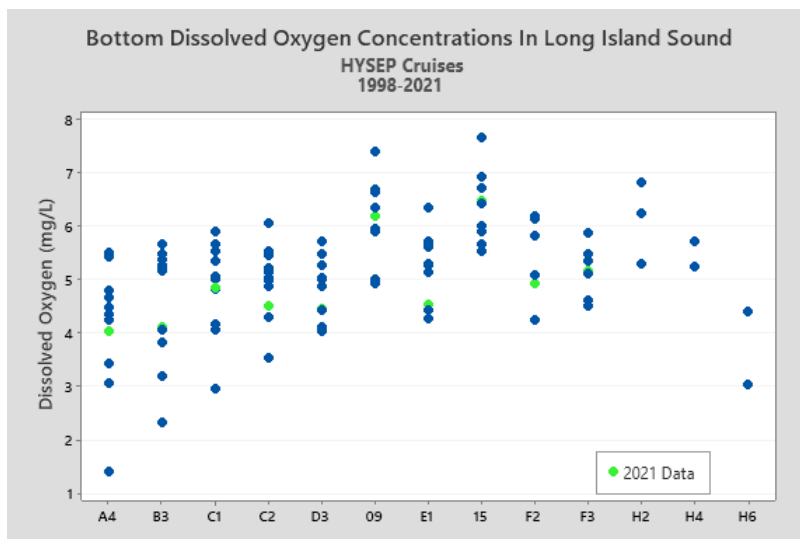


Table 1. Minimum Dissolved Oxygen Concentrations and Areal Estimates for HYSEP Cruises Conducted from 1998-2021 by CT DEEP.

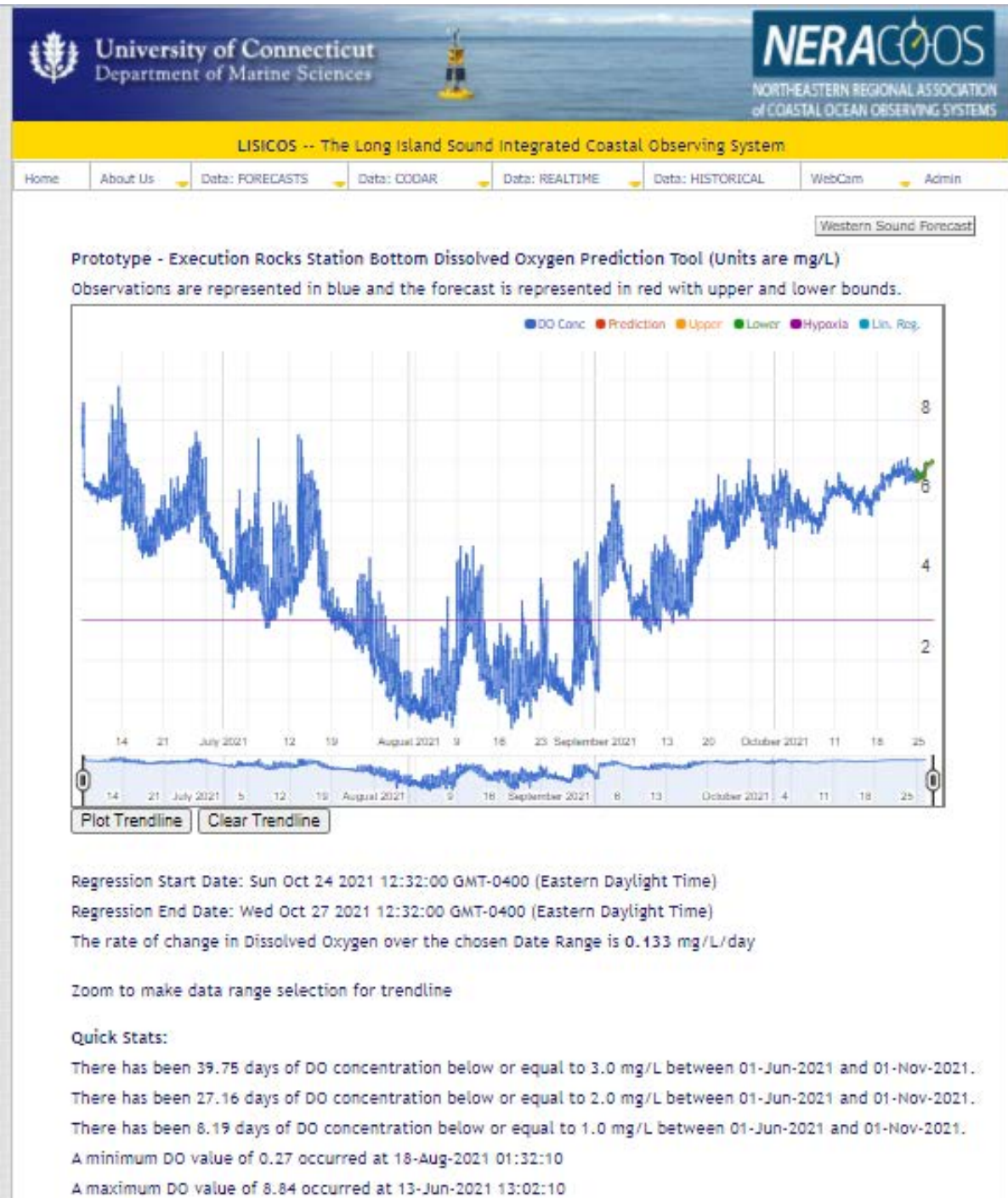
Cruise	Minimum DO Observed (mg/L)	Station with Minimum DO	Area under 4.8 mg/L (km ²)	Area under 3 mg/L (km ²)
HYSEP98	3.06	A4	403.8	0
HYSEP01	3.43	A4	193.3	0
HYSEP08	1.42	A4	637.1	141.9
HYSEP12	4.66	A4	28.3	0
HYSEP13	3.2	B3	371.2	0
HYSEP14	4.39	H6	59.7	0
HYSEP15	4.24	A4	36.9	0
HYSEP16	3.06	H6	144.9	0
HYSEP18	4.78	A4	20.4	0
HYSEP19	4.99	14	0	0
HYSEP21	4.02	A4	286.4	0

