Environmental Quality in Connecticut



Chatfield Hollow State Park
Killingworth

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The 2024 Annual Report of the Council on Environmental Quality

STATE OF CONNECTICUT

COUNCIL ON ENVIRONMENTAL QUALITY

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May x, 2025

The Honorable Ned Lamont
Governor of Connecticut
State Capitol
Hartford, CT 06106

Governor Lamont:

The Council is pleased to submit *Environmental Quality in Connecticut* for 2024, as authorized by Connecticut General Statutes (CGS), Section 22a-12. The Council was established on June 25, 1971 by Public Act 872. This report uses over forty indicators of environmental health and human activity to illustrate environmental trends, both positive and negative, primarily for the 2024 calendar year. As required, the Council has also included recommendations for "remedying the deficiencies of existing programs and activities, together with recommendations for legislation". The Council's annual report indicates both improvement in some areas of environmental quality and regression in others.

Though this report can be printed, it is designed to be read as an online document on the Council's website. Online, the values on its charts will appear under the reader's cursor and the reader can access the many supplemental documents which are hyperlinked within it. "Quick Summary" boxes above most of the charts show the data trends for the past year and past decade.

In sending this report, the Council wishes, also, to acknowledge your efforts and leadership to address the State's serious climate challenge. The Council's annual report notes that greenhouse gas emissions from in-state sources, such as the electric power sector and the transportation sector, continue to be a significant concern.

It remains my personal privilege to serve the people of the State in this capacity and I look forward to any input or suggestions which you may have to inform the Council's work.

Respectfully submitted,

Keith Ainsworth, Esq.
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Summary

Generally, Connecticut's environment is better than it was ten years ago and significantly better than when the Council was created over 53 years ago. While the state's air and water quality have improved in the intervening 53 years, the warming of Connecticut's climate threatens to undermine the environmental progress of past decades. It is predicted that as the climate warms, severe weather events, such as drought conditions and extreme rainfall, might become more frequent. In 2024, drought conditions contributed to wildfires which adversely impacted Connecticut's air quality. More persistent impacts to air quality, specifically ground-level ozone, result when winds from the southwest and west transport ozone precursors from the large metropolitan areas into the state. Air emissions from mobile, industrial and commercial sources in Connecticut then enhance the production of ground-level ozone. Unless emissions in those states are reduced substantially, Connecticut residents are likely to continue to breathe unhealthy air.

Connecticut's changing climate is creating compatible loci for invasive species, like the Asian tiger mosquito, and impacting the distribution and abundance of native species, which can have negative economic, ecological, and public health impacts. This is already evident in the near collapse of Connecticut's lobster harvest. Animals, such as forest birds, turtles, and bats, and native plants will diminish as their habitat is impacted by development or transforms and becomes less habitable.

There is good news to report. The area of hypoxia in Long Island Sound during the summer months continues to decline due to several factors, such as the state's Nitrogen Control Program, improvements to wastewater treatment facilities, and better controls for stormwater runoff. Populations of eagles, osprey, and piping plover have generally increased over the last few decades due, in part, to successful reintroduction programs, and habitat protection measures. And while there has been a shift to more warm-adapted finfish species in Long Island Sound, overall finfish diversity in the Sound remains high.

Efforts made by the Governor and the General Assembly to address climate change are important and are supported by the Council. Nevertheless, greenhouse gas (GHG) emissions from in-state sources, such as the electric power sector and the transportation sector, continue to be a significant concern. Achieving the emission reduction goals set forth in several public acts will be difficult without drastic reductions in per capita greenhouse gas emissions. Programs and policies to promote renewable energy, such as solar, and electric-drive vehicles (EVs), have been successful and should be expanded. Additional efforts to reduce the amount of solid waste, and the consumption of energy through energy conservation and the more efficient use of energy, should be prioritized over developing new sources of electricity generation. Further, nature-based solutions, such as the preservation of open space land and farmland and forest management/urban forestry can help to combat climate change, reduce flood risk, improve water quality, enhance habitats, reduce urban heat, and improve the quality of life for Connecticut's residents.

A detailed list of recommendations with specific action items can be found on the Recommendations page.

Introduction – Understanding "Environmental Quality in Connecticut"

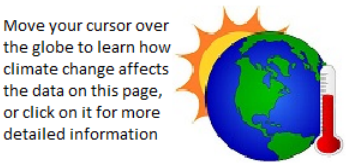
The Annual Report of the Council on Environmental Quality for 2024

published May x, 2025

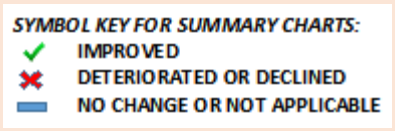
Welcome to *Environmental Quality in Connecticut*. As required by Connecticut General Statutes Section 22a-12(a), the council shall submit annually to the Governor an environmental quality report, which shall set forth: (1) the status of the major environmental categories including, but not limited to, the air, the water and the land environment; (2) current and foreseeable trends in the quality, management and utilization of the environment and the effects of such trends on the social, economic and health requirements of the state; (3) the adequacy of available natural resources for fulfilling human and economic requirements of the state in the light of projected population pressures; (4) a review of the programs and activities of the state and local governments and private organizations, with particular reference to their effect on the environment and on the conservation, development and utilization of natural resources, including, but not limited to, programs and measures of local governments implemented pursuant to subsection (d) of Section 22a-244b; (5) a program for remedying the deficiencies of existing programs and activities, together with recommendations for legislation; and (6) the progress towards achievement of the goals and objectives established in the state-wide environmental plan. This edition addresses the statutory requirements noted above and documents the condition of Connecticut's environment primarily during the 2024 calendar year.

This annual report is designed to be read online to allow use of the navigation buttons to move from section to section within it or to find the topics of interest in the Index. Online, the values on the charts will appear under the cursor.

Most of Connecticut's key environmental indicators are strongly affected by a changing climate. The symbol at right (example) identifies indicators that are so affected or those that affect the climate. For the online edition, running your cursor over the symbol will reveal a brief statement of the indicator's connection to climate that is also linked to more information. For the printed version, please refer to "Climate Notes" at the end of this annual report.



Summary Key for Indicators: Each page in the report has an environmental theme. Where an indicator shows change over time, there will usually be a summary key to allow for a quick evaluation of the status of that indicator. The top line is the indicator's status for the most recent year data is available; the second line shows that year's status compared to the ten-year trend; and the third line shows whether the indicator is on track to meet its goal, if applicable.



The asterisks in the body of the text refer to clarifying information found in the "Technical Note" section on most pages. The endnotes identify the primary source of the information.

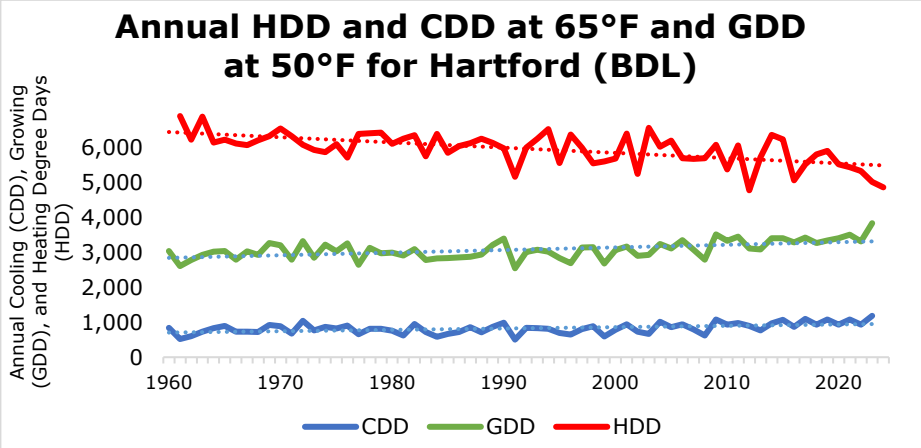
There may be updates to the 2024 annual report if data become available that were not available at publication. Sign up for e-alerts to receive a notice when updates are published. The Council welcomes your comments and questions.

The Climate Challenge*

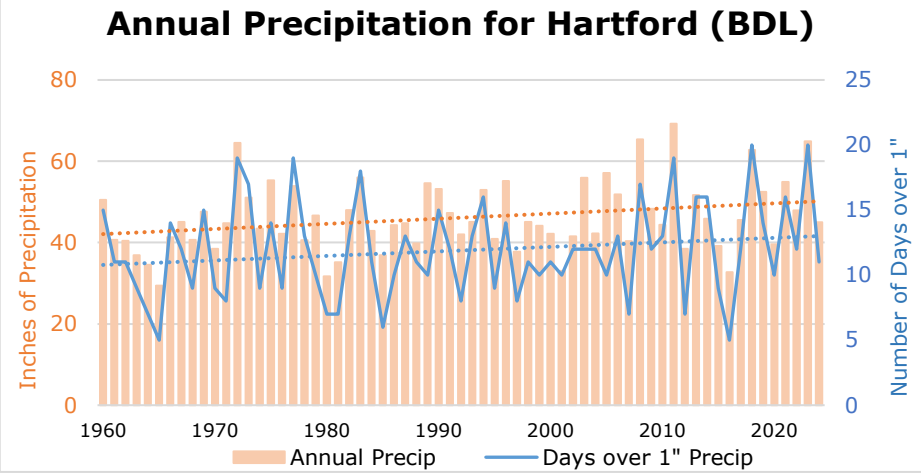
Nearly every environmental indicator in the 2024 annual report has a tie to the climate. The trend over more than sixty years suggests that Connecticut's climate is getting warmer, and precipitation is increasing.

The state's warming climate is evidenced by increasing annual average temperature, precipitation, annual cooling degree days (CDD) and growing degree days (GDD), and decreasing annual heating degree days (HDD).[1]

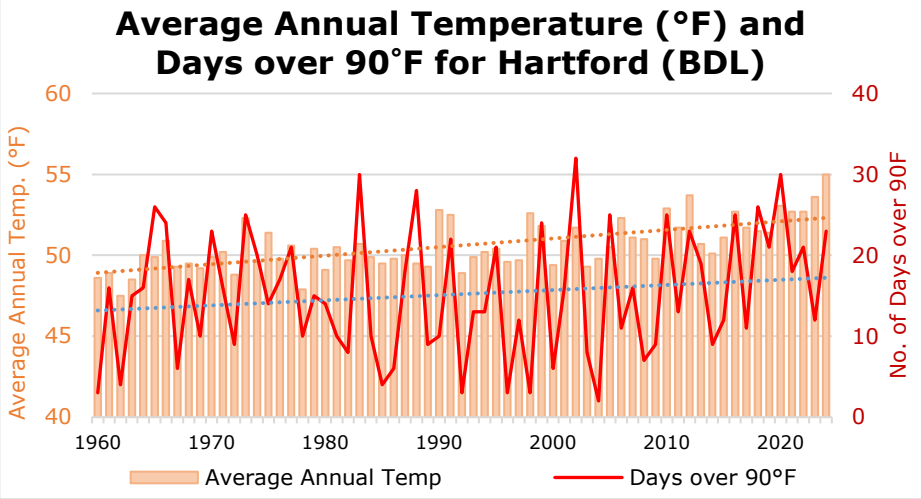
The trend for annual HDD is decreasing while the trends for annual CDD and GDD are increasing from 1961 to present. HDD for 2024 (4,852) was 19 percent less than the annual average since 1961, while CDD (1,183) and GDD (3,831) for 2024 were 44 and 25 percent greater, respectively, than the annual average since 1961.



Annual precipitation for 2024 (45") was 2.5 percent less than the annual average since 1960 (46.1"). The number of days in 2024 with rainfall greater than one inch (11) was 7.6 percent less than the annual average (11.9) since 1960. It is predicted that as the climate warms, severe weather events, such as drought conditions and extreme rainfall, might become more frequent.[2]



The annual average temperature for 2024 was 55 degrees Fahrenheit (°F)), which was above the average annual temperature of 50.5°F. The number of days with high temperatures greater than 90°F (23) was 51 percent greater than the average from 1960 to present (15.1).



Technical Note: *Weather data measured at Bradley International Airport (BDL).

Climate Changers

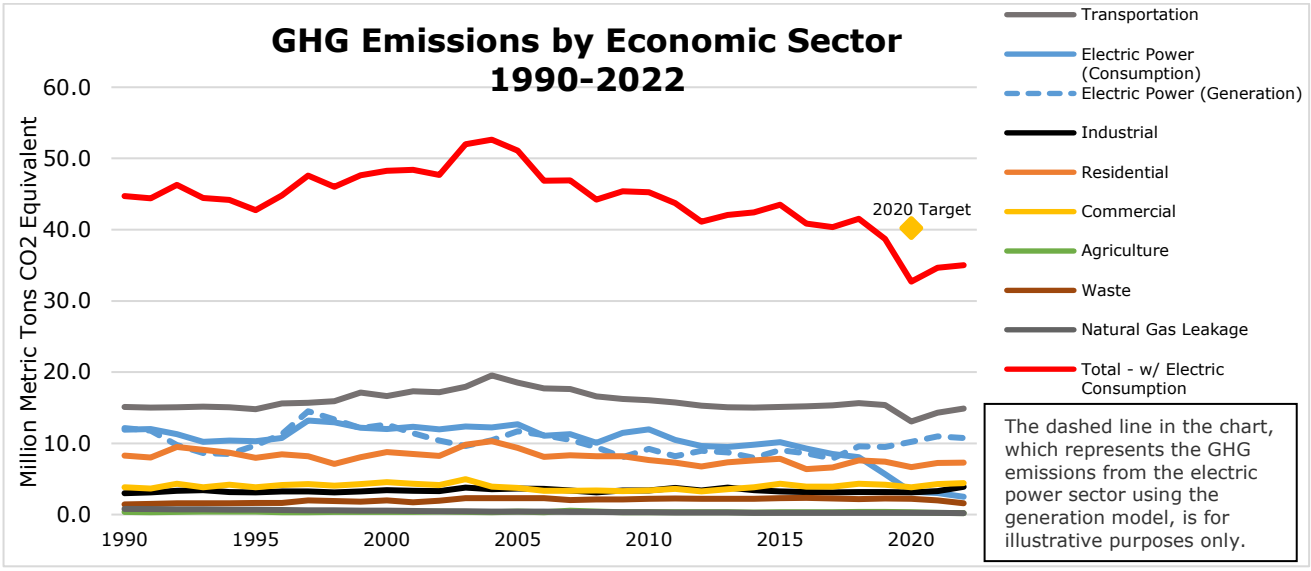
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✗ ON TRACK TO MEET GOAL

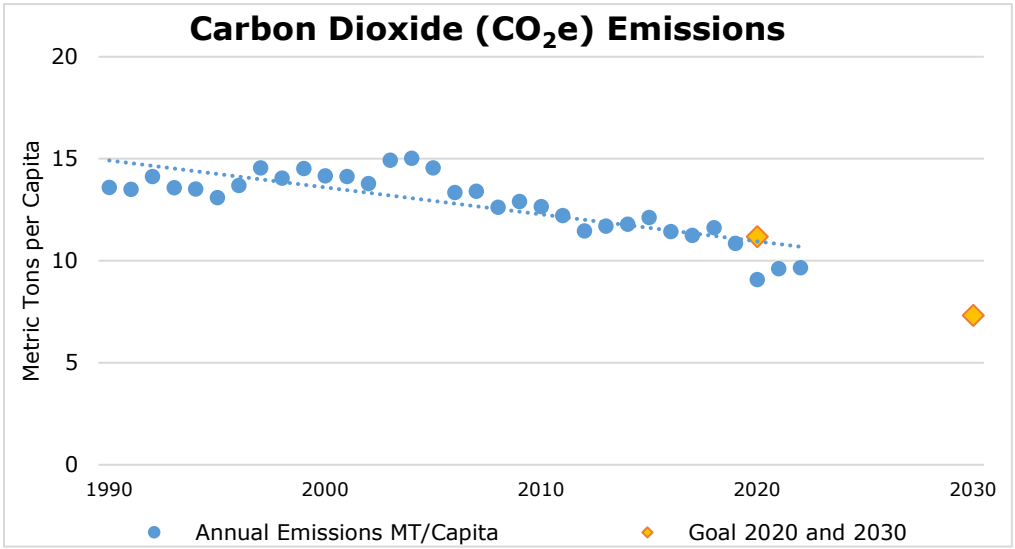
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Using the electric consumption model, it is estimated that total GHG emissions in 2022 (most recent data available) for all economic sectors increased by approximately seven percent from 2020 levels to 35 million metric tons of carbon dioxide equivalents ($MMTCO_2e$*). However this total was approximately 12 percent less than the previous ten-year average. The transportation sector is estimated to have accounted for the most GHG emissions in 2022 at approximately 43 percent, while the residential, commercial, and industrial sectors accounted for approximately 21 percent, 13 percent, and 11 percent, respectively. From 2020 to 2022, the largest increases in GHG emissions were seen in the industrial (24.6 percent), commercial (15 percent), and transportation (14 percent) sectors.

Using the electric generation model, it is estimated that total GHG emissions in 2022 (most recent data available) for all economic sectors increased by approximately nine percent from 2020 levels to 43.26 MMTCO2e. The transportation sector still accounted for the highest percentage of GHG emissions at 34 percent, but the percentage of emissions from the electric power sector ranked second at 25 percent.[3]

Per capita GHG emissions in 2022 (most recent data available) were estimated at 9.65 metric tons, using the electric consumption model. The goals on the chart have been adjusted to account for actual (2020) and projected (2030) population in Connecticut.



Goal: Prior to 2022, state law (Public Acts 08-98 and 18-82) set three goals for greenhouse gas emissions: reduce statewide emissions to 10 percent below 1990 levels by 2020, 45 percent below 2001 levels by 2030, and 80 percent below 2001 levels by 2050. Public Act 22-5 established a new goal for the state to reduce GHG emissions to a level of zero percent from electricity supplied to electric customers in the state by 2040.

