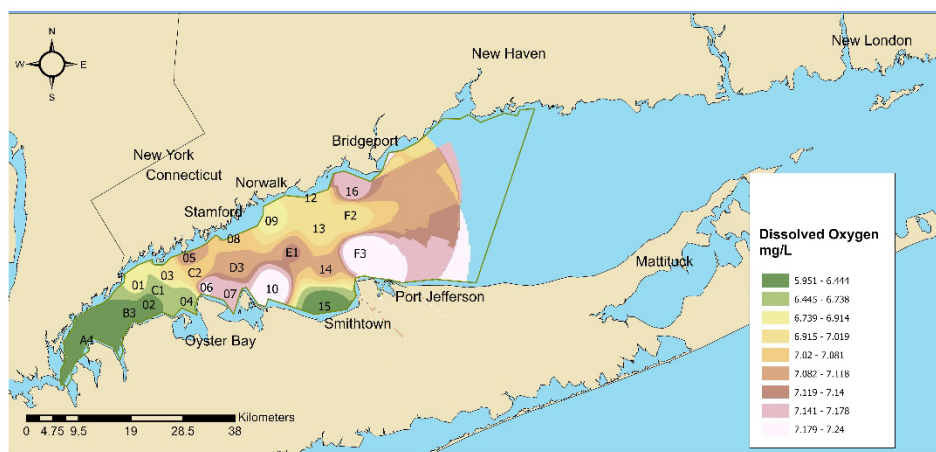




Dissolved Oxygen in Long Island Sound Bottom Waters

14 June, 2022



Long Island Sound Water Quality Monitoring Program

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

79 Elm Street
Hartford, CT 06106
(860) 424-3176
Katie.obrien-clayton@ct.gov

HYJUN22 Water Quality Summary

Dissolved Oxygen Concentrations Still Near 6 mg/L

The Connecticut Department of Energy and Environmental Protection conducted our HYJUN22 survey on June 14, 2022, aboard the R/V Patricia Lynn. Dissolved oxygen concentrations in the bottom waters of Long Island Sound remained near 6 mg/L throughout the survey.