All Stations above 4.0 mg/L

CT DEEP sampled 20 stations during the HYSEP21 survey that was conducted on 13 and 14 September 2021. The lowest dissolved oxygen (DO) recorded during this survey was at Station A4 with a concentration of 4.02 mg/L. There were an additional eight (8) stations below 4.8 mg/L. There were 286.4 km² of bottom water with DO concentrations below 4.8 mg/L. Data are available in an Excel spreadsheet format and on the [UCONN ERDDAP site](https://portal.ct.gov/DEEP-LIS).

The DO at Station A4 during HYSEP surveys from 1998-2019 (n=10) ranged from 1.42 mg/L (HYSEP08) to 5.49 mg/L (HYSEP14). The average DO at A4 during the HYSEP surveys (n=11) is 4.12 mg/L (+/- 1.157mg/L) and the median is 4.34 mg/L.

Dissolved Oxygen



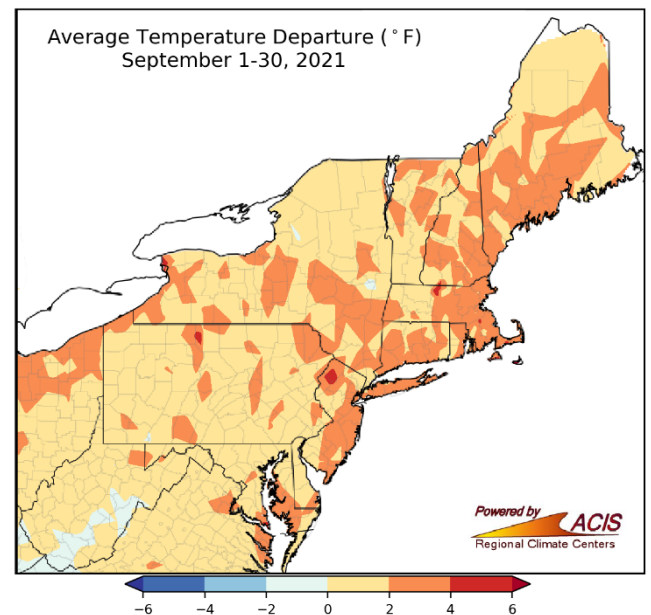
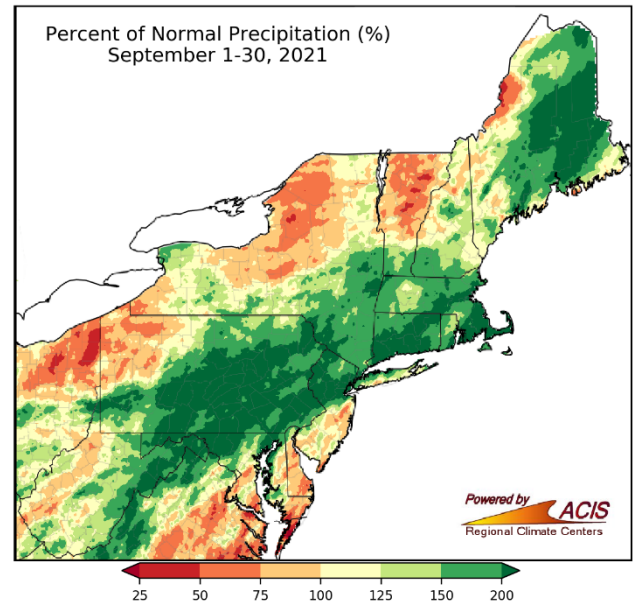
The above graph shows the DO concentrations as recorded by the UConn LISICOS Buoy at Execution Rocks, which corresponds to CT DEEP's Station A4, from 14 July to 25 October. During the HYSEP21 cruise, CT DEEP recorded the DO at Station A4 as 4.02 mg/L. For the WQSEP21 cruise completed August 30- September 1, the DO at Station A4 was 3.23 mg/L.