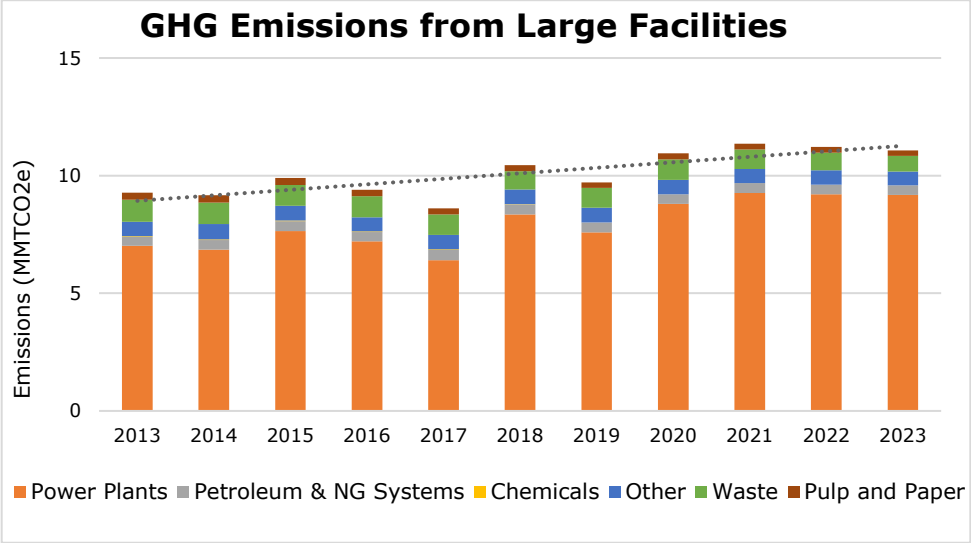
GHG Emissions from Large Facilities:

QUICK SUMMARY:

✓ COMPARED TO LAST REPORT

X COMPARED TO 10 YR. AVERAGE

— ON TRACK TO MEET GOAL



In general, facilities that directly emit 25,000 metric tons of carbon dioxide equivalent (CO_2e) or more per year are required to submit annual reports to EPA ("large facilities"). Facility-specific data from the EPA indicates that in 2023 (most recent data available), GHG emissions from 40 large reporting facilities in the state decreased by 1.4 percent from the previous year but was approximately 10.6 percent higher than the previous ten-year average. GHG emissions from 15 reporting facilities in the "power plant" sector decreased by approximately 0.3 percent from 2022 levels; however, emissions from these facilities were 17.2 percent higher than the previous ten-year average.[4]**

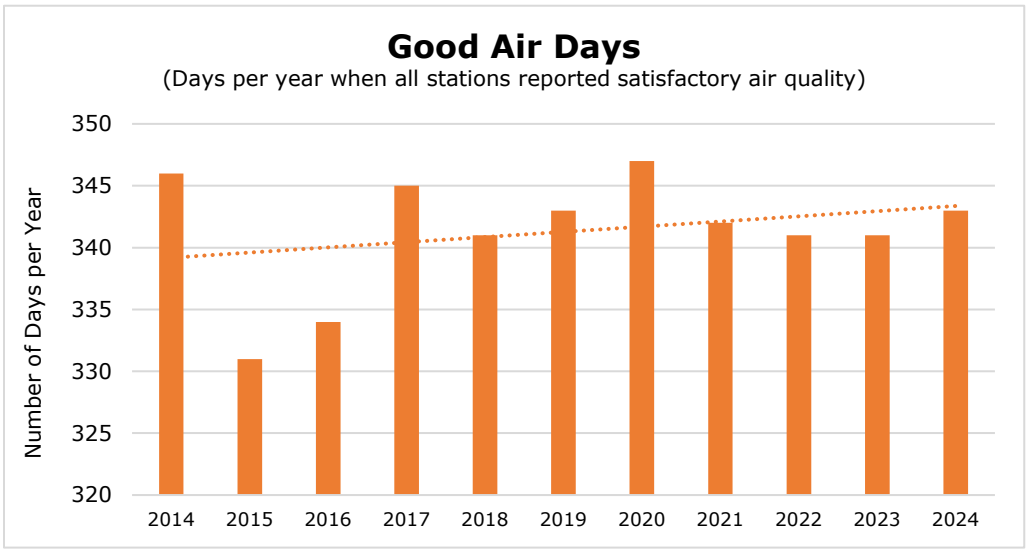
Technical Note: *Connecticut's GHG emissions are now calculated by the Department of Energy and Environmental Protection (DEEP) using the consumption of electricity, not the generation of electricity in the state. Emissions are reported in terms of carbon dioxide equivalents (CO2e, i.e., CO2 and other gases with equivalent climate warming impact. While carbon dioxide is the primary GHG, emissions of other GHGs are expressed on the basis of their potential to contribute to global warming, relative to carbon dioxide's potential. **The "power plant" sector made up approximately 83 percent of GHG emissions from large "reporting" facilities in Connecticut in 2023.

Air Days

QUICK SUMMARY:

- ✓ COMPARED TO LAST REPORT
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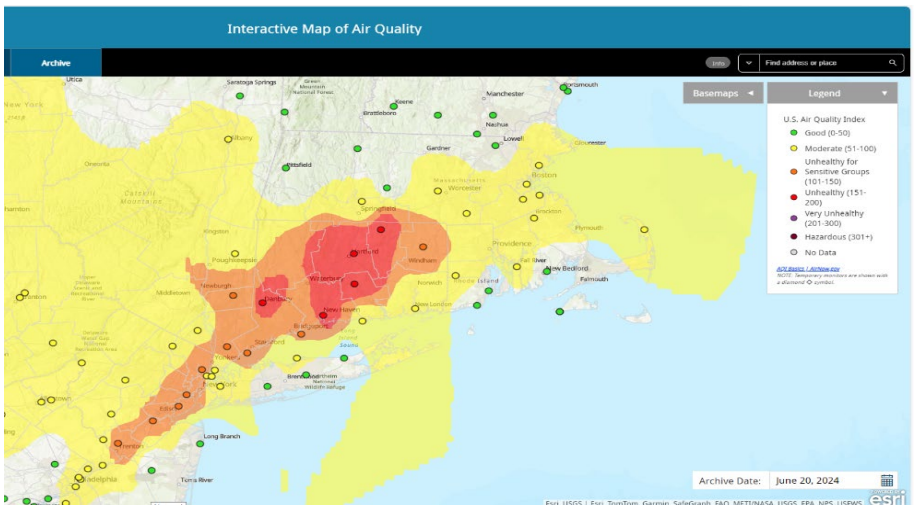


There were 343 "good air days" statewide in 2024, which was greater than the previous year and the previous 10-year average. A "good air day" is when every monitoring station in the state records "satisfactory air quality", which is defined here as air that meets the health-based National Ambient Air Quality Standard (NAAQS) for all of the following six pollutants: sulfur dioxide, carbon monoxide, particulate matter (PM2.5 and PM10), nitrogen dioxide, and ground-level ozone.

An Air Quality Index (AQI) above 100 is considered "unhealthy for sensitive groups", which includes people with heart or lung disease, older adults, and children. In 2024, there were 23 days when the AQI for ozone* exceeded 100.[5] When air quality is "unhealthy", some members of the general public may experience health effects and members of sensitive groups may experience more serious health effects.[6] Outdoor activities may be restricted or advised against for all populations.

The image (below) illustrates a bad-air day in 2024 for ozone that was more intense than average but followed the typical pattern of Connecticut having the worst ozone pollution in New England.[7] The yellow areas indicate moderate air quality that meets the standard for ground-level ozone*, while the orange and red areas did not. Some residents in the yellow areas, who are unusually sensitive to air pollution, might have also been adversely affected.

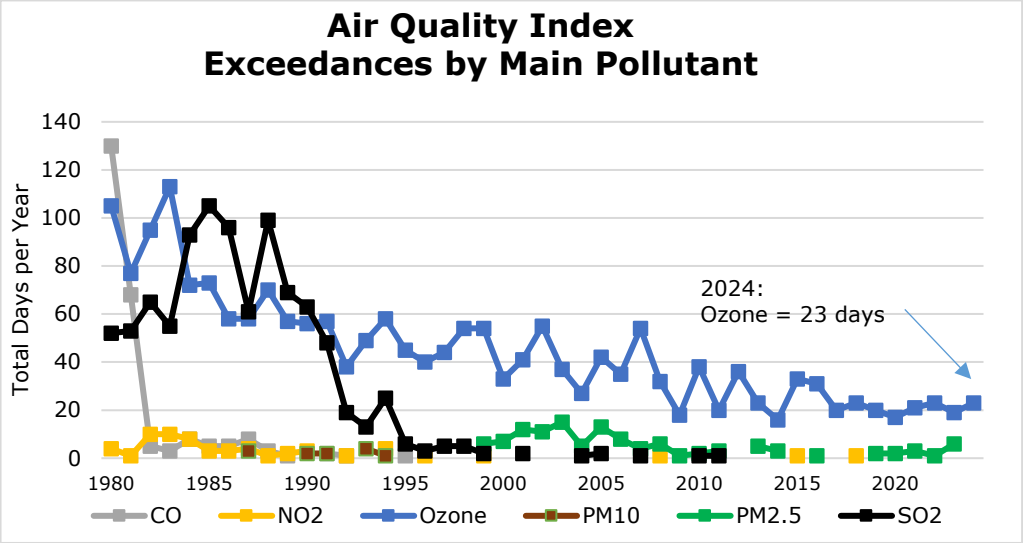
High ozone concentrations typically occur on hot summer days when winds from the southwest and west transport ozone precursors from the large metropolitan areas of the Mid-Atlantic, especially from the New York City area. Air emissions from mobile, industrial and commercial sources in Connecticut then enhance the production of ground-level ozone.[8] Past ozone



control strategies for nitrogen oxides (NOx) have centered around point source electrical generating units, which have been effective in reducing long-range air pollutant transport into Connecticut. Increasingly, area sources and on-road / non-road mobile sources have become the dominant source of nitrogen oxides (NOx) production.[9]

On July 25, 2024, the Environmental Protection Agency (EPA) published a final rule, granting a request from the States of New York, New Jersey, and Connecticut to reclassify the New York-Northern New Jersey-Long Island, (NY-NJ-CT) ozone nonattainment area from "Moderate" to "Serious" for the 2015 8-hour ozone NAAQS. On July 29, 2024, EPA published a final rule reclassifying Greater Connecticut from "Moderate" to "Serious" nonattainment for the 2015 ozone NAAQS. The result of these changes means the attainment dates move to August 2027, based on certified 2024-26 monitoring data; however, reclassification does not change the submission requirement or implementation deadlines for elements of the State Implementation Plan (SIP) that were due for the Moderate classification for Southwest Connecticut and Greater Connecticut areas.[10]

Air Pollutants:



There has been a long-term trend of improved air quality, in part, due to the air pollution controls that were put in place after the enactment of the 1971 Clean Air Act. The Clean Air Act Amendments of 1990 are achieving large health benefits that will grow further over time as programs take full effect. The chart above, "Air Pollutants", depicts that in the 1980's, exceedances for sulfur dioxide (SO2) and nitrogen dioxide (NO2) were more common, but not so recently. Statewide exceedances of pollutants, except for ozone, are rarely seen, due to federal restrictions on emitters, mostly to Connecticut's west and southwest.**

Goal: While not formally stated, the goal is for Connecticut residents to have a "good air day", every day.

Technical Note: *The federal air quality standard for ozone was revised prior to the 2016 ozone season. The new standard (0.070 PPM over eight hours) is slightly more protective of human health than the older standard (0.075 ppm). **Lead (Pb) is not shown. Connecticut's lead levels have been below the national standard (NAAQS) since 1994.

Preserved Land

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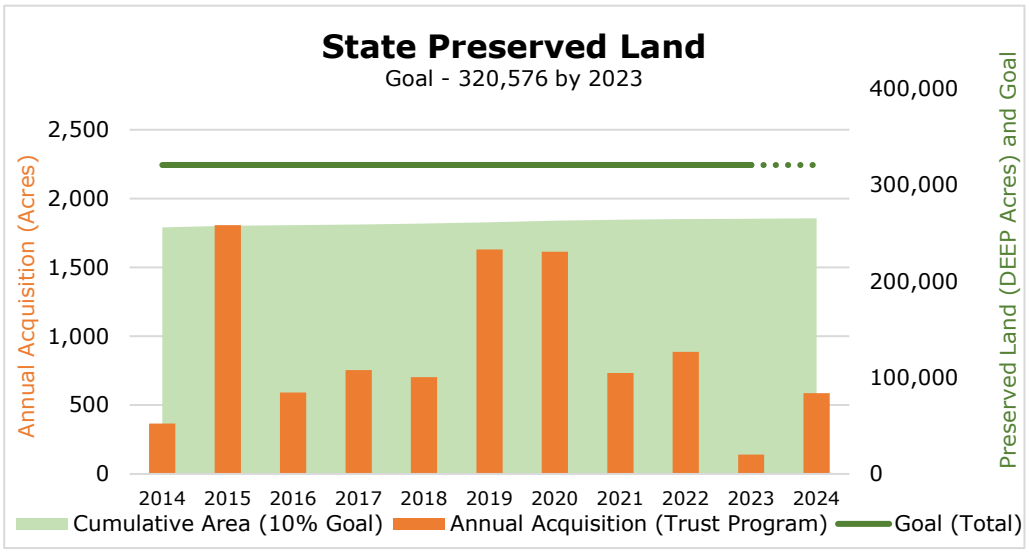
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Goal #1: State Owned Land – ten percent



In 2024, the Department of Energy and Environmental Protection (DEEP) acquired 586 acres of land* and secured a conservation easement on approximately 1,322 acres under the Recreation and Natural Heritage Trust Program (Trust Program), the primary vehicle for adding land to the state's system of parks, forests, wildlife areas, water access areas, and other open spaces. The state invested more than $1.127 million and leveraged more than $1.447 million to acquire the 586 acres of land and the conservation easement.[11] Over the previous ten years, the state preserved an annual average of 923 acres. The reduction in the acreage of state land acquired in 2024 is due, in part, to limited staffing at DEEP and the amount of funds available to procure land.

The total area of land preserved by DEEP as open space, held in fee, is estimated to be approximately 265,258 acres. While DEEP has made progress to increase the amount of land preserved, DEEP's preservation efforts were 55,318 acres short of reaching the preservation goal of 320,576 acres by 2023. At the average acquisition rate of 923 acres per year (based on the previous ten years), it would take DEEP approximately 60 years to achieve the ten percent goal. In addition to the Trust Program, DEEP can issue a draft recommendation to the Secretary of the Office of Policy and Management (OPM) as to whether all or a portion of land or land interest, identified for transfer or sale by another state agency, should be preserved by transferring the land or land interest or granting a conservation easement to DEEP.

Open space provides Connecticut's residents with economic, recreational, and environmental benefits including, but not limited to: options for outdoor activities, preservation of scenic beauty, habitat protection, increased biodiversity, protection of unique bedrock and surficial geologic features, water protection and flood control. In addition, forests, farmland and other natural habitats absorb more greenhouse gas (GHG) emissions than they emit.**

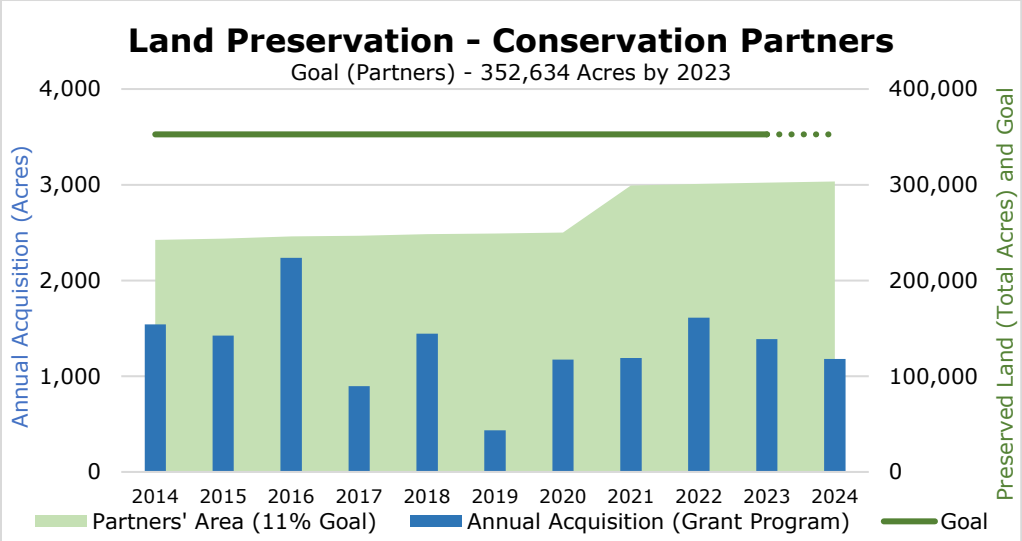
Goal #1: The State shall acquire ten percent of Connecticut's land for preserved open space. This goal was set in statute in 1997 (Connecticut General Statutes, (CGS) Section 23-8(b)).

Technical Note: *The annual and total acreage identified in the chart is primarily owned in fee by the State. A notable exception is a 111-acre easement acquired in 2020, which is included in the State acquisition total. State "preserved land" does not mean land that is not managed or harvested. The land acquired by the state as open space might not be restricted from logging or other types of management or from recreational activities. **Nationally, in 2022, the Land Use, Land-Use Change, and Forestry (LULUCF) sector resulted in a net increase in carbon stocks (i.e., net CO2 removals) that represents an offset of approximately 14.5 percent of total (i.e., gross) greenhouse gas emissions in 2022.[12]

QUICK SUMMARY:

X COMPARED TO LAST REPORT
X COMPARED TO 10 YR. AVERAGE
X ON TRACK TO MEET GOAL

Goal #2: Other Conservation Lands – eleven percent



In 2024, state grants helped municipalities and land trusts acquire or protect 1,181 acres through the Open Space and Watershed Land Acquisition Grant Program (Grant Program), whereby DEEP provides financial assistance to municipalities and nonprofit land conservation organizations (conservation partners) to acquire land for open space.[13] The amount of land preserved as the result of grants from the Grant Program in 2024 was less than the previous year and less than the ten-year average of 1,334 acres.

Unfortunately, the exact amount of land held by DEEP's conservation partners is very difficult, if not impossible, to determine because land trusts are continuously acquiring properties for conservation and outdoor recreation, the inventory of municipal land is incomplete, it is very difficult to track easements, and there is no centralized accounting of privately preserved lands. For 2024, the Council estimated that more than 303,422 acres were held in fee as open space land by DEEP's conservation partners. This would be approximately 86 percent of the goal of 352,634 acres. The spike in 2021, depicted in the chart above as "Partner's Area", is due to the Council's assessment of land trust land and water company land.

As noted above, it is estimated that DEEP has preserved approximately 265,258 acres (Goal 1) and its conservation partners "hold" at least 303,422 acres (Goal 2) as open space for a total of approximately 568,680 acres or approximately 84.5 percent of the total statewide goal of 673,210 acres.

Public Act 24-69 made changes related to the Grant Program, including changing the circumstances under which grant funds can be used to restore or protect open space an applicant already owns. Public Act 24-10 authorizes DEEP to utilize funds available for stormwater infrastructure for the purpose of acquiring conservation easements located along streams and rivers in the state.