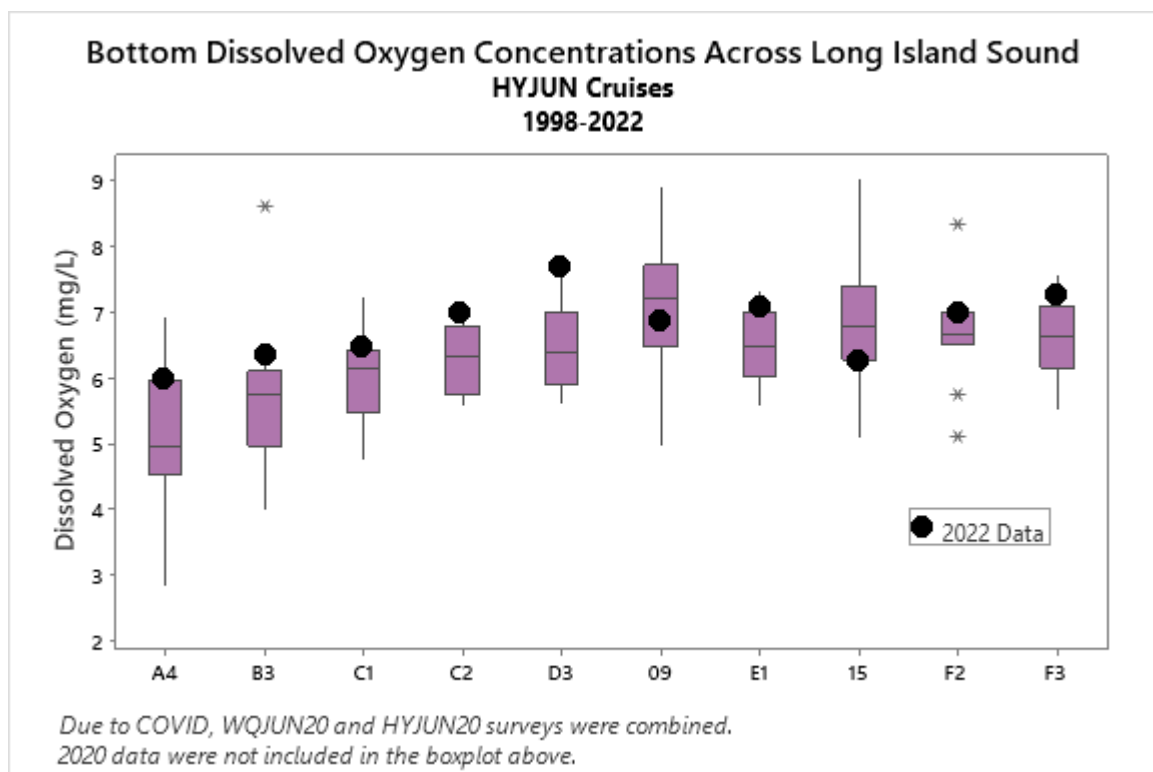
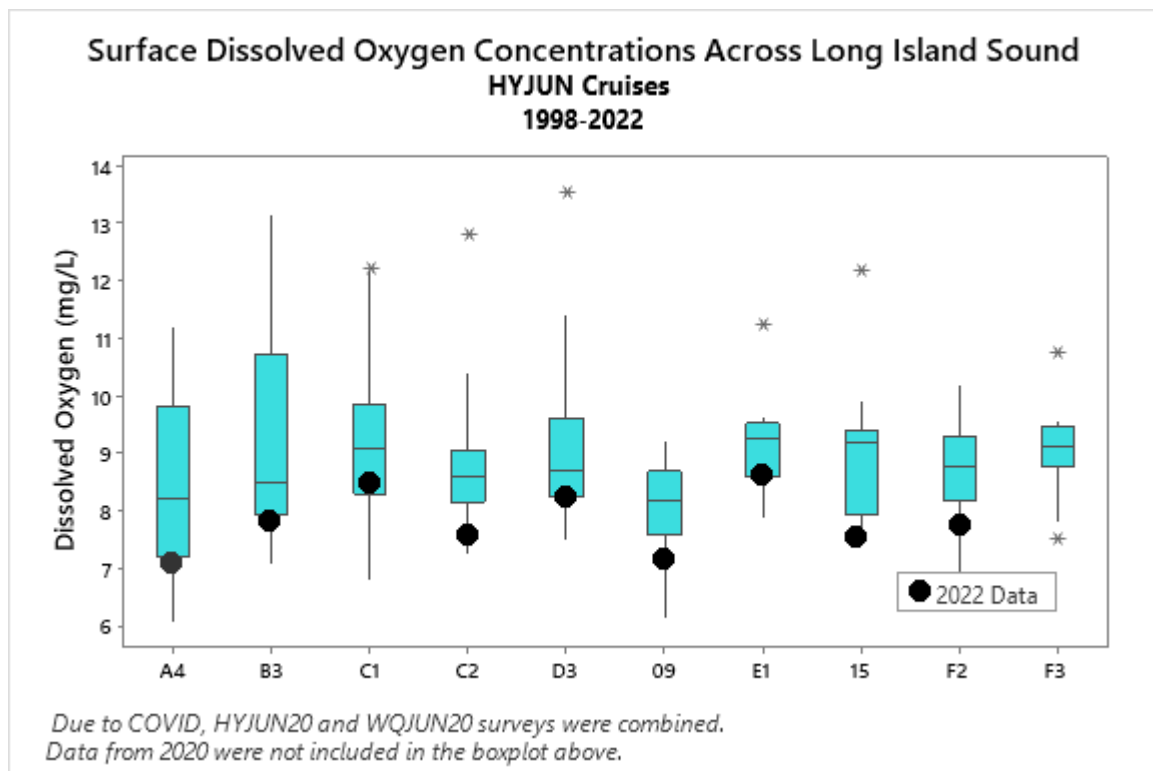
The lowest concentration measured during the survey was 5.95 mg/L at Station A4, a 1.13 mg/L decrease from WQJUN22. Of the 16 measurements recorded at Station A4 between 1996 and 2022, the median concentration was 4.95 mg/L with a range of 2.94 mg/L (2004) to 7.16 mg/L (2019). Leading up to the HYJUN21 survey, A4 had concentrations of 9.16 mg/L in May and 7.08 mg/L in early June.