The buoy recorded DOs that remained below 3.0 mg/L (hypoxic) from August 20 through September 1. DO's then went above 3.0 where they remained until September 9 where concentrations hovered above and below the 3.0 mg/L mark through September 12. Since then, the DO has remained above 3.0 mg/L.

This year, the HYSEP21 survey which was conducted on the 13th and 14th of September. Multiple storm systems traversed the area during the month of September resulting in record high precipitation. These systems along with Tropical Storm Ida earlier in the month made this one of the wettest Septembers on record. Bridgeport, CT recorded 8.39in. (212% above normal) of precipitation which made it the 2nd wettest September recorded for the area. LaGuardia Airport, NY was also affected and received 8.75in. (226%) of precipitation making September its 4th wettest on record.

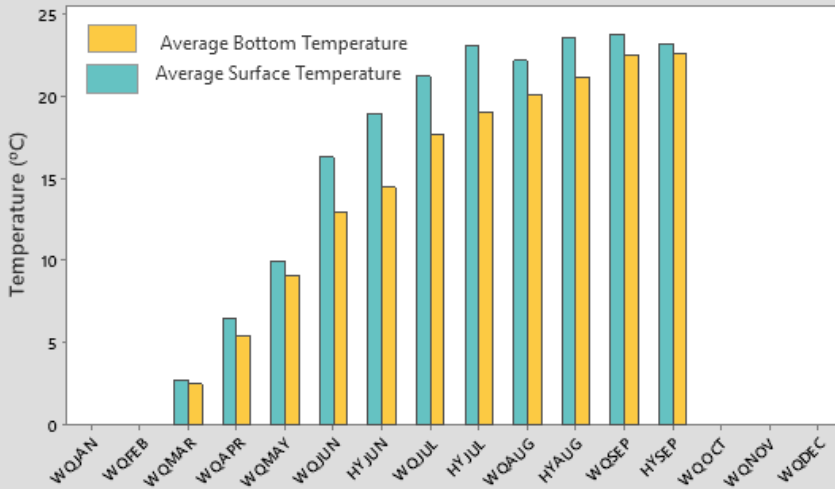
The temperature departure within the month of September was approximately 4°F above normal within the Northeast region. Areas such as Bridgeport, CT had a temperature departure of 2.2°F with an average temperature of 69.8°F, ranking September 2021 as the 5th warmest recorded. LaGuardia Airport, NY had an average temperature of 72.7°F with a departure of 1.9°F. For LaGuardia, NY, this September was ranked 7th warmest.