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Goal #2: Pursuant to CGS Section 23-8(b), "not less than eleven percent of the state's land area is held by municipalities, water companies or nonprofit land conservation organizations as open space". The goals identified above are believed to have been established by Governor John Rowland in 1998.[14]

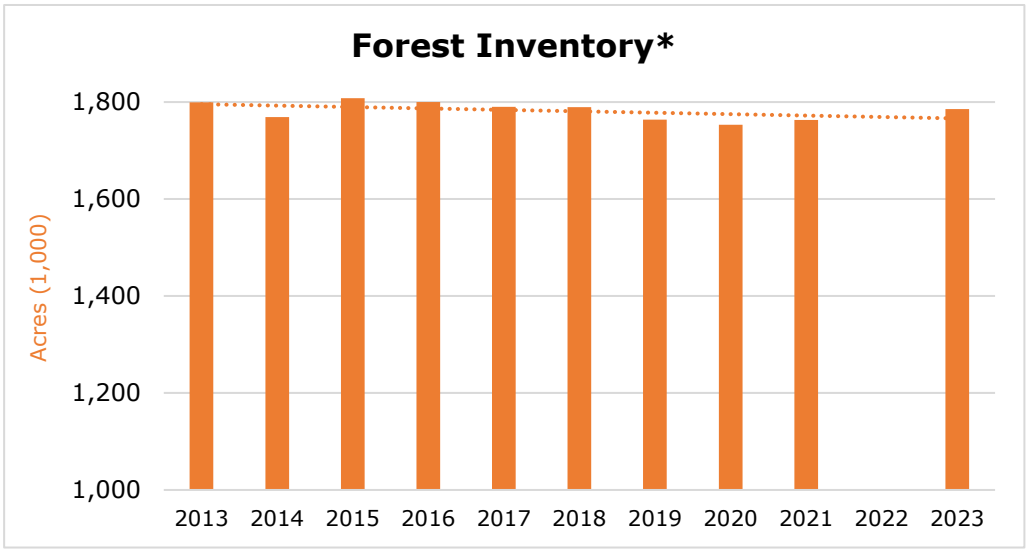
Forests

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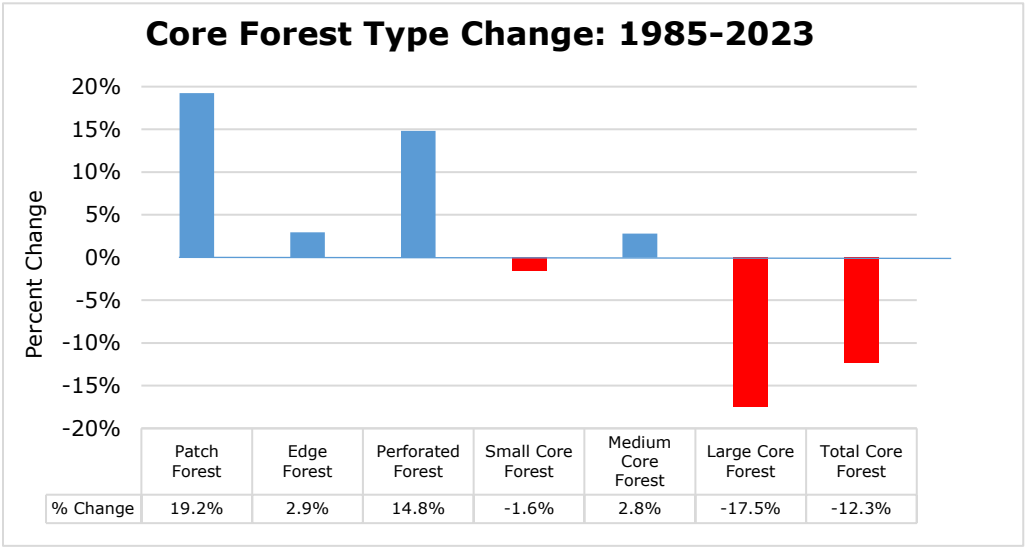
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Forest Inventory: It is estimated that forests cover between 57 – 60 percent of the land area in the state. The amount of forest land in Connecticut in 2023 (most recent data available) is estimated to have increased by 1.3 percent since the 2021 inventory and was 0.3 percent greater than the previous ten-year average.[15] Approximately 71 percent of forest land in Connecticut is privately owned. In 1972, the first full year of the Council's existence, the amount of forest land in Connecticut was estimated to be 1,860,800 acres or roughly 59 percent of the area of the state.[16]



Forests and other natural habitats reduce adverse water quality impacts associated with development, impervious surfaces, and certain agricultural practices; sequester and store carbon; and provide valuable habitat. Research is showing that visiting a forest has real, quantifiable health benefits, both mental and physical.[17]



	Patch Forest	Edge Forest	Perforated Forest	Small Core Forest	Medium Core Forest	Large Core Forest	Total Core Forest
% Change	19.2%	2.9%	14.8%	-1.6%	2.8%	-17.5%	-12.3%

Core Forest Acres**: Core forests are defined as unfragmented forest land that is 300 feet or greater from the boundary between forest land and nonforest land. Core forests provide habitat for many species of wildlife (edge-intolerant species), provide connectivity and corridors for species migration, and increased opportunity to maintain overall biodiversity. The loss of core forests diminishes the remaining forests' water purification and habitat values, and could result in heavier runoff, which might lead to poorer water quality and increased flooding.[18] Forests that are fragmented, or divided by roads and development, provide some forest functions but do not contribute the full range of

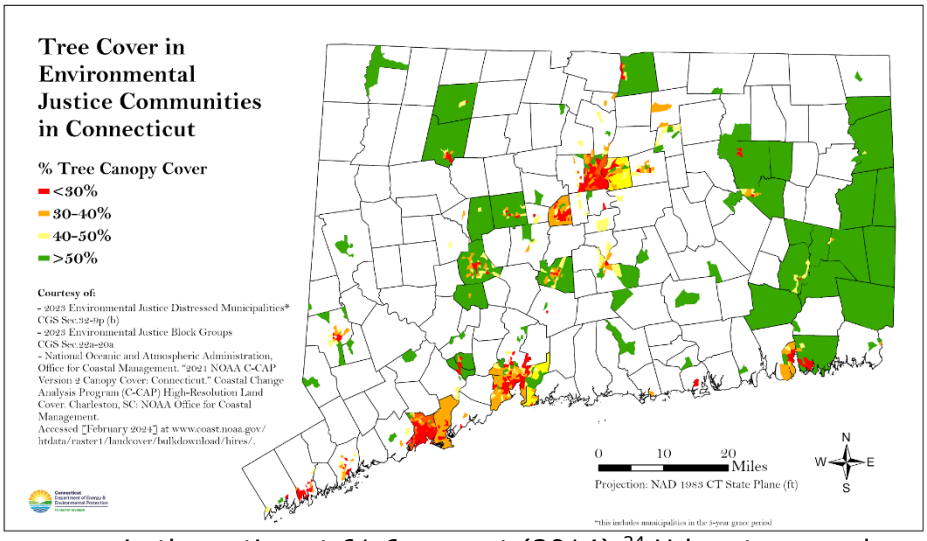
ecosystem services that larger core forest blocks do. Fragmented forests[19] might not be able to provide the habitat needed for some species of wildlife, and, in many cases, less opportunity for a variety of recreational activities. Invasive species of plants and animals often colonize areas in the wake of activities that result in fragmented forests, thereby diminishing further the value of such forests.

As depicted in the chart above, large (>500 acres) core forests, which make up approximately 35 percent of the total core forest area in Connecticut, have seen the greatest percentage decline since 1985 (-17.5 percent). Patch forests (19.2 percent)and perforated forests (14.8 percent) have seen the greatest percentage increase over that same time period; however, patch forest and perforated forests only make up 3.8 percent and 10.7 percent of forest type in Connecticut, respectively. Overall, total core forest area has declined by more than 12 percent over the last 38 years.[20]

Connecticut's forests sequester and store carbon above and below ground in their roots, trunks and branches and as long-lived wood products (e.g., carbon stored in lumber and furniture). Carbon sequestration rates and storage vary by stand age, tree species, growing conditions (including soil type, regional climate, topography), and disturbance regimes (natural or silvicultural).[21] Carbon sequestration is also impacted by the type of trees that comprise the forest. In the northeastern United States, carbon sequestration rates typically peak when forests are around 30–70 years old, but trees continue to sequester carbon through their entire life span.

Public Act 24-151, Section 63 requires the Connecticut Department of Transportation (DOT) to provide a grant from available resources to the Department of Natural Resources and the Environment at The University of Connecticut (UConn) for the purpose of studying carbon sequestration by trees and other vegetation along highways and other areas in the state.

Urban Forests:[22]



Urban forests are composed of all trees within urban areas. Urban forests differ from rural forests in that urban forests typically have a lower density and percentage of tree cover, and the trees are often associated with human activity and built structures. In 2020, (most recent data available) approximately 35 percent of Connecticut's land area was designated as "urban".[23] Connecticut also had one of the highest urban tree cover in the nation at 61.6 percent (2014).[24] Urban trees and forests help keep cities cooler and absorb stormwater, help filter the air and water, maintain biodiversity, and increase resilience to climate change impacts.[25]

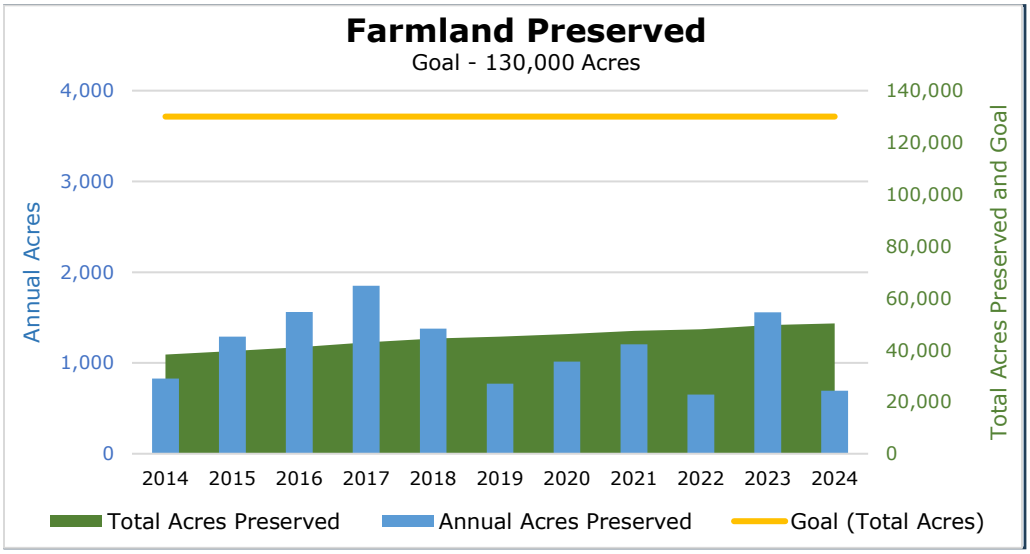
Goal: "Keeping forest as forest" is the overarching goal of Connecticut's 2020 Forest Action Plan. Public Act 23-206, Section 2 established a goal for environmental justice communities with current tree canopy cover less than 40 percent to increase the tree canopy area by five percent by 2040.

Technical Note: *The vertical axis in the "Forest Inventory" chart above has been shortened, beginning at 1,000 (1,000 acres) or one million acres rather than the customary zero. There is no data for estimated forest acres for 2022.
**Estimates of core forest acres were derived from data of the University of Connecticut's (UConn) Center for Land Use Education and Research (CLEAR), which uses imagery and data derived from the National Land Cover Database (NLCD)- 30-meter resolution, to identify forests that are at least 300 feet from non-forest development, such as roads, buildings and farms.

Farmland

QUICK SUMMARY:
X COMPARED TO LAST REPORT
X COMPARED TO 10 YR. AVERAGE
X ON TRACK TO MEET GOAL

Move your cursor over the globe to learn how climate change affects the data on this page, or click on it for more detailed information



In 2024, Connecticut preserved 693 acres of agricultural land, which was approximately 43 percent less than the previous ten-year average of 1,211 acres. The number of farmland properties preserved in 2024 was 11, the average acreage per farmland property was 63, and the average cost per acre was $5,514, which was 7.5 percent less than the average cost per acre for the previous three-year period (2021-2023).[26]

The cumulative acreage preserved by the Connecticut Department of Agriculture (DoA), which began preserving agricultural land by purchasing development rights in 1978, has increased slowly and now totals approximately 50,250 acres.

Council projections prepared in 2024 indicate that it would take approximately 66 years to achieve the state's farmland preservation goal of 130,000 acres, based on the average annual acquisition rate for the last ten years (1,197), including acreage for 2024. During that time, additional farmland can be expected to be lost to development. The total land area in farms in Connecticut for 2024 (most recent data available) was estimated at 370,000 acres, which was a decline of approximately 2,000 acres from 2022 data.[27] In 1982, the total land area in farms in Connecticut was reported to be approximately 444,200 acres, a loss of approximately 74,000 acres or 17 percent since 1982.[28] The rate of farmland loss may change as demand for locally produced food and agricultural products increases or as development pressure increases, such as for electricity generation.

In addition to the production of food and agricultural products, Connecticut's farms have a role in mitigation of, adaptation to, and resiliency from the negative impacts of climate change. Well managed farms store carbon from the atmosphere in soils and plants, capture and store water from extreme precipitation events, and provide for biomass derived renewable energy. Soil is one of the sinks for atmospheric carbon, and one that can be managed to mitigate the effects of climate change.[29]

Public Act 24-100 Sections 1 and 2 eliminated a requirement that the Commissioner of DoA consult with the DEEP Commissioner before approving a request to remove a development rights restriction from agricultural land.

Goal: The Connecticut Farmland Preservation Program aims to protect 130,000 acres of Connecticut's most productive farmland.

Inland Wetlands

In Connecticut, inland wetlands are defined as land, including submerged land (not including tidal wetlands) "which consists of any of the soil types designated as poorly drained, very poorly drained, alluvial, and floodplain by the National Cooperative Soil Survey, as may be amended from time to time, of the Natural Resources Conservation Service (NRCS) of the United States Department of Agriculture (USDA)".[30] According to data from the USDA's NRCS, there are or were approximately 95,000 acres underlain by alluvial and floodplain soils and 366,000 acres underlain by poorly drained and very poorly drained soils in Connecticut. Collectively, the area underlain by these soils is estimated to account for approximately 14 percent of the total area in Connecticut.

Implementation of the inland wetlands law has been problematic.
In 1972, the state legislature enacted the Inland Wetlands and Watercourses Act (IWWA), which provides a regulatory process to protect wetlands. Activities that are likely to affect inland wetlands and watercourses are regulated by each town's municipal inland wetlands agency; however, there is no standard requirement for regulation of the upland area adjacent to identified wetlands.

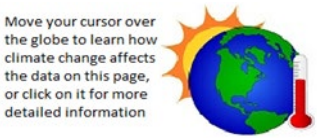
Regulated activities for wetlands include, but are not limited to, filling, dredging, clearing, grubbing, grading, piping, culverting, channelizing, diverting, damming, dewatering or otherwise temporarily or permanently altering inland wetlands and watercourses. A report by the Council in 2008, *Swamped*, identified a number of problems with how the law was being implemented. Though some improvements have been made, such as the provision of online training* and the availability of an electronic complaint reporting form to file a coastal or inland water resource complaint, there remain issues related to efficient implementation:

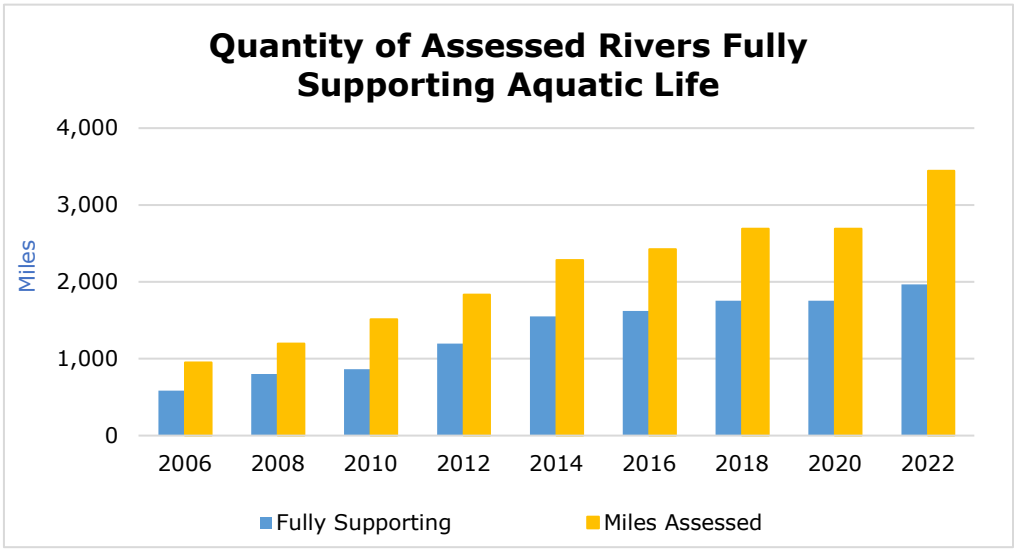
- The requirement that at least one member of a municipal inland wetlands agency be trained is not tracked or enforced. This is due, in part, to the limited staff resources at the Department of Energy and Environmental Protection (DEEP) assigned to assist municipal wetland agency officials, and the registration for the online training does not require information, such as municipality, role, or affiliation.
- Establishing long-term agreements and funding for the online training program for municipal inland wetland officials. In 2024, there were 290 total registrants for the online training and 143 participants completed the course and earned certificates.[31]
- Data that are required to be submitted by municipalities on the actions of their inland wetlands agencies are still not automatically entered into a database. This requires the limited staff resources at DEEP to transfer the data that DEEP receives on written or emailed forms into a database manually.

Wetlands serve many functions; one of them being their unique ability to store and sequester carbon. Forested wetlands, which comprise most of the inland wetlands in the state, serve as important carbon sinks and continue to sequester carbon as organic matter within the forested system (both above and below ground). The substantial extent of forested wetlands across the state should be recognized as important to greenhouse gas (GHG) mitigation strategies and incorporated into inland wetland protection efforts in Connecticut. [32]

Technical Note: *Connecticut General Statutes (CGS) Section 22a-42(d) requires that at least one member of the inland wetlands agency or staff of the agency be a person who has completed the comprehensive training program. Connecticut General Statutes (CGS) Section 22a-42(d) requires that at least one member of the inland wetlands agency or staff of the agency be a person who has completed the comprehensive training program. The online training program fulfills the requirement pursuant to Connecticut General Statutes (CGS) Section 22a-42(d) that at least one member of the inland wetlands agency or staff of the agency be a person who has completed the comprehensive training program.