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

Contents

Dissolved Oxygen	2
Weather	3
Temperature	4
Delta T (ΔT)	5
Salinity	6
Sampling Schedule	7

Dissolved Oxygen



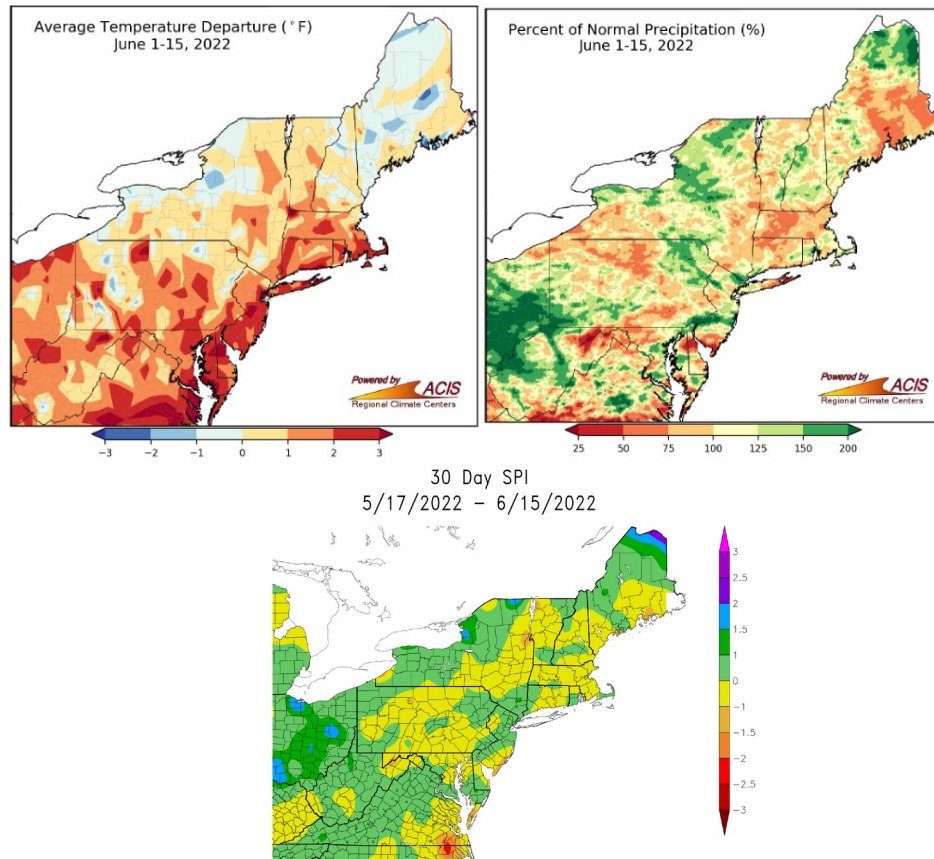
Weather

June 2022 temperatures were moderately above normal, with the regional climate locations of Islip and Bridgeport reporting June 1-15, 2022 as the 9th and 11th warmest on record, respectively. Bridgeport and New York City locations were about 1 °F above average while Hartford and Islip were around 2°F above normal. Precipitation from June 1-15 was also moderately below normal across the LIS region. Islip and Bridgeport received around 58% of the normal precipitation for the month. Hartford and New York City were less dry, receiving about 86% of its normal precipitation.

Weather during the survey was partly cloudy. Seas were generally calm.

The Standardized Precipitation Index (30-day SPI) graphic below depicts precipitation patterns throughout the Northeast region based on a 30-day model of variable sources of moisture (i.e., Precipitation, groundwater, and soil moisture). A negative index indicates dry conditions, and a positive index indicates wet conditions; the LIS Watershed was slightly dryer than normal.

Climate information can be viewed on the Northeast Regional Climate Center's website <http://www.nrcc.cornell.edu/>.