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



Water Temperature

Average Monthly Temperature of Long Island Sound
2021



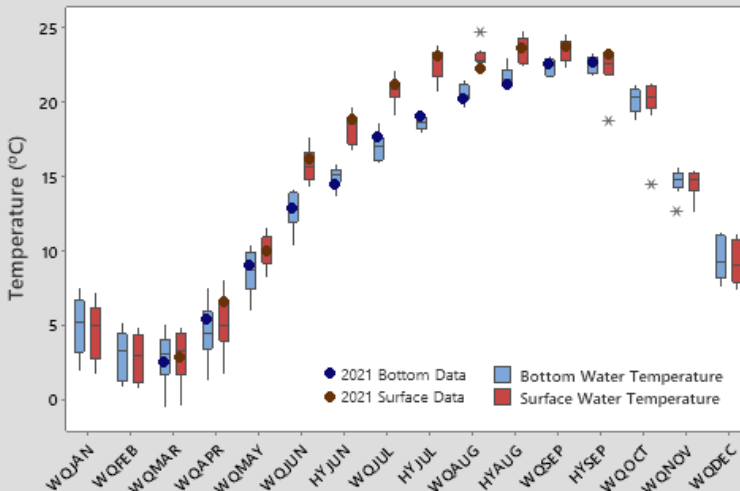
Water temperatures began to decline throughout the Sound as this summer comes to an end.

The average surface water temperature (22.54°C) dropped 0.87°C while the average bottom water temperature (22.95°C) dropped 0.22°C from the WQSEP21 survey.

The maximum surface temperature during the HYSEP21 survey occurred at Station A4 (25.08°C) while the maximum bottom temperature occurred at Station 04 (22.91°C).

ΔT values ranged from 0.03°C (Station 16) to 2.50°C (Station A4), and the average ΔT was 0.42°C, a decrease of 0.69°C from WQSEP21 (1.11°C) and an even larger decrease of 1.81°C from HYAUG21 (2.23°C).

Average Long Island Sound Water Temperatures
2012-2021

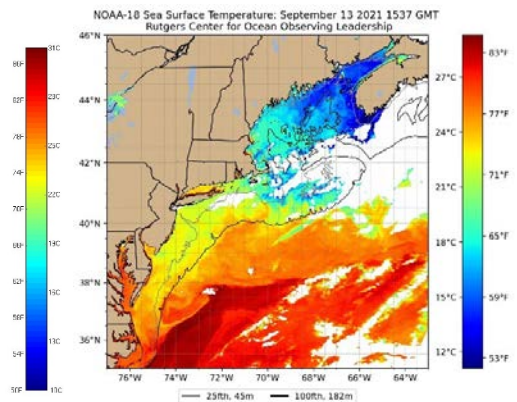
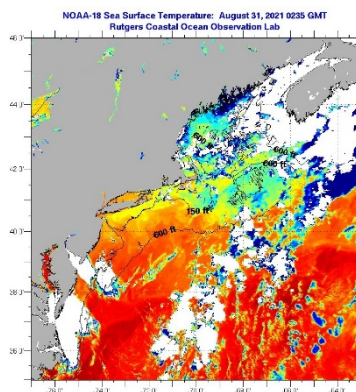