Rivers, Lakes, and Estuaries

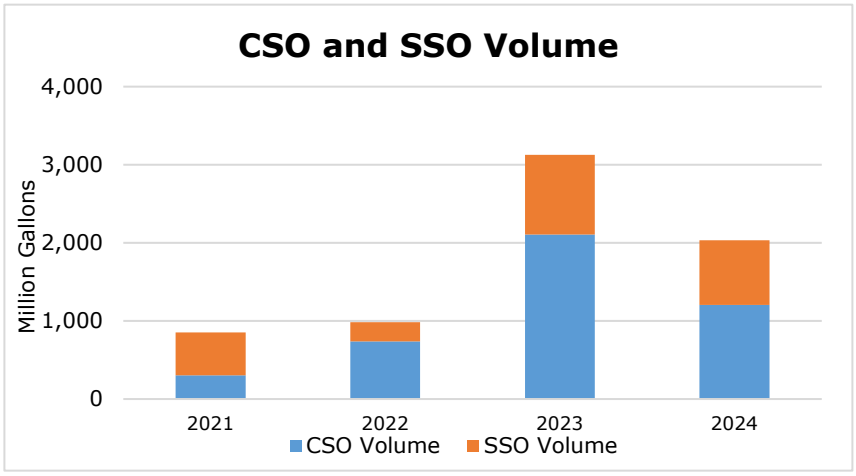




The Department of Energy and Environmental Protection (DEEP) assesses water quality for each designated use (aquatic life, recreation, and fish consumption) for some waterbodies in the state, which characterizes whether the water is suitable for that designated use. While there has been an increase in the number of river miles assessed, there has been a slight decrease in the percentage of assessed river miles that fully support aquatic life. In addition, there has been little change in percentage of assessed lakes and estuaries that "fully support" aquatic life in recent years.[33]

Goal: Section 101(a)(2) of the CWA (1972) established a national goal for "water quality which provides for the protection and propagation of fish, shellfish, and wildlife, and recreation in and on the water, wherever attainable".

Combined sewer overflows: (CSOs) are discharges of untreated sewage and sanitary sewer overflows (SSOs) are also discharges of untreated sewage and are sometimes referred to as spills or bypasses. The occurrence of CSOs and SSOs increases when significant rainfall occurs, particularly from extreme weather events. During heavy rains, untreated stormwater and wastewater, which can contain pathogens, excess nutrients, and chemicals, may be discharged at CSO locations. The discharge of untreated or partially treated sewage can adversely impact water quality, which effects recreational and economic opportunities, such as swimming and shellfishing. As depicted in the chart, more than 1.2 billion gallons of CSO volume and over 800 million gallons of SSO volume were released to waterbodies in Connecticut in 2024.* Almost 82 percent of the total CCO volume released in 2024 was attributed to the Bridgeport West and Metropolitan District Commission (MDC) treatment facilities, while almost 80 percent of the total SSO volume released in 2024 was attributed to facilities in New Haven, Bridgeport, and West Hartford.[34]

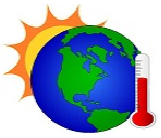


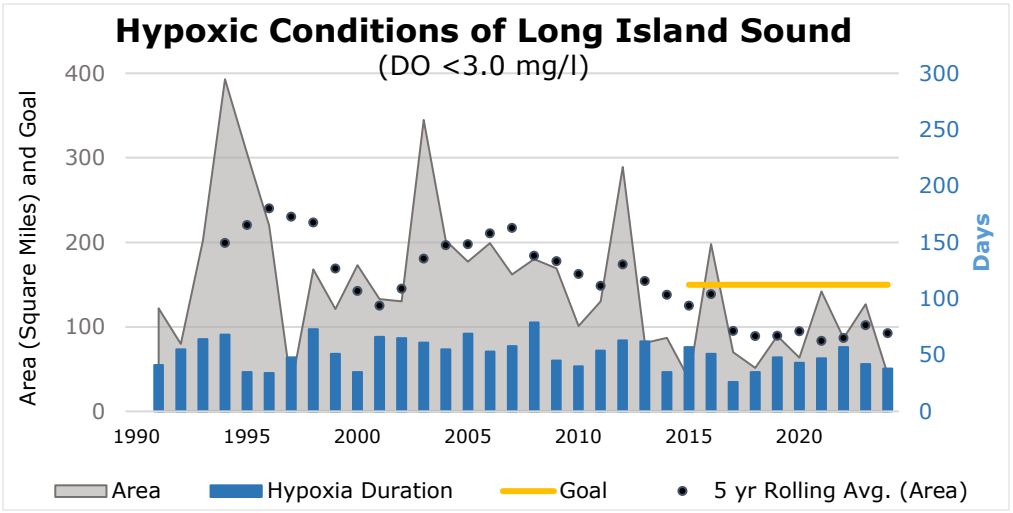
The Water of Long Island Sound

QUICK SUMMARY:

- ✓ COMPARED TO LAST REPORT
- ✓ COMPARED TO 10 YR. AVERAGE
- ✓ ON TRACK TO MEET GOAL

Move your cursor over the globe to learn how climate change affects the data on this page, or click on it for more detailed information

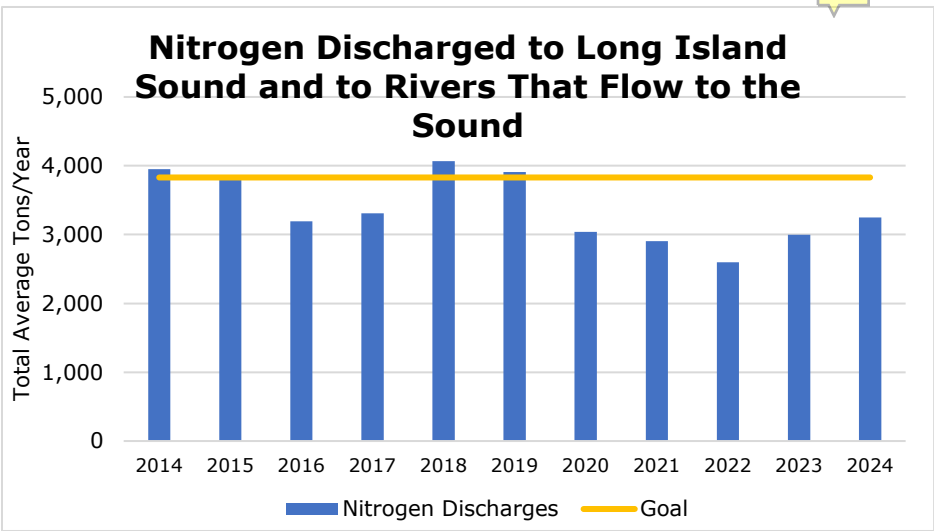




The maximum area of Long Island Sound with hypoxia, which is water with a dissolved oxygen (DO) concentration less than 3.0 milligrams per liter (mg/l), decreased from 127 square miles in 2023 to approximately 43.4 square miles in 2024. The duration of the hypoxic conditions also decreased from 42 days in 2023 to 38 days in 2024.[35] Most, if not all, of the hypoxic conditions are found in the western basin of the Sound, which is also affected by contributions from New York State. Several factors, such as the state's Nitrogen Control Program, improvements to wastewater treatment facilities, and better controls for stormwater runoff have reduced the area of hypoxic conditions in the Sound since pre-2000 levels.

Goal: The goal line on the top chart approximates the maximum area (~150 miles^2) of the hypoxia target to "measurably reduce the area of hypoxia in Long Island Sound … by 2035".[36]

Nitrogen Discharges:

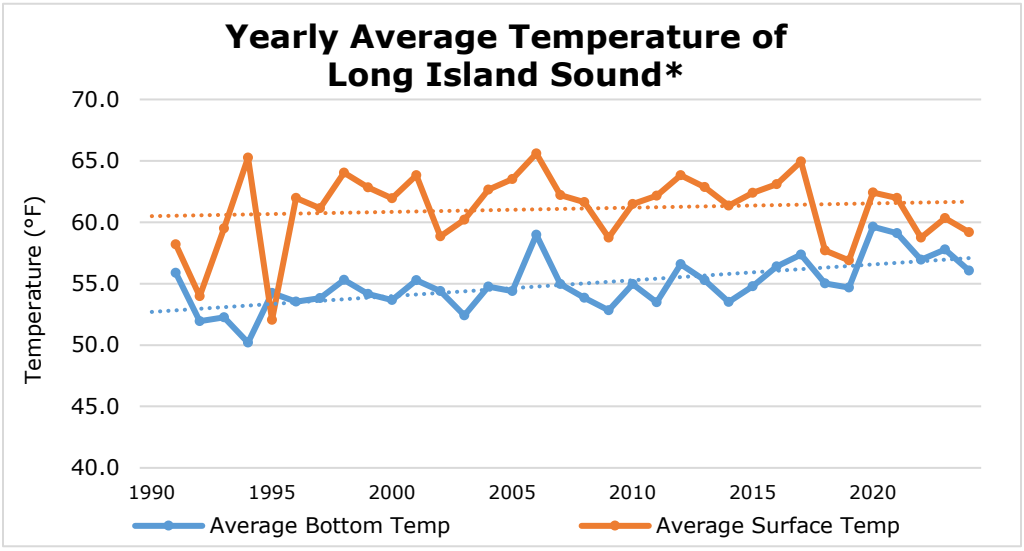


In 2024, the total average for nitrogen discharges (tons per year) for the 77 water pollution control facilities in the state increased by 8.4 percent from the previous year, but was five percent less than the previous ten-year average.[37] The increase in 2024 compared to the previous year was likely due to the effect of cold heavy rain events which started in December of 2023 and continued through about May of 2024. Connecticut has reduced nitrogen discharges over the last decade by investing in nitrogen-removal technology at sewage treatment plants and implementing a Nitrogen Control Program; however, reducing nitrogen discharges from non-point sources remains a challenge.

Goal: Substantial reduction of nitrogen discharges is a goal that is shared by Connecticut and New York (2001). Connecticut established a goal of a maximum of 3,830 tons per year of nitrogen by 2014.[38] Nitrogen discharges "upstream" of Connecticut also contribute to the nitrogen loading.

The Warming and Rising Waters of Long Island Sound

Move your cursor over the globe to learn how climate change affects the data on this page, or click on it for more detailed information

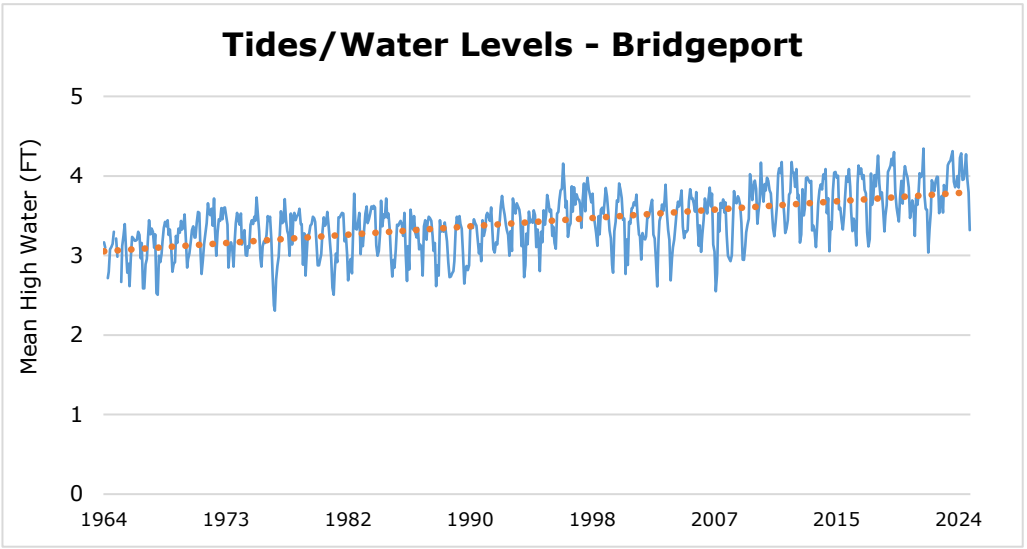


In 2024, the annual average surface water temperature for Long Island Sound was 59.2 degrees Fahrenheit (°F) and the annual average bottom water temperature for the Sound was 56.1°F [39]

Annual variations in water temperature and water levels in the Sound are less important than longer term trends. The trends for average annual bottom and surface temperature of the Sound have been rising, with the average bottom temperature rising at a faster rate than the surface water. While the long-term impact of warmer water in the Sound is unknown, species diversity and biomass remain high, and there has been a shift to more warm water tolerant species.

Water Levels**

The average monthly value for mean high water (MHW) for 2024 at Bridgeport was 3.96 feet.[40] The trend for water levels at Bridgeport over the last 60 years is increasing. The natural "migration" of wetlands landward in response to sea level rise is prevented in many places by fill and development.



Goal: While there is no established goal for water temperature or sea level rise in Long Island Sound, it is assumed that a significant increase in temperature and water level is not a desired outcome.

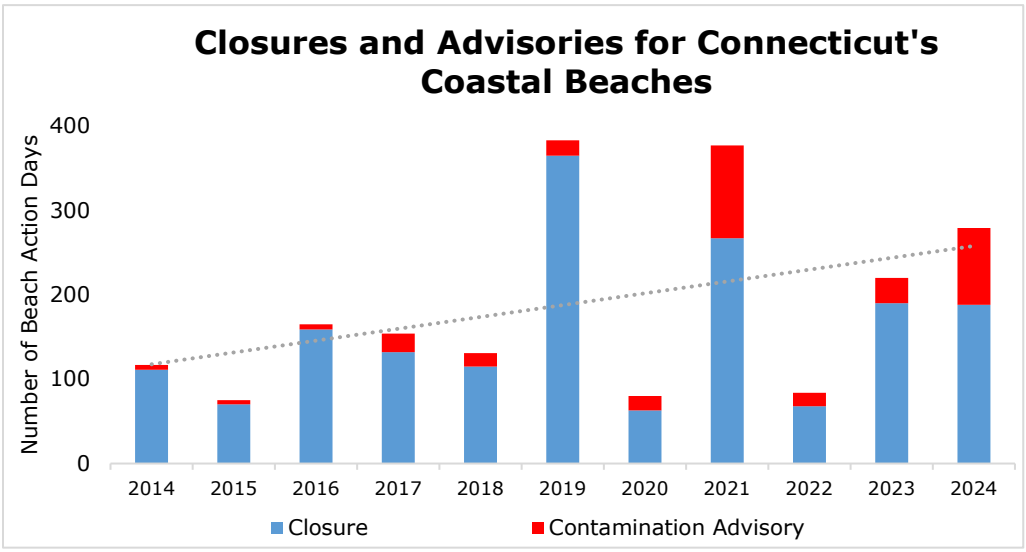
Technical Note: *The vertical axis in the average temperature of Long Island Sound chart above has been shortened, beginning at 40.0°F rather than the customary zero. **The relative sea level trend is 3.44 millimeters/year (mm/yr) with a 95 percent confidence interval of +/- 0.38 mm/yr based on monthly mean sea level data from 1964 to 2024 which is equivalent to a change of 1.13 feet in 100 years, which is an increase from last year's estimate that was 1.09 feet in 100 years.[41]

Swimming

QUICK SUMMARY:

X COMPARED TO LAST REPORT
X COMPARED TO 10 YR. AVERAGE
— ON TRACK TO MEET GOAL

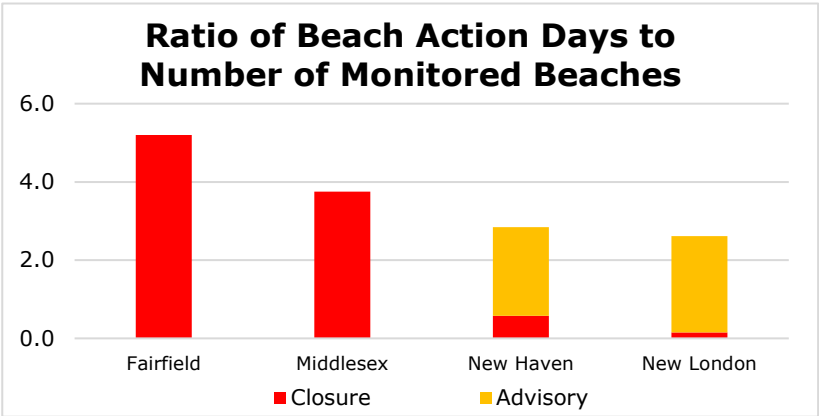
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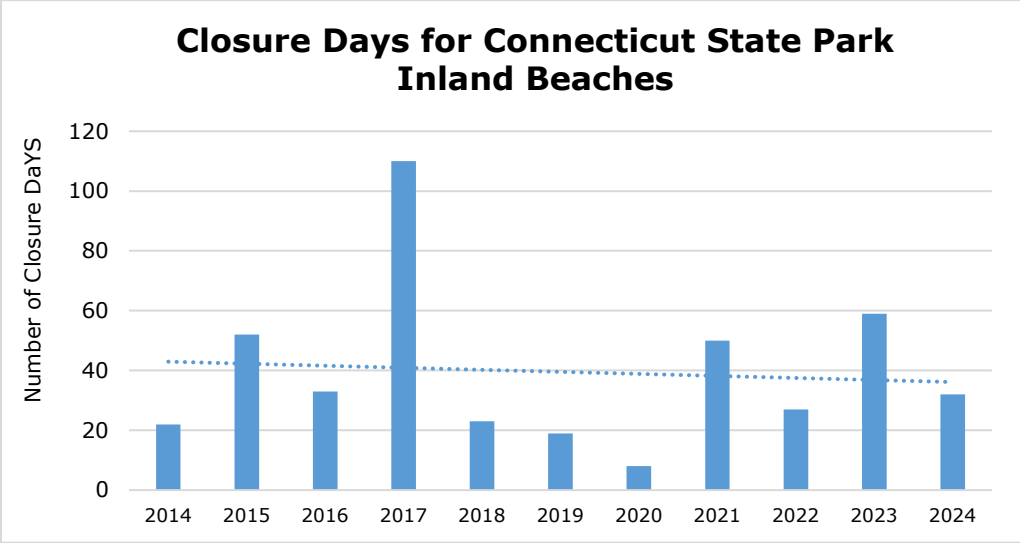


There were 279 beach action* days for all 73 reporting coastal beaches in Connecticut in 2024. Of the 279 beach action days, which was approximately 56 percent greater than the previous ten-year average (179), 188 (67 percent) were closures and 91 (33 percent) were contamination advisories.[42] Precipitation in the summer of 2024 was approximately 5 percent greater than the previous 60-year average, and the impact of combined sewer overflows (CSOs) and sanitary sewer overflows (SSOs)(see above) were likely the reasons for the increase in beach action days in 2024. The chart above displays both closings and advisories at Connecticut's public coastal beaches since 2014, which from a water quality perspective are functional equivalents. The beach-specific advisories or closings are issued by the reporting state or local government entity.

Goal: The goal for keeping beaches open is to reduce the number of beach closings in half by 2035 from 2014, with the number for 2014 calculated using a five-year rolling average.[43]

Because the number of beaches varies by county, the Council utilizes a ratio of beach action days (closures and advisories) to the number of reporting beaches in each county to illustrate the relative impact that pollution has on coastal recreation waters. Typically, the western half of Connecticut's coastline, which has more impervious surfaces, sees the most beach actions.