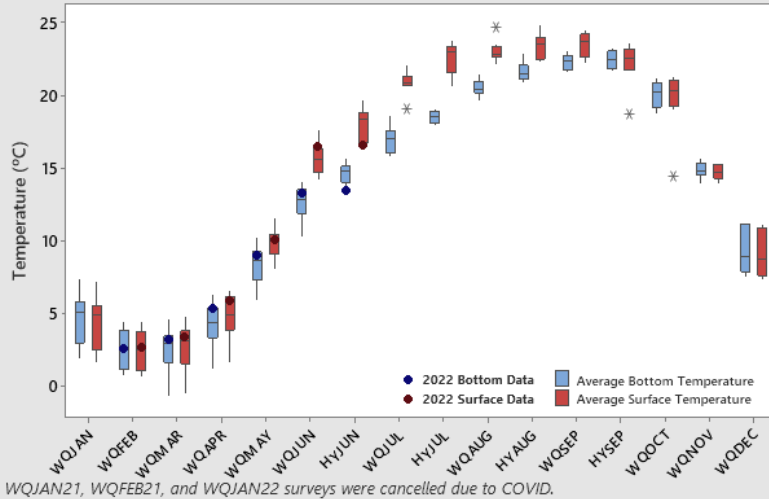


Generated 6/16/2022 at HPRCC using provisional data.

NOAA Regional Climate Centers

Temperature

Average Long Island Sound Water Temperatures 2013-2022

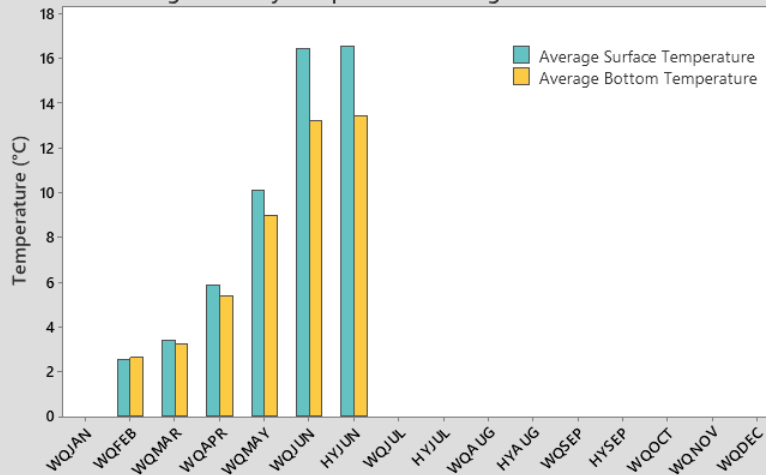


Bottom and surface water temperatures rose from WQMAY22 to WQJUN22 (with a 6.5°C jump for surface waters and a 4.5°C jump for bottom waters), but surface and bottom water temperature stayed consistent from the WQJUN22 to the HYJUN22 survey (only a 0.12°C jump for surface waters and a 0.20°C jump for bottom waters was observed).

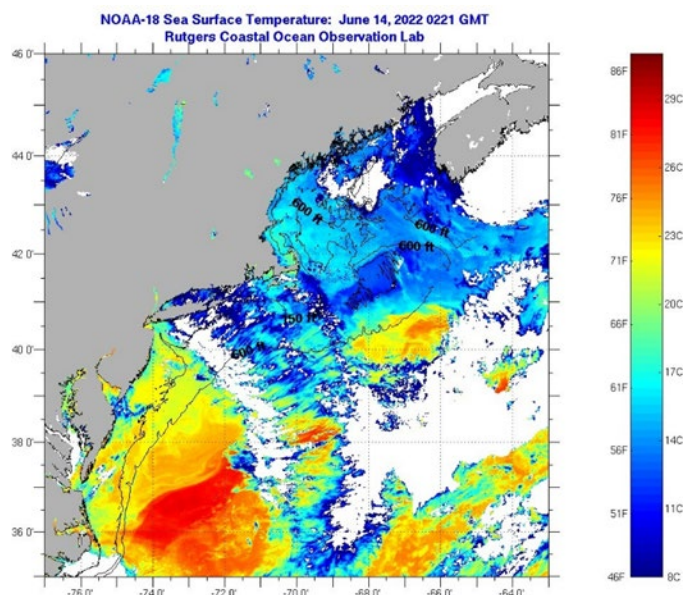
Average monthly temperatures in the surface waters during the HYJUN surveys for the ten-year period from 2013 -2022 ranged from $16.68\text{--}19.64^{\circ}\text{C}$ with an average temperature of 17.94°C . In the bottom waters temperatures ranged from $13.44\text{--}15.65^{\circ}\text{C}$ with an average temperature of 14.65°C . The average temperature of LIS waters was lower in 2022 than in the past 10 years. The 2022 average surface water recorded was 16.56°C and the average bottom temperature was 13.44°C .