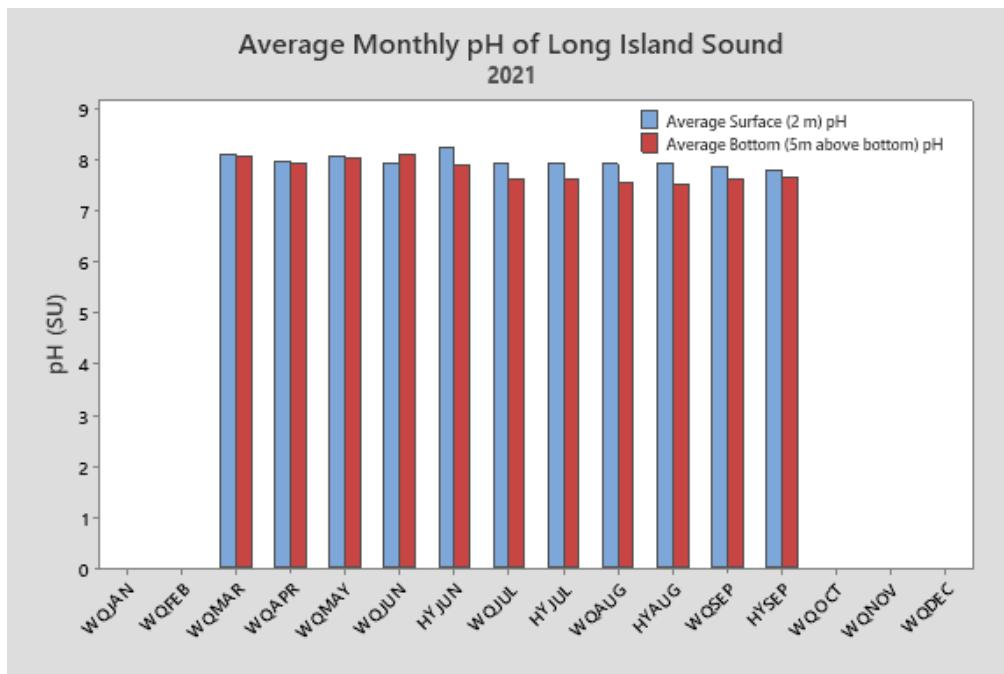
Note: The surface and bottom water temperatures graphed reflect data from only the 17 year-round water quality stations.

Sea surface temperature (SST) data from Rutgers University illustrate how currents and fronts impact water temperatures in Long Island Sound and offshore.

The two images shown here are from the middle of the WQSEP21 survey (30 Aug, left) and the day first day of the HYSEP21 survey (13 Sep, right). Over the two-week timeframe, water in the Gulf of Maine and Georges Bank has cooled and continued to flow south into, and beyond, LIS.

More information about sea surface temperature can be found on the Rutgers ICMS – Coastal Ocean Observation Lab [website](#).

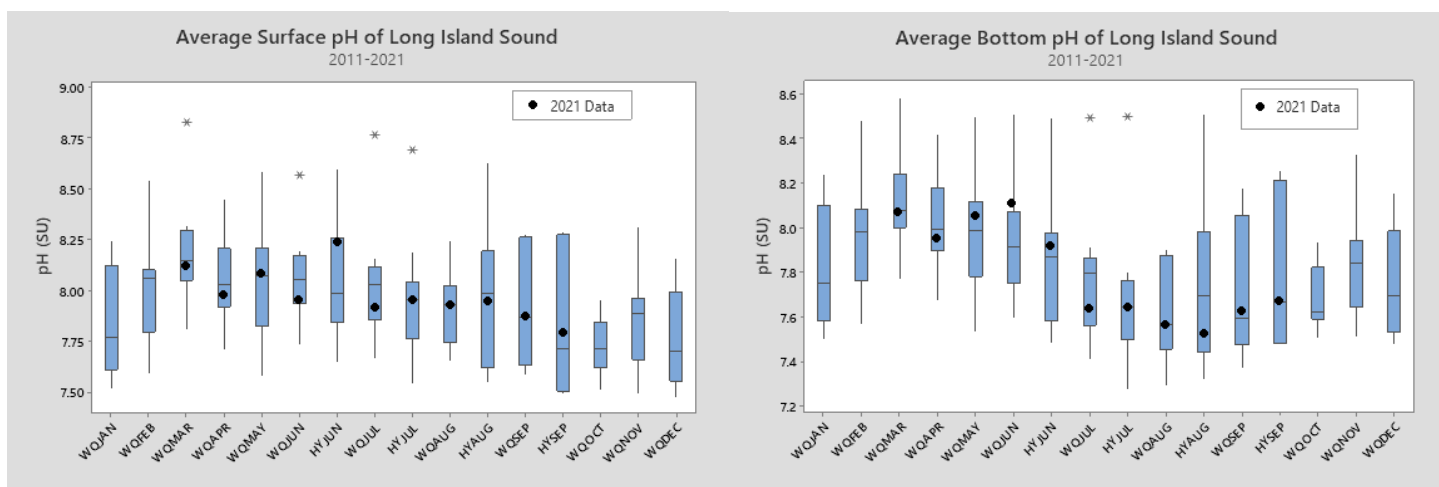




During the HYSEP21 survey, Station 14 had the lowest surface (7.46 SU) while Station F3 had the highest surface pH (8.07 SU). The highest bottom pH was recorded at Station 15 (7.79 SU) while the lowest bottom pH was measured at Station A4 (7.52 SU).