Inland Beaches:** There are currently 17 state parks with designated swimming areas. From the start of the 2014 beach season to the end of the 2024 beach season, there were 203 separate beach closures at these 17 swimming areas. The number of beach closures in 2024 was 46 percent less than the previous year (59) and 21 percent less than the previous ten-year average (40). 98 percent of those beach closings in 2024 were due to high bacteria levels, one percent due to cyanobacteria blooms; and one percent due to flooding or unsafe conditions.

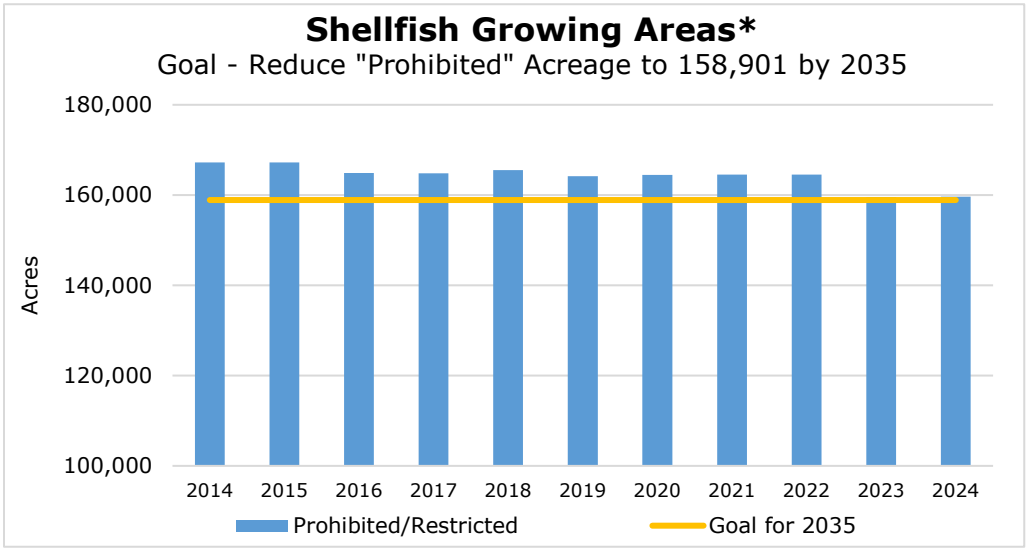
Technical Note: *****A beach action can include beach-specific advisories or closings issued by the reporting state or local governments. A beach action is recorded for a beach even if only a portion of the beach is affected. During a beach closure, water conditions are deemed unsafe for swimmers and other users. "Preemptory actions" (advisory/closure) that some jurisdictions issue are to inform the public of possible fecal contamination, based on past experience, prior to receiving from the laboratory a confirming water quality. **2018 - Wharton Brook swimming area closed for entire 2018 season - not reflected in the data provided; 2020 - Results impacted by COVID-19; 2024 - Indian Well swimming area closed for remainder of season due to flooding damage beginning on 8/18/24

Clamming and Oystering

QUICK SUMMARY:

- COMPARED TO LAST REPORT
- COMPARED TO 10 YR. AVERAGE
- ON TRACK TO MEET GOAL

Move your cursor over the globe to learn how climate change affects the data on this page, or click on it for more detailed information



The acreage of shellfish growing areas that are designated as "restricted", which includes: "prohibited", "restricted relay", and "conditionally restricted relay" was about the same as the previous year, but was approximately 5,000 acres less than the previous 10-year average. Changes in the classification of shellfish growing areas are usually related to improvement or decline in water quality, based upon the results of water quality monitoring and/or updated sanitary survey findings.[44] The Connecticut Department of Agriculture's (DoA) Bureau of Aquaculture (BoA) monitors water quality and classifies shellfish growing areas according to their potential for yielding healthful, uncontaminated shellfish. There are a total of approximately 390,000 acres of shellfish beds managed by the BoA.

Water quality assessment criteria for shellfishing as a designated use only applies to inner-shore, and mid-shore estuarine waters where shellfish growth is viable, which is approximately 50 percent of Connecticut's estuarine waters. Only about 20 percent of the estuarine waters identified as assessed in the 2022 Integrated Water Quality Report can fully support shellfish harvesting from Class SA waters.** Meanwhile, the percentage of estuarine waters that can fully support shellfish harvesting from Class SB waters remains unchanged from the 2020 report at approximately 62 percent.[45]

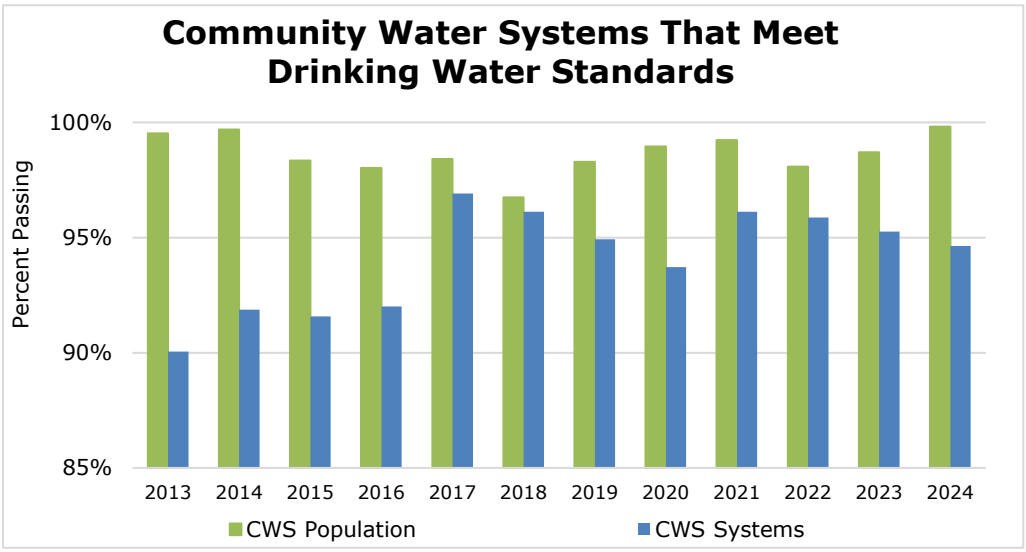
Goal: The goal for marine shellfishing is to "upgrade 5 percent of the acreage restricted or closed for shellfishing in 2014 by 2035" (2015).[46] The "restricted or closed" acreage in 2014 totaled 167,264 acres, which included areas designated by DoA as "prohibited", "restricted relay", and "conditionally restricted relay". Therefore, the goal is a reduction of restricted or closed acreage to 158,901 acres by 2035, shown on the chart as a gold horizontal line.

Technical Note: *The vertical axis in the chart above has been shortened, beginning at 100,000 acres rather than the customary zero. **SA waters allow shellfish harvesting for direct human consumption where authorized, whereas SB waters allow shellfish harvesting with depuration or relay where authorized. Depuration is the action or process of freeing something of impurities. In the case of shellfish, this usually means moving the shellfish to areas with better water quality.

Drinking Water

QUICK SUMMARY:
- COMPARED TO LAST REPORT
- COMPARED TO 10 YR. AVERAGE
- ON TRACK TO MEET GOAL

Move your cursor over the globe to learn how climate change affects the data on this page, or click on it for more detailed information



This indicator shows that in 2024, 99.81 percent of the population served by community water systems (CWS) and 94.64 percent of all CWS demonstrated full compliance with applicable drinking water standards, based on an annual average. Data for 2024 also indicates that the percentage of the population served by CWS that meet drinking water standards was greater than the previous ten-year annual average of 98.5 percent. However, the percentage of CWS meeting drinking water standards was lower than the previous ten-year average of 94.4 percent.[47] By far, the most common problem during 2024 in water systems was excessive levels of chloride. [48] Source water protection is important for ensuring the safety and quantity of drinking water supplies.

In June 2022, the Connecticut Department of Public Health (DPH) updated the "Drinking Water Action Level for Per And Polyfluoroalkyl Substances (PFAS) and renewed its recommendation to all public water systems (PWS) to test the water delivered to their customers for PFAS.[49] The Environmental Protection Agency (EPA)'s Fifth Unregulated Contaminant Monitoring Rule (UCMR 5) required PWS to sample for PFAS in their water supplies from 2024 to 2026. In 2024, 39 PWS (11 percent) completed their quarterly sampling requirements, with 19 having a "running annual average" of a PFAS above EPA's Maximum Contaminant Level (MCL). The EPA anticipated that approximately one-third of all systems will collect samples each year between 2023 and 2025; however, EPA may reduce the number of small systems that will be asked to perform monitoring.[50]

Over 80 percent of people in Connecticut are supplied by the public water systems, while the remainder of the population primarily relies on private wells, which are not monitored by any government agency and are not counted in this indicator. The DPH provides guidelines for testing of private wells.

Goal: The EPA's current strategic plan identified a goal to reduce the number of community water systems still in noncompliance with health-based standards since March 31, 2021, from 752 to 500 by September 30, 2026; however, it is unclear how many of these CWS are in Connecticut.[51]

Technical Note: *The vertical axis in the chart above has been shortened, beginning at 85 percent rather than the customary zero. The "Quick Summary" image above addresses CWS Population only. PFAS are a group of man-made chemicals that are widely used in various industrial and consumer products. Exposure to certain PFAS may lead to adverse health outcomes.

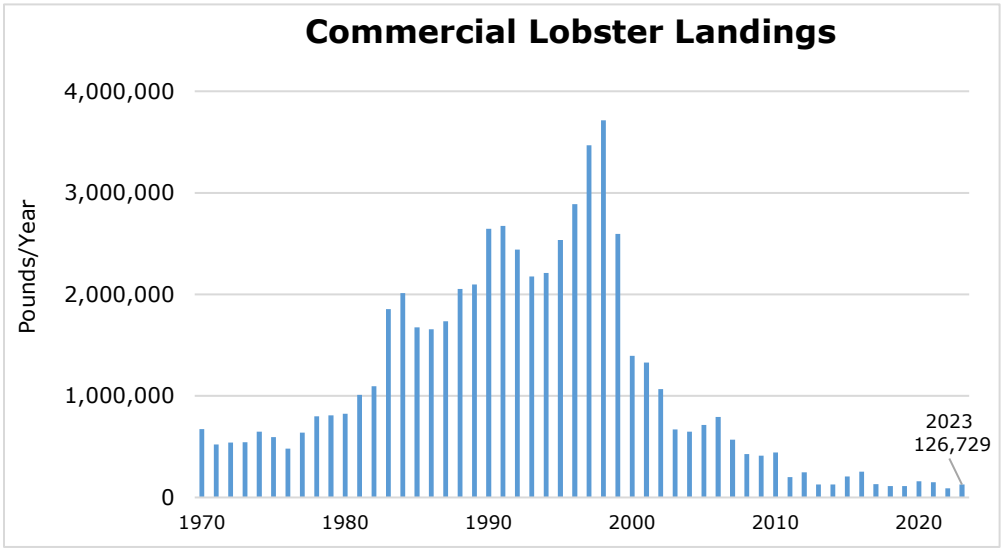
Lobster and Fishes of Long Island Sound

QUICK SUMMARY:

✓ COMPARED TO LAST REPORT
X COMPARED TO 10 YR. AVERAGE
— ON TRACK TO MEET GOAL

Move your cursor over the globe to learn how climate change affects the data on this page, or click on it for more detailed information





Lobster landings in the state have declined dramatically from a high of over 3.7 million pounds in 1998 to 126,729 pounds in 2023 (most recent data available). Lobster landings in 2023 increased by 26 percent from 2022 levels but was 13 percent less than the previous ten-year average.[52]

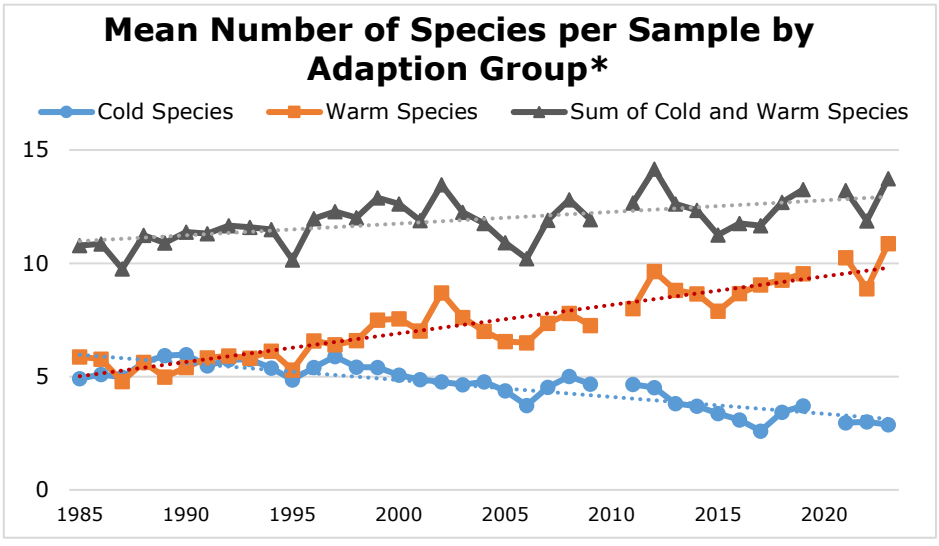
Researchers have investigated several possible causes for the dramatic downturn in lobster populations since 1998, including disease, changes in water quality, changes in climatic conditions and other human impacts to Long Island Sound, such as the presence of pesticides. The increase in water temperature might not negatively affect the availability of thermally suitable habitat; however, warmer temperature has been linked to the increased prevalence of epizootic shell disease, which weakens lobsters' shells.[53]

Marine Fish Survey:

QUICK SUMMARY:

✓ COMPARED TO LAST REPORT
✓ COMPARED TO 10 YR. AVERAGE
— ON TRACK TO MEET GOAL

The decline in lobsters was also confirmed by the Department of Energy and Environmental Protection's (DEEP) spring and fall trawl surveys, which recorded a geometric mean of approximately 0.01 lobsters per tow (fall) in 2023.



The chart above shows the mean number of fish species caught during the spring and fall surveys combined. The trends show that the average number of warm-adapted species increased while the average number of cold-adapted species decreased over time. The difference is particularly evident in the fall when water temperatures are highest. Although overall finfish diversity in the Sound remains high, the composition of the finfish community is changing in favor of species tolerant of warmer temperatures.[54]

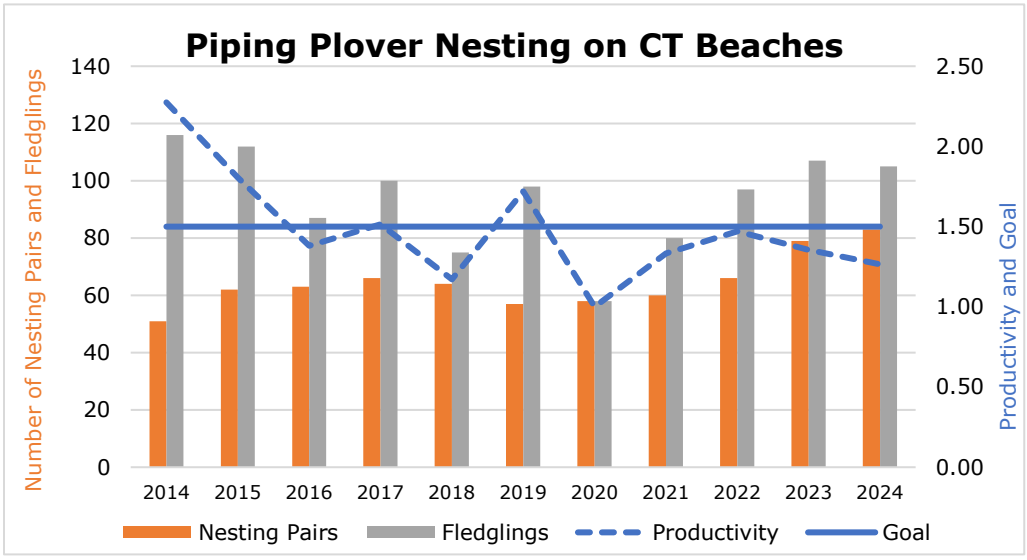
Technical Note: *Data from 2010 and 2020 are missing for the marine species chart because no fall and/or spring surveys were conducted during those years. Finfish species captured in the Connecticut DEEP Long Island Sound Trawl Survey were divided into adaptation groups based on their temperature tolerance and seasonal spawning habits.

Piping Plovers

QUICK SUMMARY:

X COMPARED TO LAST REPORT
X COMPARED TO 10 YR. AVERAGE
— ON TRACK TO MEET GOAL

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Piping plovers are small shorebirds that nest only on sandy beaches with sparse vegetation. In 2024, piping plovers in Connecticut raised an average of 1.27 chicks per nest. While productivity was good in 2024, it was less than last year (1.35), and less than the goal and the previous ten-year average (1.5). In 2024, 83 nesting pairs successfully raised 105 young plovers (fledglings) on Connecticut's beaches. Scientists estimate that each pair must successfully raise an average of 1.20 young per year to maintain a stable population and an average of 1.50 young per year to successfully increase the population of piping plovers to sustainable levels. Since protection and monitoring efforts began in 1984, nesting success has generally improved, resulting in more returning adults in subsequent years. 2024 was a noteworthy year for piping plover in Connecticut:

- it is the 40th year that DEEP has been monitoring this species;
- had the highest number of pairs since monitoring began in 1984;
- had the second highest number of fledged chicks (2023 was the highest with 107); and
- there was one new breeding site in the state.[55]

Public Act 23-155 allows the Commissioner of the Department of Energy and Environmental Protection (DEEP) to establish a seabird and shorebird protection program, including the designation of protected areas on state-owned public property within the state's coastal area and penalties for disturbing such designated areas.

The piping plover population is, according to the United States Fish and Wildlife Service (USFWS), "an indicator of the health of the fragile beach ecosystem."[56] Their habitat is a narrow strip squeezed between a rising Sound and higher ground. If their habitat is able to migrate upslope and inland in response to sea level rise, breeding areas could increase. However, habitat loss is anticipated on 45 percent of sandy ocean beaches that are already developed.[57]

Goal: The goal for piping plover was derived from the Piping Plover Atlantic Coast Population Revised Recovery Plan (1996). That Plan's goal calls for 2,000 pairs along the east coast with 625 pairs throughout New England, and a five-year average productivity of 1.5 fledged chicks per pair.