The maximum bottom water temperature occurred at Station 10 (14.25°C) and the maximum surface water temperature occurred at Station E1 (19.45°C) during the HYJUN22 survey.

Average Monthly Temperature of Long Island Sound 2022

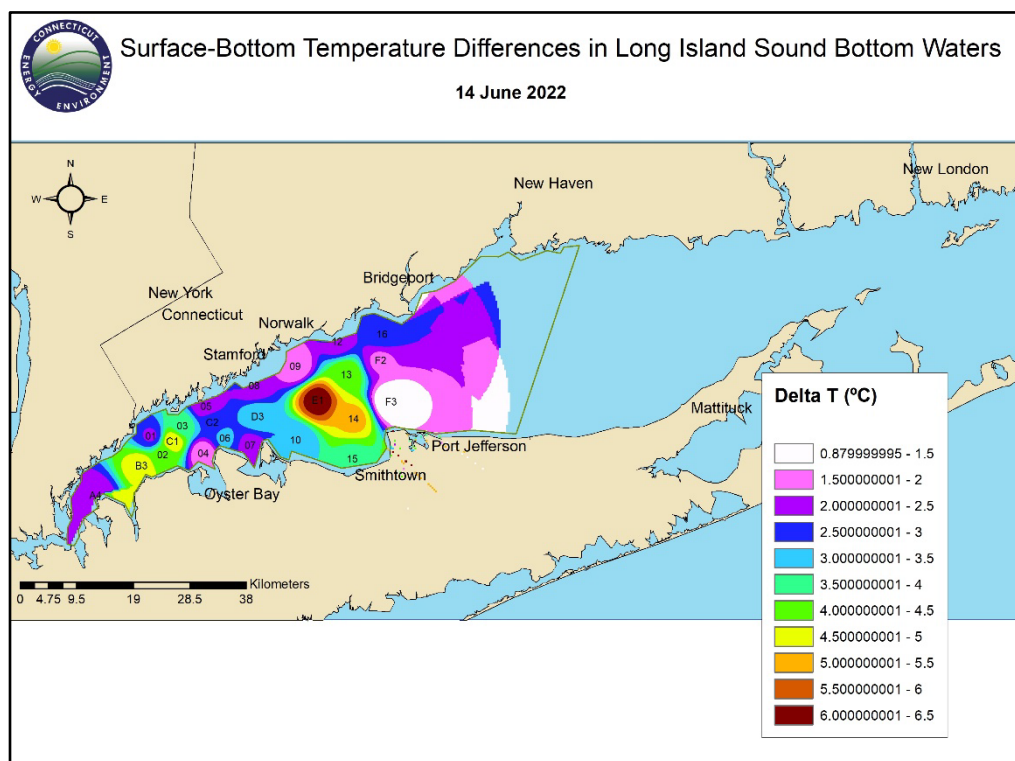


WQJAN22 survey cancelled due to COVID.



Be sure to check out the monthly webinar series from the Northeast Regional Climate Center where NOAA affiliates address timely weather and climate concerns:

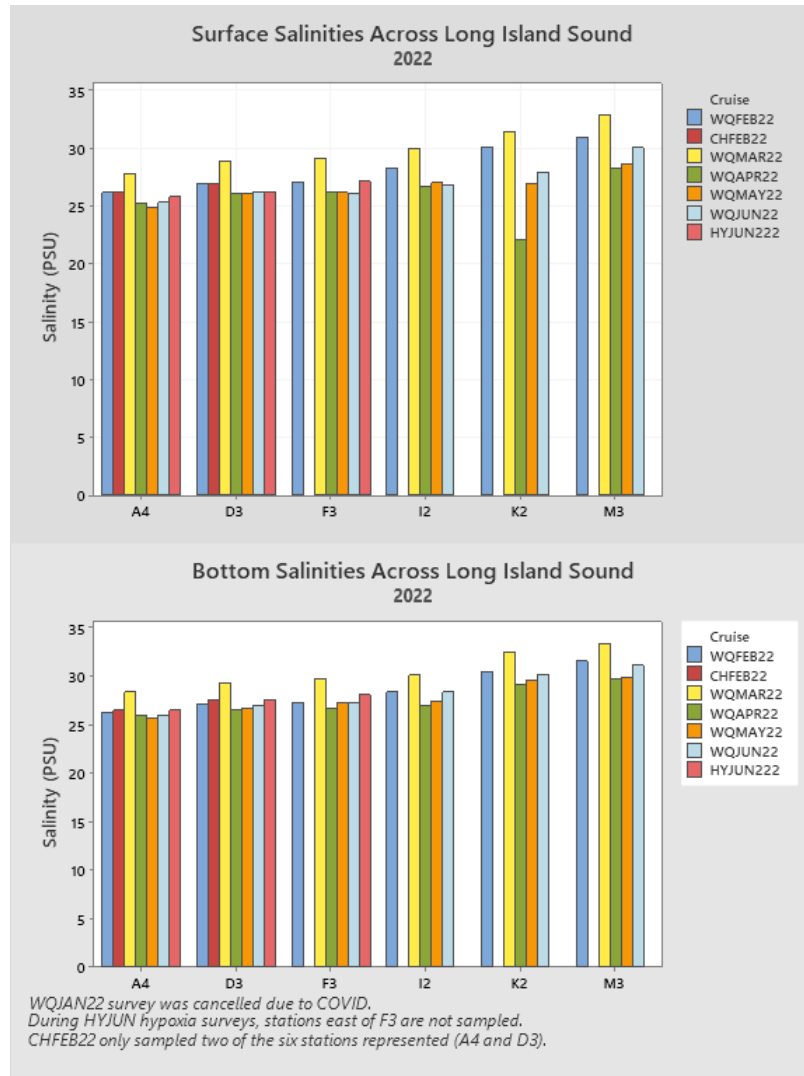
<https://www.nrcc.cornell.edu/workshops/webinars/2022/05/index.html>. The upcoming talk on June 30th will focus on ocean warming and the impacts it will have on marine environments.



Delta T (ΔT) is the difference between the surface and bottom water temperature. Differences in water temperature contribute to stratification and exacerbate hypoxic conditions. In general, the shallower coastal stations tended to have the smallest temperature differences, as they are more susceptible to mixing, weather, and anthropogenic influences (human caused Influences).

The greatest temperature difference between the surface and bottom waters during the HYJUN22 survey was 6.24°C, measured at Station E1. The smallest temperature difference was 0.88°C at Station F3.

For comparison, during the HYJUN18 survey the greatest ΔT was 6.50°C measured at Station E1. In 2018, ΔT 's continued to increase through the WQJUL survey before diminishing in the HYJUL survey. During the HYJUN19 survey, the greatest ΔT was 4.47°C measured at Station F2. During the hybrid WQ/HYJUN20 survey the greatest ΔT was 5.86°C measured at Station E1. During the HYJUN21 survey, the greatest ΔT was 6.41°C measured at Station F3.



Surface salinities across Long Island Sound generally decrease slightly from January through May due to snow melt and spring rains. The less dense freshwater will float on top of the denser saltwater contributing to stratification and impacting hypoxia. Additionally, nutrients carried by the runoff fuel phytoplankton growth. Surface and bottom water salinities in 2022 were constant across much of the western and central Sound, although salinities in March were slightly higher than other months. Interestingly, April surface salinity at station K2 was lower than other months, likely due to rain events and ice melt in the upper states discharging to the Connecticut River. Additionally, salinity increased slightly from April to June as precipitation events waned and drought conditions began to develop, especially in eastern Connecticut.

Surface and bottom salinity values during the HYJUN22 survey were above the 2009-2022 average for Stations A4, D3, and F3. (See table below).

	A4	D3	F3
2022 Surface	25.85	26.28	27.18
2009-2022 Average Surface	25.07	25.88	25.97
2022 Bottom	26.43	27.55	28.06
2009-2022 Average Bottom	25.82	26.85	27.13

The next survey is scheduled for 7/5-7/7 (WQJUL22) aboard the R/V John Dempsey. The schedule for the remainder of 2022 is also available on our website <https://portal.ct.gov/DEEP-LIS>.



Connecticut Department of
**ENERGY &
ENVIRONMENTAL
PROTECTION**