The surface pH averaged 7.75 SU and the bottom pH averaged 7.67 SU during the HYSEP21 survey. The mean surface and bottom values for HYSEP surveys from 2011 to 2021 are 7.825 and 7.772 SU, respectively.

Note: The surface and bottom pH graphs reflect data from only the 17 year-round water quality stations.

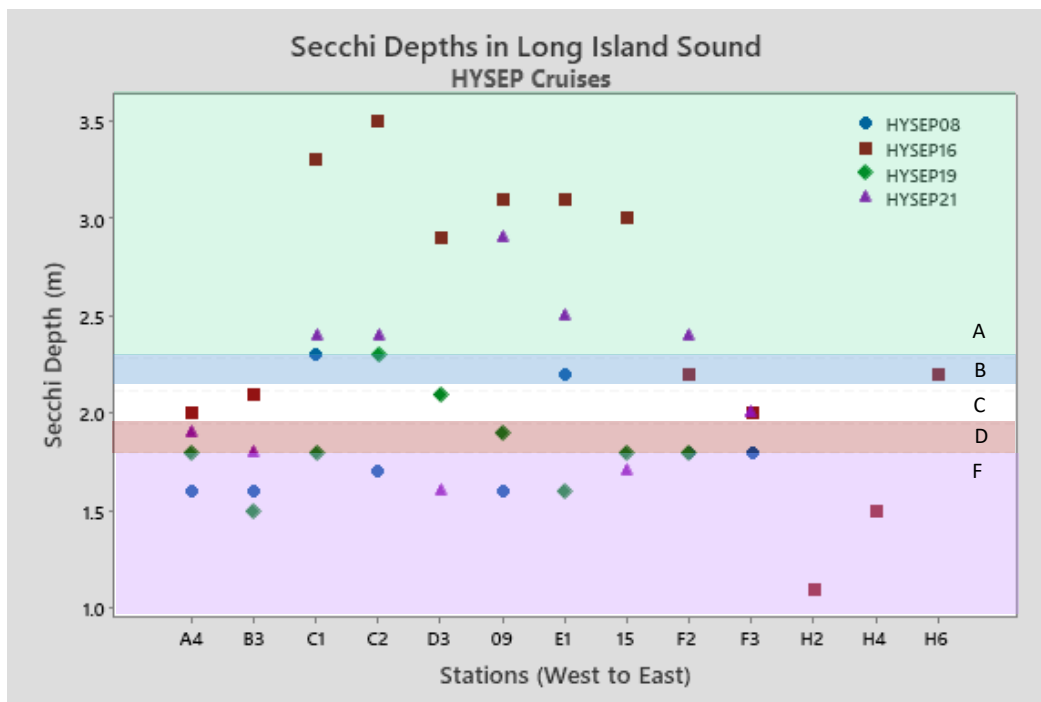


Secchi Disk Depths

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 depths are collected at each station. A Secchi disk is a black and white disk that 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.

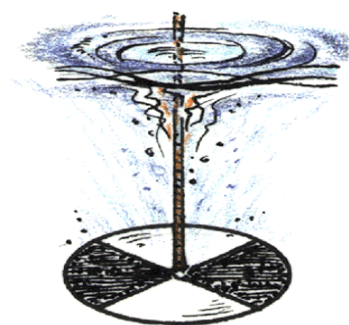
Secchi depths were taken at 22 stations during the HYSEP21 survey; these depths ranged from 1.6 meters (Stations D3) to 2.9 meters (Station 09). The average was 2.2 meters.



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) (in the graph above, the green area)
2. 2.12 to <2.28 (B- to B+; 80-89) (blue)
3. 1.95 to <2.12 (C- to C+; 70-79) (white)
4. 1.8 to <1.95 (D- to D+; 60-69) (red)
5. <1.8 (F; <60) (purple)

Of the 22 Secchi depths measured during this survey (not all depicted on the graph above), 11 were in the A-range, 1 was in the B-range, 5 were in the C-range, 3 were in the D-range, and 2 failed.