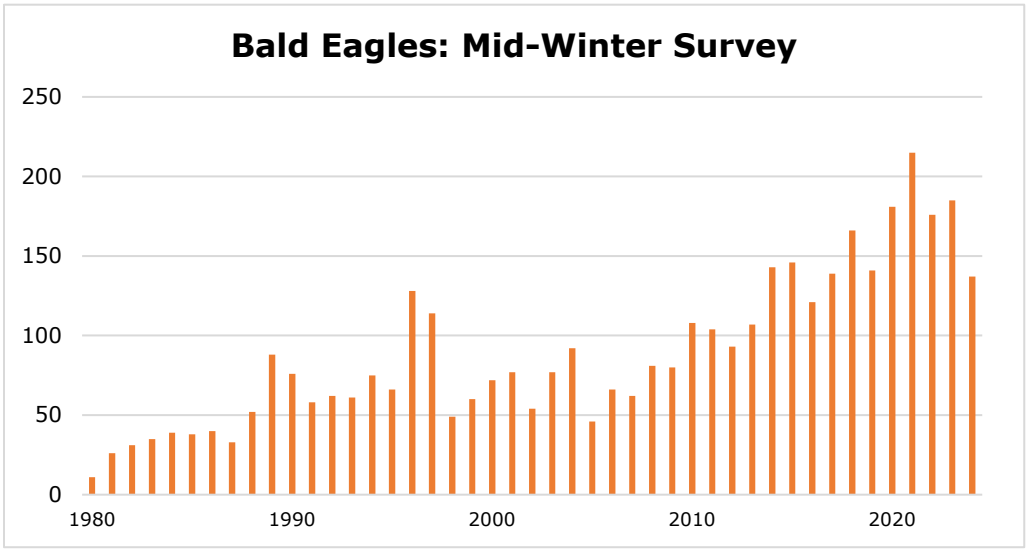
According to the U.S. Fish and Wildlife Service's 2019 Atlantic Coast Piping Plover Abundance and Productivity Estimates, there were 2,008 breeding pairs along the Atlantic coast, with over 980 breeding pairs in New England![58] Currently, the New England Recovery Unit or region is the strong-hold for the Atlantic Coast population of piping plovers.

Raptors

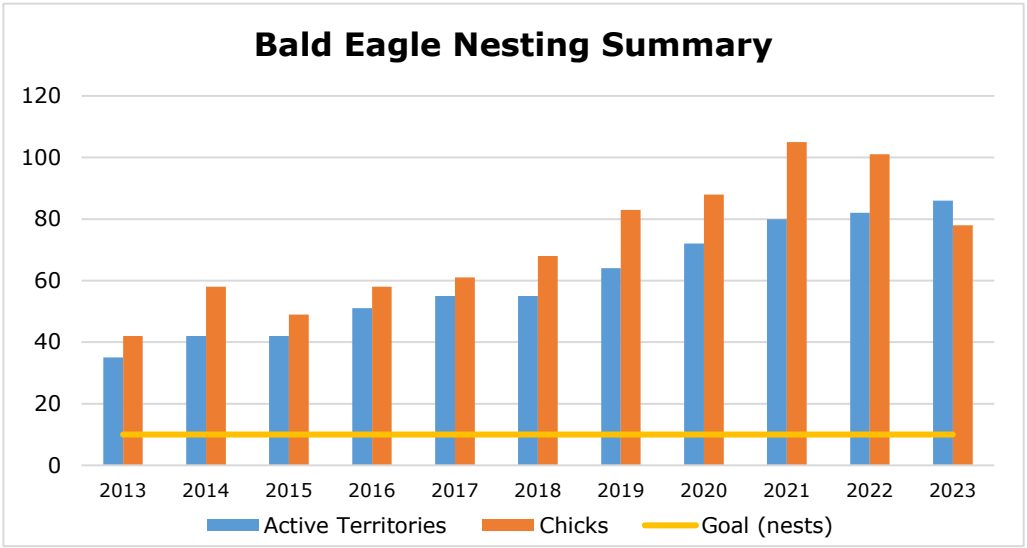
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X COMPARED TO LAST REPORT
X COMPARED TO 10 YR. AVERAGE
— ON TRACK TO MEET GOAL

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The 2024 mid-winter survey in Connecticut recorded 137 eagles throughout the state. Since 1980, observation trends of eagles during the Midwinter Eagle Survey have increased significantly. However, the number of eagles recorded in 2024 was twenty five percent less than in 2023 and approximately 15 percent less than the previous ten-year average. Variation in bald eagle observations can be attributed to the survey event occurring once a year, as well as differences in volunteer numbers and weather conditions.[59]



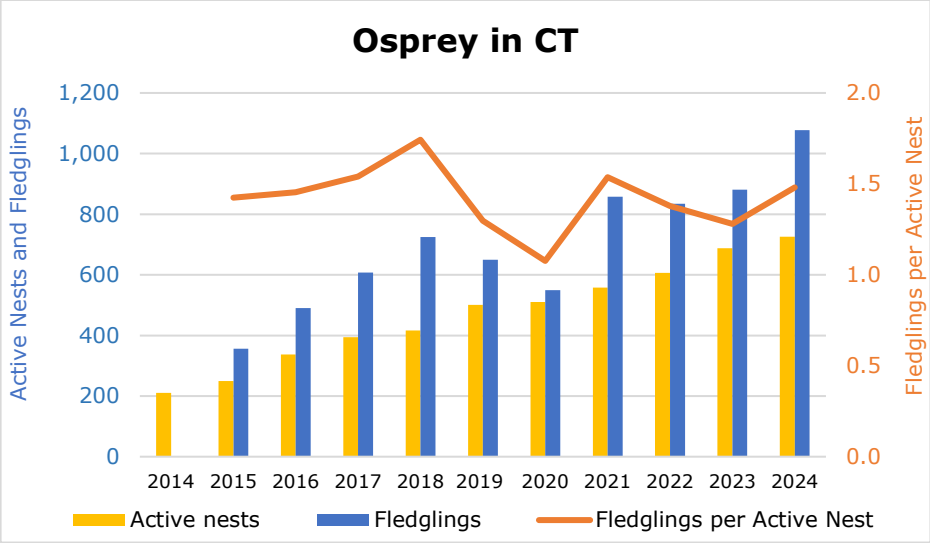
In 2023 (most recent data), there were 86 bald eagle active territories in the state, which represents an increase of approximately 4.9 percent from the previous year. The number of confirmed chicks decreased in 2023 to 78; however, there were 24 nests where the success of the nest or number of chicks is unclear*. There are several possible reasons why nesting outcomes might be unknown. Most notably, there are nearly a hundred nests distributed around the state, some with limited access, and the relevant information needs to be collected in a very narrow window of time.[60]

Goal: The goal for bald eagles is derived from the 1983 Northern States Bald Eagle Recovery Plan, prepared by the United States Fish and Wildlife Service. The Plan established a goal of 20 breeding birds (10 nests) for Connecticut. According to experts in the Bald Eagle Study Group, Connecticut could eventually host up to 200 nesting eagles (100 nests).

Osprey:

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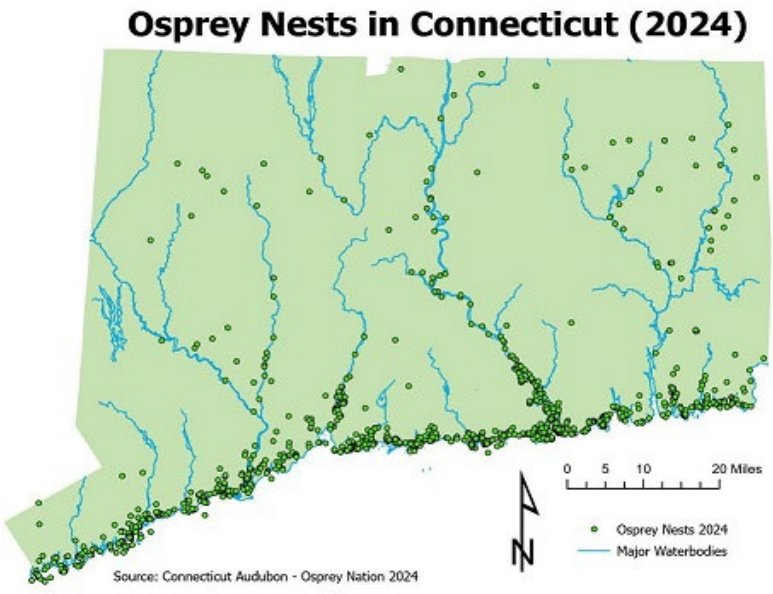
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— ON TRACK TO MEET GOAL



Another large fish-eating bird, the osprey**, has rebounded in similar fashion to the eagle. From a low of nine nesting pairs in 1974, more than 726 nests occupied by osprey were counted by the Connecticut Audubon Society in 2024. The active nests produced 1,077 observed fledglings, which resulted in a productivity rate of 1.48 fledglings per active nest.[61]

Goal: There is no established goal for ospreys in Connecticut, but ospreys, like eagles, are a "sentinel species," meaning their health indicates the health of the environment around them.

Osprey, also known as the "fish hawk," feed primarily on fish; consequently, osprey nests are typically located along the Connecticut shore or proximate to water.



Technical Note: *Territories are resource areas used by eagles that have only one active nest. **Data on fledglings for osprey for 2014 was not available. Osprey counts in 2020 might have been affected by the COVID 19 pandemic and might not be complete.

Forest Birds

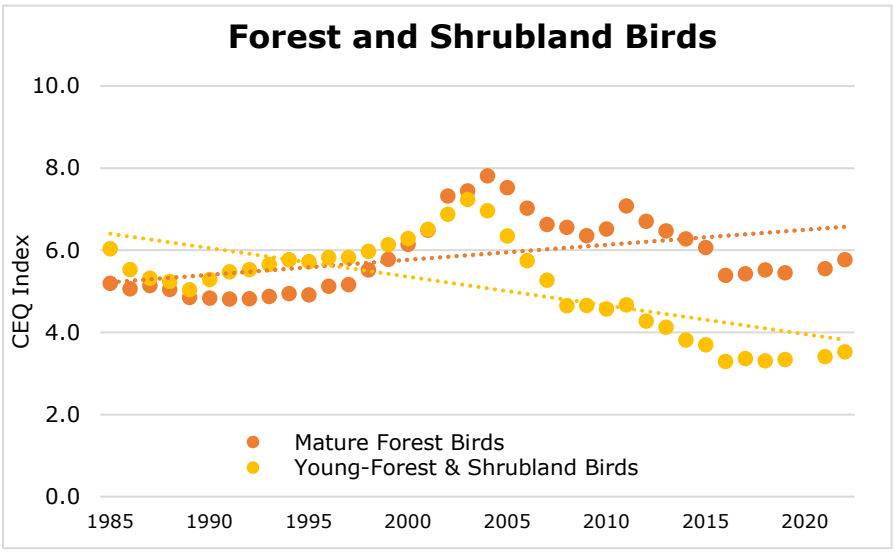
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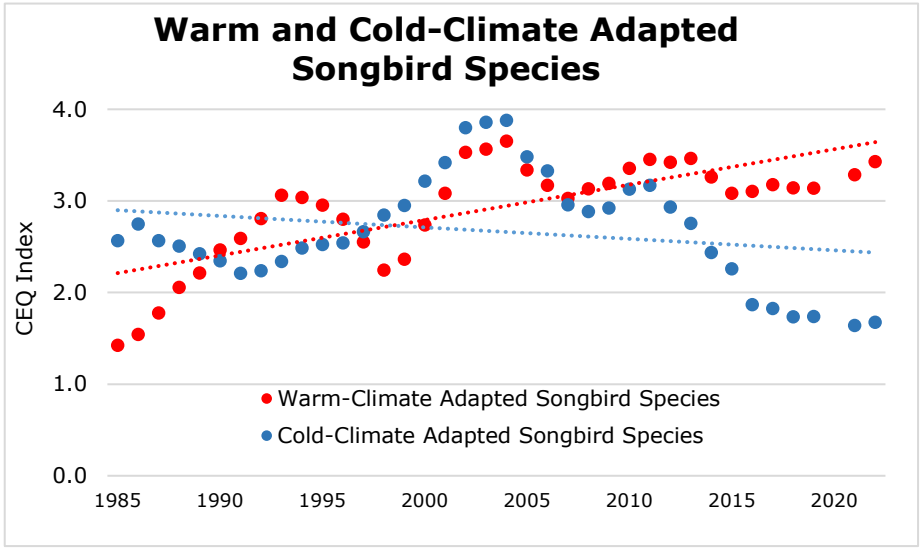
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The population trend of songbird species that typically inhabit mature forests has increased over the last 35 years while the population trend of songbird species that typically inhabit forests that are young, generally less than 20 years old, or dominated by shrubby vegetation, sometimes known as "shrublands", has declined over the last 35 years. As the amount of young forest and shrubland habitat has declined in Connecticut, so have the wildlife species that depend on it. However, the trend for both songbird species groups have generally declined since 2004. Most of the mature-forest bird species are affected greatly by forest fragmentation. Predators, invasive species, overpopulating deer, human activities and other intrusions into the forests can cause nesting success to falter. The true forest birds, those that are not adapted to disturbed roadside or suburban habitat, will succeed in the long term only in forests that are not fragmented.



Historic data indicate that the composition of Connecticut's songbird population is changing. Over the last 35 years, the trend for songbirds that prefer warmer climates has been increasing, while the trend for cold-adapted songbird species has been declining, based on the CEQ index. The CEQ index is used to assess the presence and abundance of a total of eighteen warm-climate adapted and cold-climate adapted songbird species.[62]

Goal: The goal for a variety of landbird species identified in the Partners in Flight Landbird Conservation Plan 2016 is to prevent further decline, stabilize populations in the short-term, and then reclaim a portion of their populations within 30 years.

Technical Note: The Council calculates index values (using advice from statistics experts) to show the combined population trends of certain mature forest birds and certain bird species that typically inhabit forests that are young or dominated by shrubby vegetation. Survey data were not available for 2020.

State-Listed Species

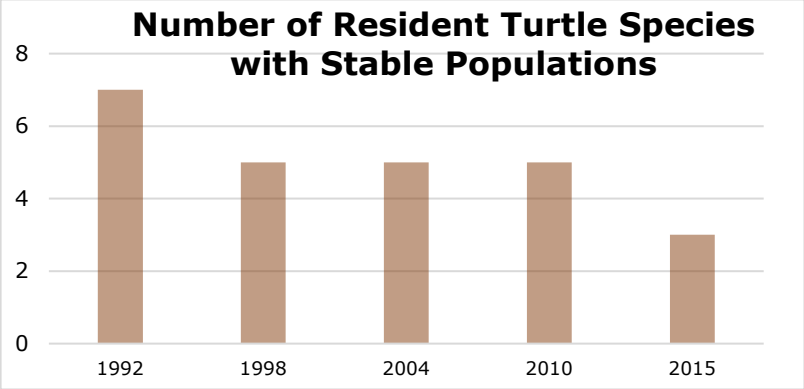
Resident Turtles:

QUICK SUMMARY:

— COMPARED TO LAST REPORT

XX COMPARED TO 10 YR. AVERAGE

XX ON TRACK TO MEET GOAL



Five of the eight turtle species that live in Connecticut year-round are listed as endangered, threatened, or of special concern. Turtles are excellent indicators of ecological health. Resident turtles include the eight species of turtle that live in Connecticut (but not the four marine species that visit Long Island Sound in the summer, all of which are threatened or endangered). In 2015, five of the eight resident turtle species were listed as endangered or of special concern: bog turtle (endangered), eastern box turtle, wood turtle, northern diamondback terrapin, and spotted turtle (species of special concern).[63] Turtle species in Connecticut have declined, in part, because of poaching, and the degradation, loss and segmentation of their habitat. The ability for turtles to sustain a stable population will be difficult because turtles take a long time to reach sexual maturity and have low survivorship when newly hatched. While Connecticut General Statutes (CGS), Section 26-307 requires the Department of Energy and Environmental Protection (DEEP) to review, **at least every five years**, the designation of species as endangered, threatened or of special concern, the state-listed species list hasn't been updated since 2015.

Goal: Pursuant to CGS, Section 26-303, it is a policy of the state to conserve, protect, restore and enhance any endangered or threatened species and essential habitat.

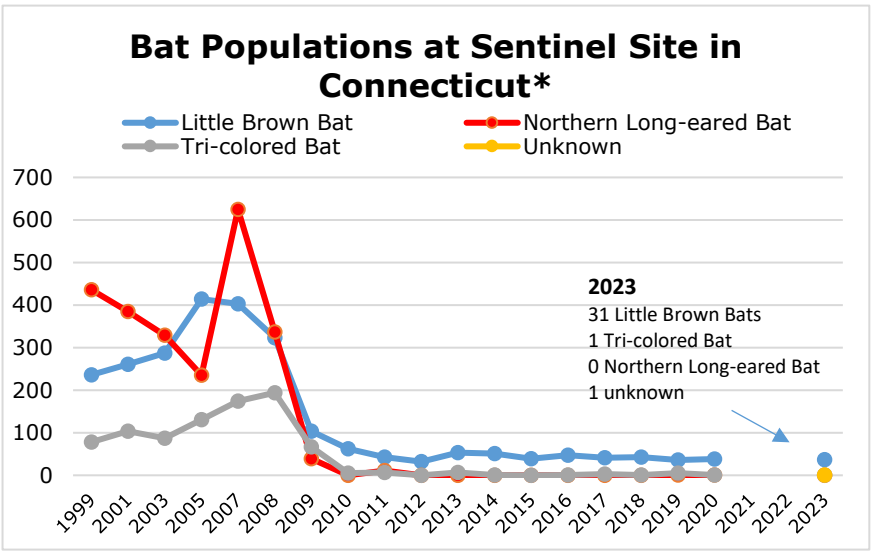
Bats:

QUICK SUMMARY:

— COMPARED TO LAST REPORT

XX COMPARED TO 10 YR. AVERAGE

XX ON TRACK TO MEET GOAL



Eight of the nine bat species are on the latest list of species that are endangered, threatened, or of special concern. Bat populations in Connecticut have experienced a catastrophic decline that led to the classification in 2015 of three more bat species as endangered in Connecticut and has raised concerns about the future of bats in the state. The sharp decline in bat population between 2007 and 2010 is primarily due to an epidemic fungal disease called white-nose syndrome (WNS). Other factors that might impact bat populations include climate change and habitat loss. The chart depicts data for the winter population of three cave-dwelling bat species at a sentinel hibernation site monitored by DEEP.[64] The United States Fish and Wildlife Service (USFWS) reclassified the northern long-eared bat (NLEB) as endangered under the Endangered Species Act. Effective March 31, 2023.[65] On September 13, 2022, the USFWS announced a proposal to list the tricolored bat as endangered under the Endangered Species Act.[66]

Goal: The goal for bats is for recovery of all nine species to a stable, sustainable population.

Technical Note: *The horizontal axis for bats displays every other year between 1999 and 2007. There were no hibernacula entries in 2021, 2022, and 2024. Bats are important predators of night-flying insects.

Invasive Disruptors

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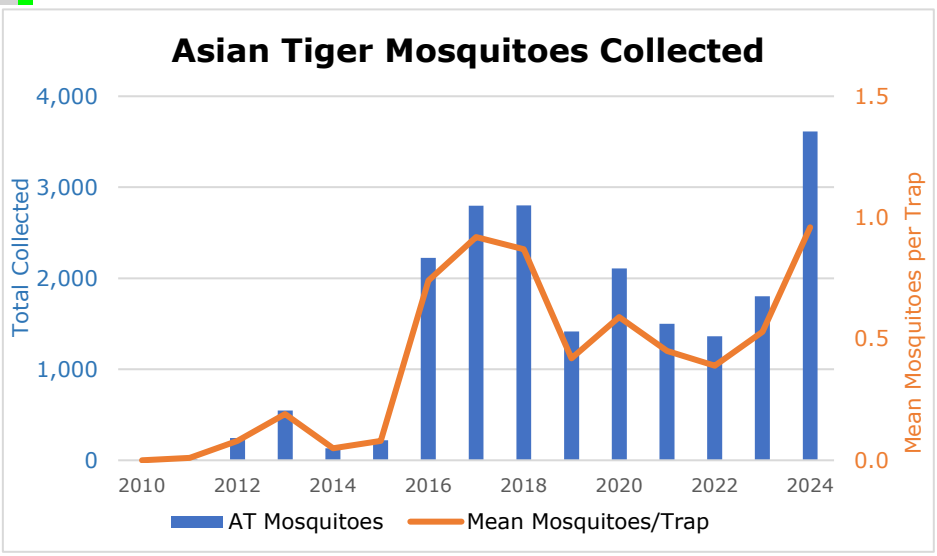


Invasive species are species that are not native to Connecticut that exhibit an aggressive growth habit and can out-compete and displace native species. It is expected that more invasive species, both plant and animal, will arrive, become established, and flourish as a consequence of the warming climate that is making Connecticut more hospitable to species that do not tolerate cold weather. Further, climate induced stress, rising temperatures, and extreme weather in an ecosystem can facilitate invasive pathways. The adverse impacts of invasive species affect all the state's ecosystems, including its waterways, natural lands, working lands and developed landscapes. In addition, the economic and human health costs of unchecked invasive species can be high. In 2022, the Council completed an update *("INVASIVES": PREVIOUSLY DESCRIBED and NEWLY ARRIVED*) to the Council's 2002 report, *Great Infestations,* that included recommendations for the control of invasive species in Connecticut. Preventing invasive species from taking over and disrupting Connecticut's landscapes and waterways requires advanced planning, vigilance, maintenance, coordination and prioritization of the expenditure of human energy and of public funds. Some examples of invasive species are discussed below but there are many more.

Asian Tiger Mosquitoes:[67]

QUICK SUMMARY:

X COMPARED TO LAST REPORT
X COMPARED TO 10 YR. AVERAGE
— ON TRACK TO MEET GOAL



In 2024, a record high number of Asian tiger mosquitoes (ATM) were collected* and this species was detected at the highest number of mosquito trapping sites (56 out of 108). The increase in ATM in 2024 was likely due to mild winter temperatures, which enhanced the overwintering success of ATM eggs, in combination with warm, wet spring conditions. Highest adult collections of ATM were obtained from locations in densely populated urban and suburban communities in Fairfield and New Haven counties, and ATM was observed to spread geographically northward in 2024 than in previous years. Connecticut is expected to get warmer and wetter over the coming century, potentially increasing mosquito populations by creating more suitable habitat. Additional information about mosquito management in Connecticut can be found on the Department of Energy and Environmental Protection's (DEEP) website or the Connecticut Agricultural Experiment Station (CAES) - portal.ct.gov/CAES.

Invasive Plants:

Pursuant to Public Act 24-11, on or after October 1, 2024, no person shall import, move, sell, purchase, transplant, cultivate or distribute any of the following invasive plants: (A) Porcelain berry (Ampelopsis brevipedunculata), (B) mugwort (Artemisia vulgaris), (C) quackgrass (Elymus repens), (D) Japanese angelica tree (Aralia elata), (E) Japanese wisteria (Wisteria floribunda), and (F)

Chinese wisteria (Wisteria sinensis).The new legislation also included a provision that, on or after October 1, 2027, no person shall import, move, sell, purchase, transplant, cultivate or distribute callery pear (Pyrus calleryana).

Hydrilla:



The highly invasive aquatic plant, *Hydrilla verticillata*, known commonly as 'hydrilla' or 'water thyme' was first detected in the Connecticut River in 2016 around Glastonbury, Connecticut and has since spread into the river's many coves, tributaries, and boat basins. Hydrilla is an aquatic plant that has earned the title "world's worst invasive aquatic plant". The United States Army Corps of Engineers (USACE), New England District and the Engineer Research and Development Center (ERDC) is leading a demonstration project to determine the effectiveness of registered herbicides to safely reduce and control the spread of the Connecticut River hydrilla. Research on hydrilla's growth patterns, water exchange dynamics in the Connecticut River, and herbicide efficacy in laboratory conditions began in 2023 to guide operational scale field demonstrations of herbicide efficacy. In 2024, permitting was completed and treatments were performed at five demonstration sites on the Connecticut River. In 2025, the USACE might be monitoring treated sites and conducting assessment(s)/treatment of additional sites.[68] Additional information about the hydrilla in Connecticut can be found on the CAES website - portal.ct.gov/caes/oais/connecticut-river-project.

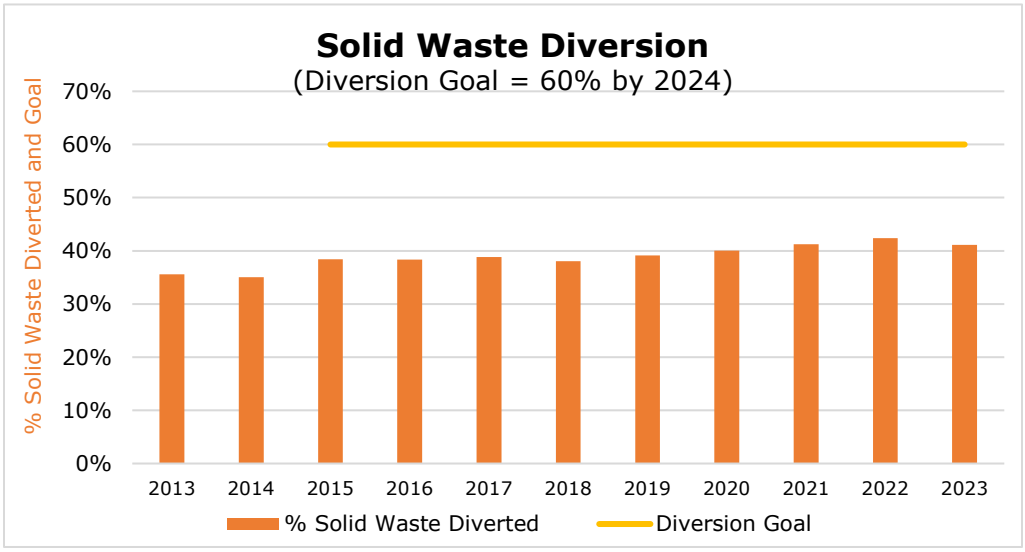
Technical Note: *Collection data for mosquitoes for 2016-2018 has been modified from previous reports because of the introduction of new data from a trapping site in Bridgeport. From2010 through 2019, CAES collected mosquitoes at 92 sites statewide, and from 2020 through 2024 the number of collection sites increased to 108 statewide. Information on other invasive species can be found in the Council's 2022 special report *("INVASIVES": PREVIOUSLY DESCRIBED and NEWLY ARRIVED)*.

Waste Diversion

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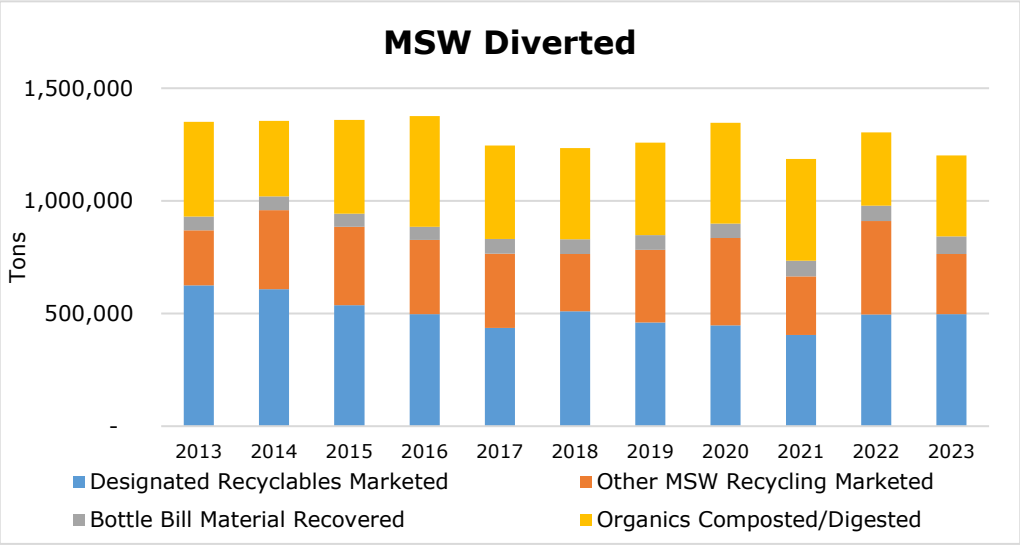
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- ✗ ON TRACK TO MEET GOAL

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In 2023, (most recent data available) approximately 41.1 percent of the state's solid waste was diverted* from disposal. The amount (tonnage) of solid waste diverted in 2023 was three percent lower than last year, but six percent greater than the previous ten-year average. Approximately 1.3 million tons of the state's solid waste were disposed of at one of the resource recovery facilities (RRF) in the state, while approximately 850,000 tons were transported out of state for disposal.[69] With the closure of the Material Innovation and Recycling Authority's RRF in Hartford in July 2022, and limited capacity for additional material at the other in-state RRFs, it is expected that the in-state capacity deficit to manage the state's solid waste will continue in the near term.

Goal: The diversion goal of 60 percent by 2024 was established with the adoption of Public Act 14-94 and is identified in *Connecticut's 2016 Comprehensive Materials Management Strategy*, *The Connecticut Solid Waste Management Plan*.



In 2023, approximately 497,000 tons of designated recyclables, 267,000 tons of "Other MSW Recycling", 360,000 tons of organics, and an estimated 77,000 tons recovered through the beverage container redemption program were sent to end markets and reuse facilities or composted/digested. There was a 36 percent decline in 2023 for "Other MSW Recycling Marketed" tonnage from 2022, which is attributed primarily to the amount of recycled wood reported.[70]

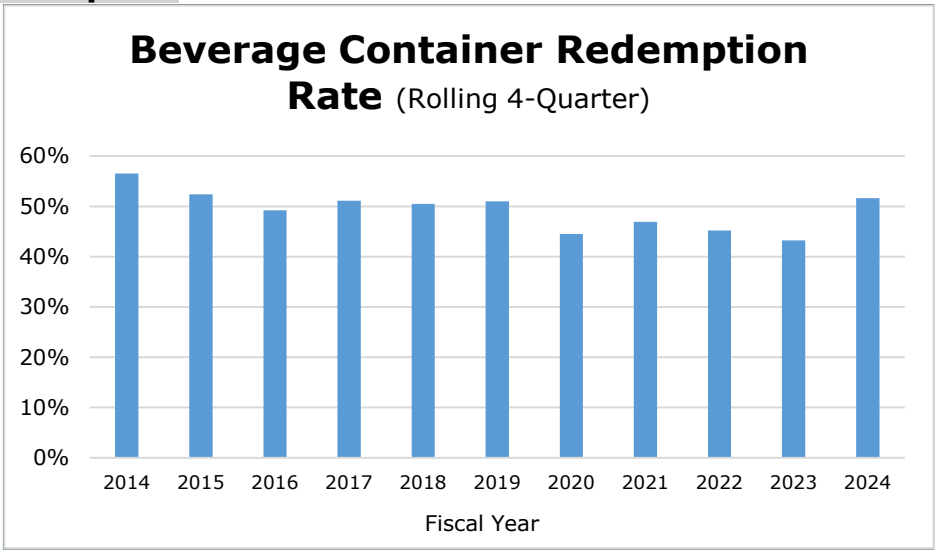
Beverage Container Redemption:

QUICK SUMMARY:

✓ COMPARED TO LAST REPORT

✓ COMPARED TO 10 YR. AVERAGE

— ON TRACK TO MEET GOAL



The rolling 4-quarter redemption rate in Connecticut in fiscal year (FY) 2024 was 51.6 percent, which was higher than in FY 2023 (43.2 percent), reversing the trend of decline for more than a decade.[71] The redemption rate for FY 2024 was also greater than the ten-year average of 49.1 percent. In the Council's 2020 special report, *Low Deposit, Low Return*, the Council recommended ways to increase the redemption rate and divert more beverage containers from disposal. Public Act 21-58 revised the beverage container redemption program with several provisions, including 1) an increase in the handling fee paid to retailers and operators of redemption centers; 2) an expansion of the types of beverages covered to include several new item categories, such as sports drinks, energy drinks, and juices, which began on January 1, 2023; and 3) an increase in the deposit amount from $0.05 to $0.10, which began on January 1, 2024. Public Act 24-2 prohibits a person from obtaining a refund value or handling fee for any empty beverage container that the person knows or has reason to know was not originally sold in this state or that was previously redeemed.

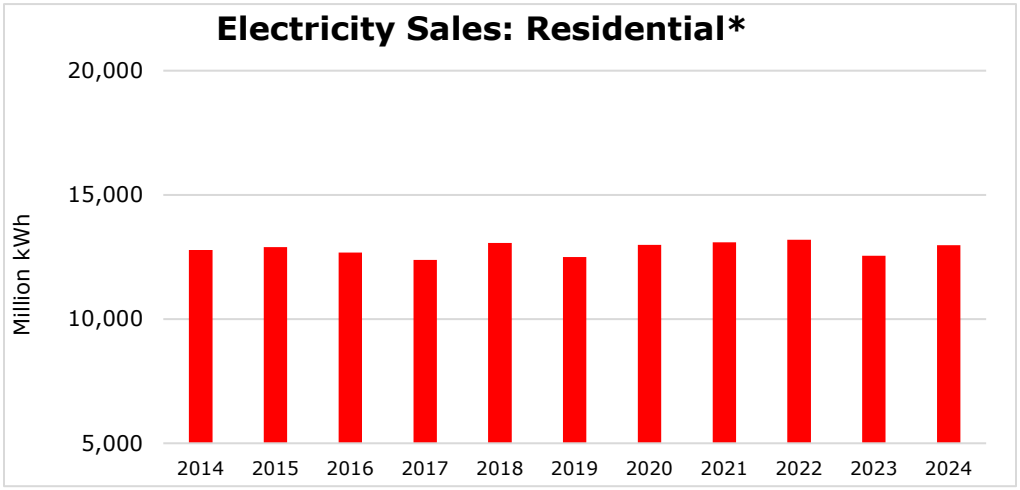
Technical Note: *Diversion includes the reduction of materials before entering the waste stream for disposal (i.e., reuse, recycling, composting). Estimated "Diversion" is based on the 2005 baseline of 3.8 million tons, which is a planning value taken from the Solid Waste Management Plan; it is not actual solid waste generation.

Electricity at Home and Work

QUICK SUMMARY:

- ✗ COMPARED TO LAST REPORT
- ✓ COMPARED TO 10 YR. AVERAGE
- — ON TRACK TO MEET GOAL

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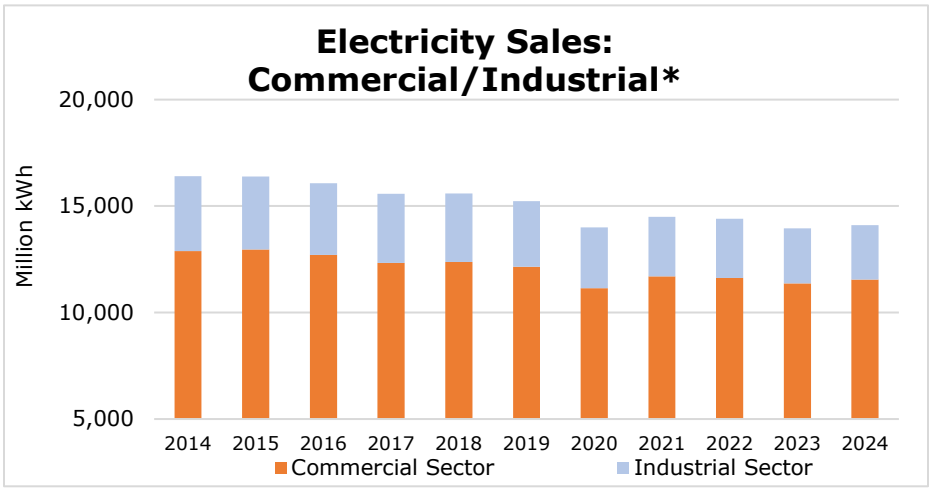
In 2024, the retail sales of electricity by the residential sector increased to 12,975 million KWh from 12,553 million KWh, an increase of 3.4 percent from 2023 and 1.3 percent from the previous ten-year average (12,810 million KWh).[72] The use of fossil fuels for electric generation increases air pollution, especially from less efficient/more polluting units used to meet peak demand. The increase in electricity purchases might be the result of higher-than-normal temperature resulting in more cooling degree days (CDD) and the number of days greater than 90°F (23); increases in electric vehicle registrations; and reductions in annual electricity conservation savings (see below). Typically, the hotter the summer, the more electricity is used by residents to cool their homes, which means more electricity that needs to be generated, and more greenhouse gas emissions that are potentially released to the environment.