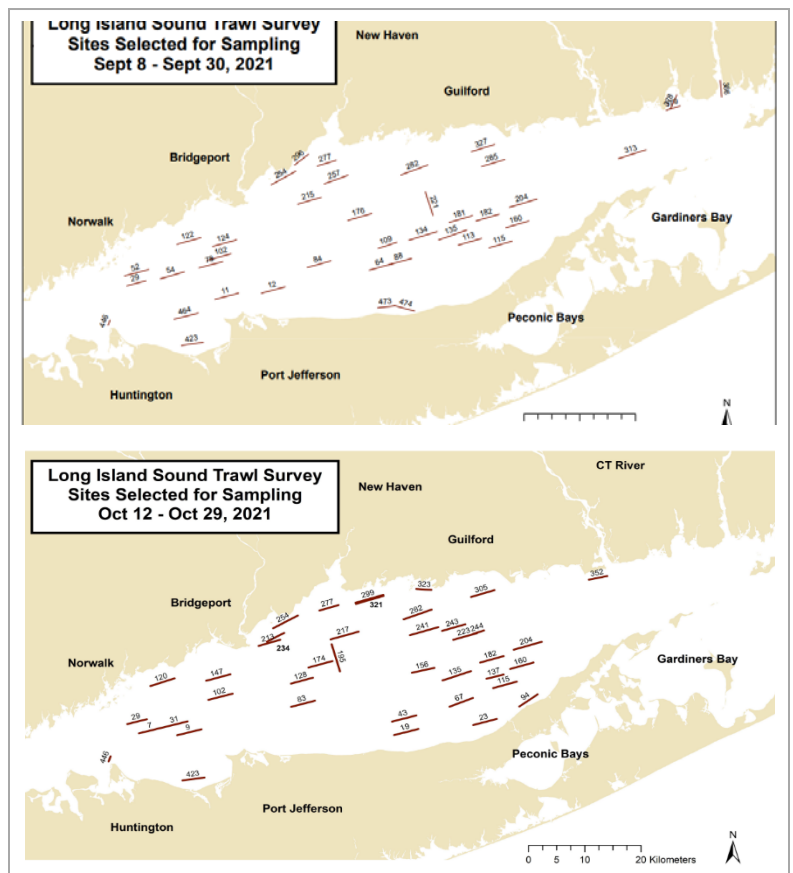
SPOTLIGHT!

Long Island Sound Trawl Survey

The Fall Long Island Sound Trawl Survey (LISTS) is underway! Each spring and fall CT DEEP's Marine Fisheries biologists use the R/V John Dempsey to sample 40 randomly selected sites across LIS (Greenwich to Groton in both CT and NY waters). Stations encompass 12 depth and substrate categories. The survey measures the abundance and distribution of finfish and select macroinvertebrate species such as squid, lobster, horseshoe crabs, and whelks. A 46-foot sweep trawl net is deployed for 30 minutes at each site. Once retrieved, the catch is quickly sorted by species, counted, measured, and weighed. Specimens not needed for specific research (e.g., aging) are returned to the Sound unharmed.

The Long Island Sound Trawl Survey was not conducted in 2020 due to the Covid-19 pandemic. In 2021, the survey resumed in May. (April of the spring survey was not conducted.) Thirty-three (33) sites were completed in both May and June, for a total of 66 tows in the spring 2021 survey. By weight scup were the most abundant. Also abundant were smooth dog fish, striped sea robin, black sea bass, northern sea robin. Summer flounder catches were notable due to strong catches across their size range and throughout Long Island Sound.

The 2021 Fall Survey was completed with a total of 73 tows conducted, 40 in September and 33 in October. Catches throughout the fall were consistently light with only a few large tows of scup. Scup, smooth dog fish and butterfish dominated the fall catches. Notable were the catches of clearnose skate, summer flounder, hog choker and American shad. Also catches of medium to larger weakfish were consistent with what was being seen in the recreational fishery.



Juvenile Northern Stargazer- Caught in Long Island Sound, the northern most extent of their range. They possess an organ on their heads that can deliver an electric charge that stuns and confuses prey and helps ward off predators.

Next Survey

Our next survey is scheduled for 4-6 October (WQOCT21) aboard the R/V John Dempsey.
The schedule for the remainder of 2021 is available on our website.
This is the last hypoxia newsletter for the 2021 season.



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