Commercial/Industrial Purchases:

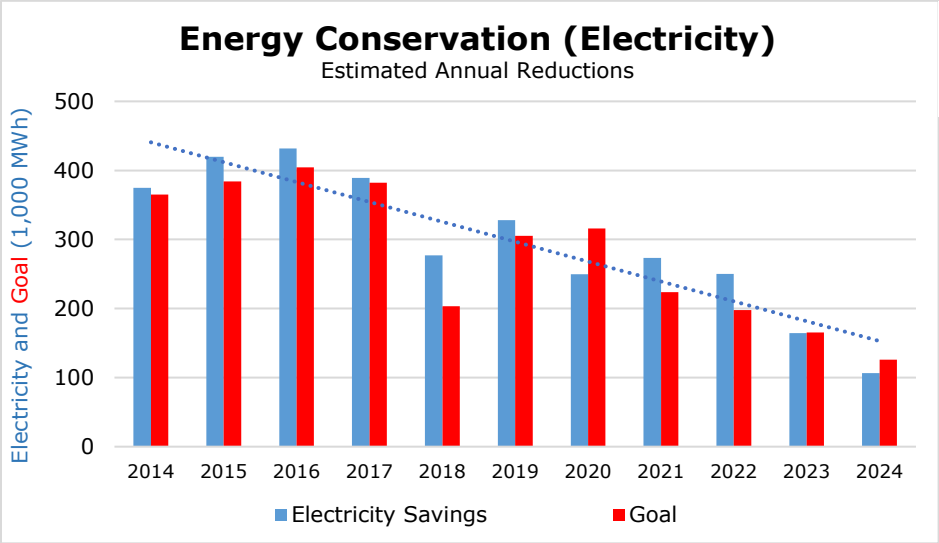
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In 2024, Connecticut's commercial and industrial sectors purchased approximately 14,100 million KWh. The purchase of electricity in the commercial and industrial sectors increased from 2023 levels by 1 percent, but was approximately 7.3 percent less than the previous ten-year average (15,214).[73]



Electric Conservation:



QUICK SUMMARY:

XX COMPARED TO LAST REPORT

XX COMPARED TO 10 YR. AVERAGE

— ON TRACK TO MEET GOAL

As mentioned above, reducing electricity demand, especially peak demand, is an effective strategy for reducing electricity generation and consumption, and the resultant air emissions from fossil fueled electricity generation. Estimated annual reductions of electricity consumption from efficiency measures in 2024 (106,533 megawatt hours (MWh)) was approximately 35 percent less than in 2023 (164,485 MWh), and 66 percent less than the ten-year average of 315,825 MWh.[74] While Connecticut's energy-efficiency programs have helped small and large businesses, homeowners and renters, and state and local governments better manage their energy use, the expenditure of funds (annual spending) for each MWh of electricity conserved (annual reductions) has increased significantly over the last ten years. The decrease in annual electricity reductions, depicted in the graph above, is mostly due to the lighting market being fully saturated with light-emitting diode (LED) lighting equipment. The result being that conservation measures have shifted to more comprehensive measures, and these measures tend to carry higher costs.[75]

The Independent System Operator for New England (ISO-NE) estimated that the incremental annual energy reductions, net of embedded expiring measures, is expected to decrease significantly over the next ten years.[76] Energy efficiency measures are important because residential and commercial buildings use approximately 74 percent of all electricity and 39 percent of all energy use in the United States. In Connecticut, the approximately 1.4 million households and 140,000 businesses together accounted for more than 70 percent of Connecticut's 750 trillion British thermal unit (Btu) of annual energy consumption.[77] Improving the energy efficiency of buildings is critical to lowering energy costs, strengthening resilience to extreme weather events, improving grid reliability, and making residential and commercial buildings more comfortable and affordable.[78]

Goal: Public Act 18-50 introduced a new policy of the state to reduce energy consumption by 1.6 million MMBtus (one million British Thermal Units), or "the equivalent megawatts of electricity," annually each year for calendar years commencing on and after January 1, 2020, through calendar year 2025. Specific goals for energy conservation (electric reductions) vary for each year based on a number of factors, including the proposed budget for conservation measures in a given year, as determined by the Connecticut Energy Efficiency Board and the Public Utilities Regulatory Authority.

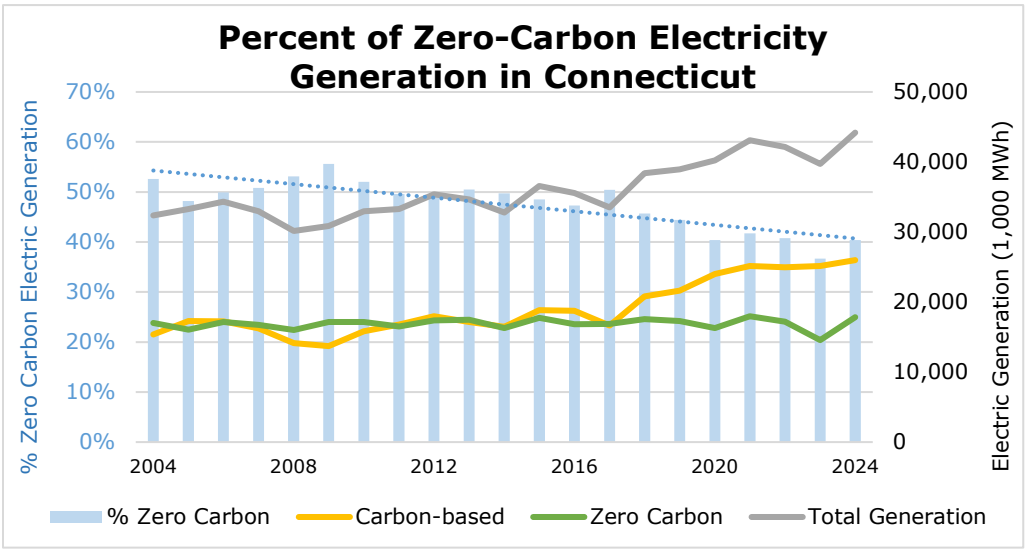
Technical Note: *The vertical axis in the charts above "Electricity Sales: Residential" and "Electricity Sales: Commercial/Industrial" have been shortened, beginning at 5,000 million kWh rather than the customary zero.

Zero Carbon Energy

QUICK SUMMARY:

✓ COMPARED TO LAST REPORT
X COMPARED TO 10 YR. AVERAGE
— ON TRACK TO MEET GOAL

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In 2024, 44,190 thousand megawatt-hours (MWh) of electricity was generated in the state by carbon-based fuel/technology (25,984 thousand MWH), and zero-carbon* technology (17,844 thousand MWh). The amount of zero-carbon electricity generated in the state comprised 40.4 percent of the total amount of electricity generated, which was a relative increase of 3.7 percent from 2023 (36.7 percent), but a relative decrease of 4.2 percent from the previous ten-year average (44.6 percent).[79] The amount of electricity from carbon-based generation increased from 2023 and was 22.3 greater than the previous ten-year average. Including out-of-state generation resources, it is estimated that in 2023 (most recent data available), approximately 57 percent of the electricity supplied to electric customers in the state was from zero carbon resources.[80]

Zero Carbon Goal - Consumption

On October 27, 2023, DEEP released Requests for Proposals (RFPs) for Offshore Wind Facilities and for Zero Carbon Energy to secure zero carbon resources that could improve the reliability of the region's electric grid and reduce GHG emissions.[81] However, the state chose not to procure any offshore wind capacity from proposals submitted in 2024, and instead selected proposals for 518 MW of new solar generation capacity (of which only 200 MW of capacity would be developed in the state) and 200 MW of energy storage capacity.[82] If the new and previous procurements of zero carbon resources are developed, it would eventually increase the amount of zero carbon energy available for the state's residents and businesses; however, it might still leave the state short of its zero percent GHG emission target by 2040. The shortfall is more likely if existing generation resources/units are retired and/or the projected increases in electric consumption for transportation (~2,600 gigawatt-hours by 2033)[83] and thermal (1,228 GWH and a peak winter demand of 609 MW by 2033)[84] are accurate. The use of intermittent renewable technologies will also require a significant amount of energy storage and/or upgrades to the electric transmission system.

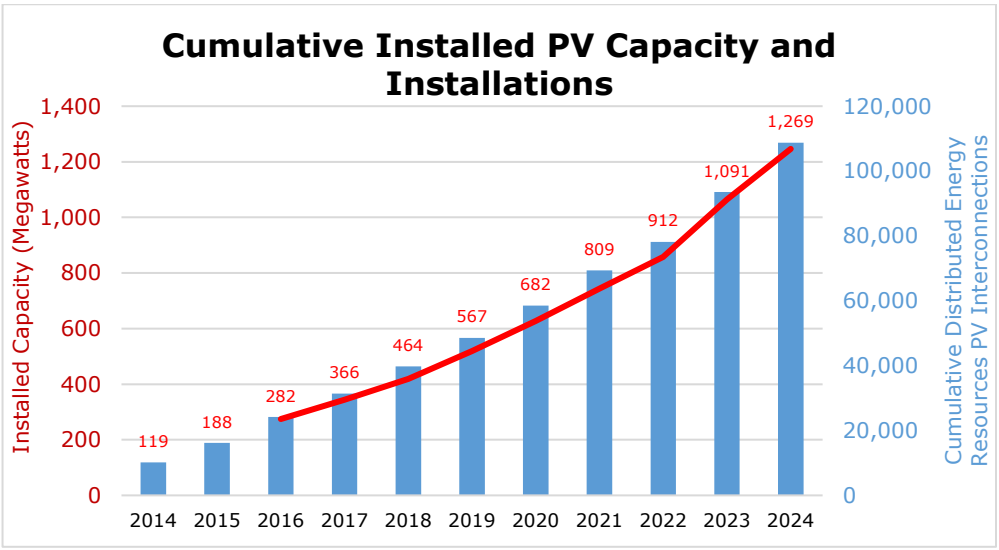
Goal: Connecticut General Statutes (CGS), Section 16-245a requires that a minimum percentage of electricity, which is sold to Connecticut customers, must be generated from renewable energy sources.[85] CGS, Section 22a-200a(a)(3) requires the reduction of greenhouse gas (GHG) emissions to a level of zero percent from electricity supplied to electric customers in the state by 2040.

Technical Note: *Includes utility scale renewables that generate no carbon and nuclear generation, and it is not the same as Class I or Class 2 renewable sources. Zero carbon generation does not include biomass (wood, municipal solid waste), fuel cells operating on natural gas, biogas, and landfill gas.

Solar Photovoltaics

QUICK SUMMARY:
- COMPARED TO LAST REPORT
- COMPARED TO 10 YR. AVERAGE
- ON TRACK TO MEET GOAL

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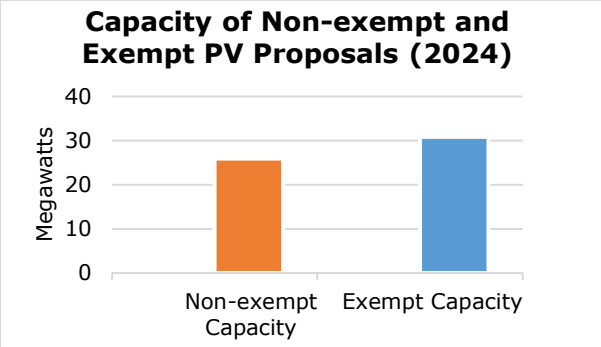


Thousands of Connecticut homes and businesses now use solar energy to generate much of their own electricity. In 2024, total installed Distributed Energy Resources (DER) solar photovoltaic (PV) capacity, for systems generally under five megawatts (MW) of capacity, exceeded 1,269 MWs at over 106,830 installations in the state.[86] On January 1, 2022, the new Residential Renewable Energy Solutions (RRES) program replaced the previous net metering and Residential Solar Investment Program, administered by the Green Bank, for residential renewable energy projects. The RRES program offers those with residential solar installations the opportunity to sell the energy produced and the renewable energy certificates (RECs) at a fixed 20-year price by selecting one of two incentive rate structures (tariffs).

The primary advantage of solar PV technology is that it produces electricity with zero emissions – no air pollution, wastewater, or significant noise at the point of electric generation. The 1,269+ MW of installed PV DER capacity in the state in 2024 is estimated to have produced more than 1.6 million megawatt-hours (MWh) of electricity, which could potentially have displaced over 432,000 metric tons of carbon dioxide equivalent (CO_2e) emissions.[87] The Independent System Operator for New England (ISO-NE) projects that a total of approximately 3,100 MW of solar PV DER capacity could be installed in Connecticut through 2034.*[88]

Public Act 24-31 included provisions to expand and study solar facility deployment in the state, by authorizing more capacity, subject to funding, for the Non-Residential Energy Solutions (NRES) program and the Shared Clean Energy Facility (SCEF) program, and requiring DEEP to include information on the potential siting of solar projects in the state in its next Integrated Resource Plan.

An issue with land-based solar PV installations, primarily utility scale installations, is the impact such development has on farmland, forests, shrublands, and the species that inhabit these ecosystems. As a result of citizens' concerns regarding the proliferation of land-based solar PV systems in Connecticut, the Council issued a special report in 2017, *Energy Sprawl in Connecticut*, that identified deficiencies in state policy regarding the selection and siting of land-based PV installations and made recommendations to ensure prime farmland and core forest habitats were better protected. In response to citizen concerns, Public Act 17-218 requires certain solar PV



projects, such as those with a proposed capacity greater than two MW that seek approval from the Connecticut Siting Council (CSC) by Petition for Declaratory Ruling, to acquire written confirmation, from the Departments of Agriculture and Energy and Environmental Protection that the subject proposal would not "materially affect" the status of such land as prime farmland or core forest. In 2024, there were 20 proposals for solar projects submitted to the CSC; twelve of those projects were exempt from the provisions of Public Act 17-218.[89]

Energy Storage:

To more efficiently manage electricity generated by intermittent renewable generation and to improve energy management and reliability, Public Act 21-53 requires the state to develop and implement one or more programs, and associated funding mechanisms, for electric energy storage resources connected to the electric distribution system. In 2022, the Connecticut's Public Utilities Regulatory Authority (PURA) launched a statewide electricity storage program (Energy Storage Solutions) for all Eversource Energy and United Illuminating (UI) residential, commercial, and industrial customers. The nine-year program, administered by the Connecticut Green Bank along with Eversource and UI, is expected to continue through at least December 31, 2030. In 2024, approximately 209 MWh of energy storage capacity was approved/completed throughout Connecticut, with the approved/completed capacity for the period 2022-2024 totaling approximately 380 MWh[90], which is estimated to be enough capacity to provide approximately 404,000 residential customers with electricity for one hour.

Goal: Connecticut General Statutes Section 16-243cc identifies three goals for the deployment of energy storage systems in Connecticut: 1) 300 MW by December 31, 2024; 2) 650 MW by December 31, 2027; and 3) 1,000 MW by December 31, 2030.

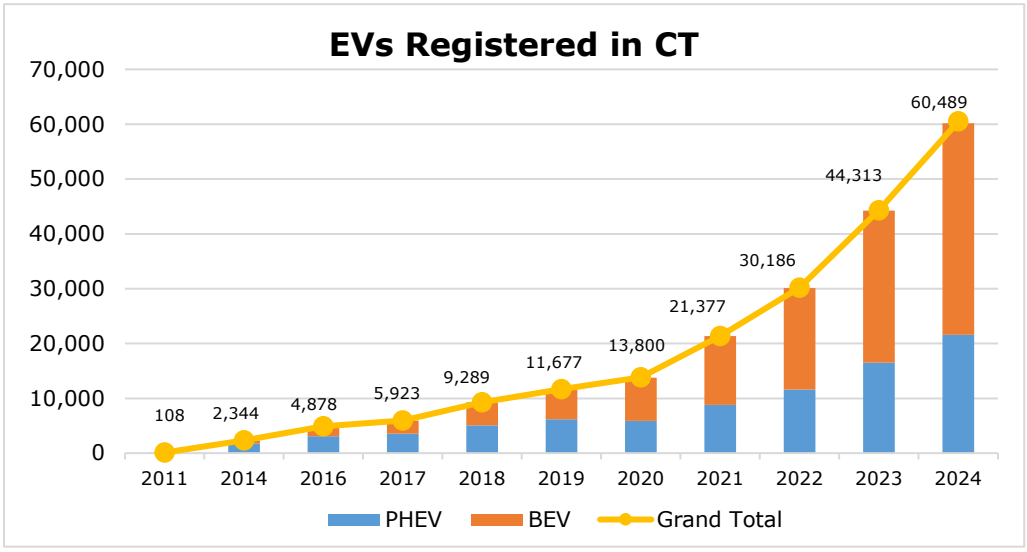
Technical Note: * Distributed Energy Resources (DER) refers to any generator or energy storage facility located on the distribution system, any subsystem thereof, or behind a customer meter that is capable of providing energy injection, energy withdrawal, regulation or demand reduction.

Transportation

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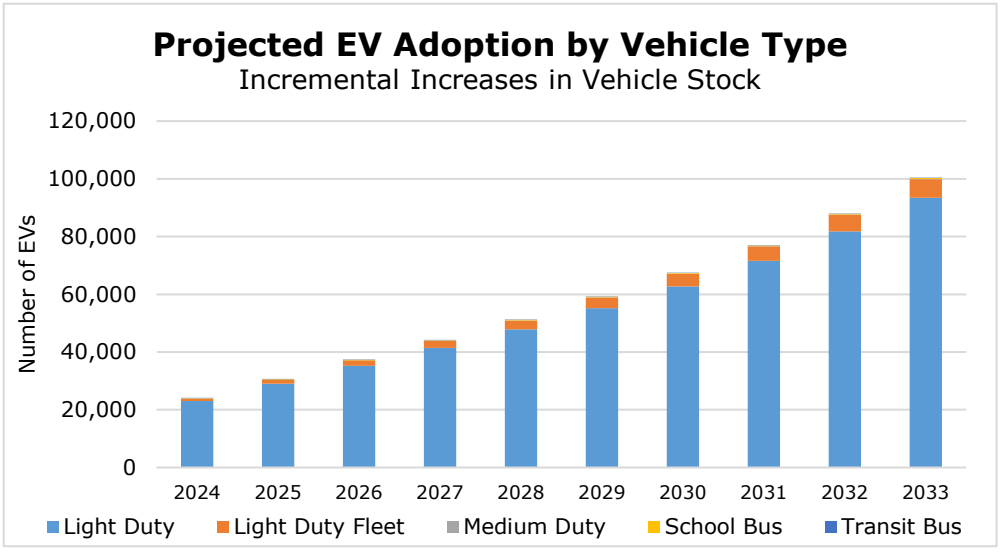
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The number of electric drive vehicles (EVs)* registered in the state increased by 16,176 from 2023 to 2024; however, the number of registered EVs represents approximately 5.5 percent of registered passenger vehicles and only 2.2 percent of all registered vehicles in the state.[91] Significant reductions of GHG emissions in the transportation sector are necessary and achievable by reducing the combustion of fossil fuels through increased fuel efficiency, use of mass transit, and use of EVs that operate on "clean" electricity or "green" hydrogen.

To support the projected adoption and use of EVs, electricity consumption is projected to increase by more than 2,600 gigawatt-hours, and winter peak demand is projected to increase by approximately 570 megawatts by 2033.[92]



In 2024, the Connecticut Department of Transportation (CTDOT) had nine EVs/hybrid vehicles and 41 electric buses, and the Connecticut Department of Administrative Services (DAS) had 43 EVs (including 19 EVs leased to the CTDOT), which represents approximately 1.2 percent of the DAS vehicle fleet. There was no increase in the number of EV leases by the DAS in 2024.[93]

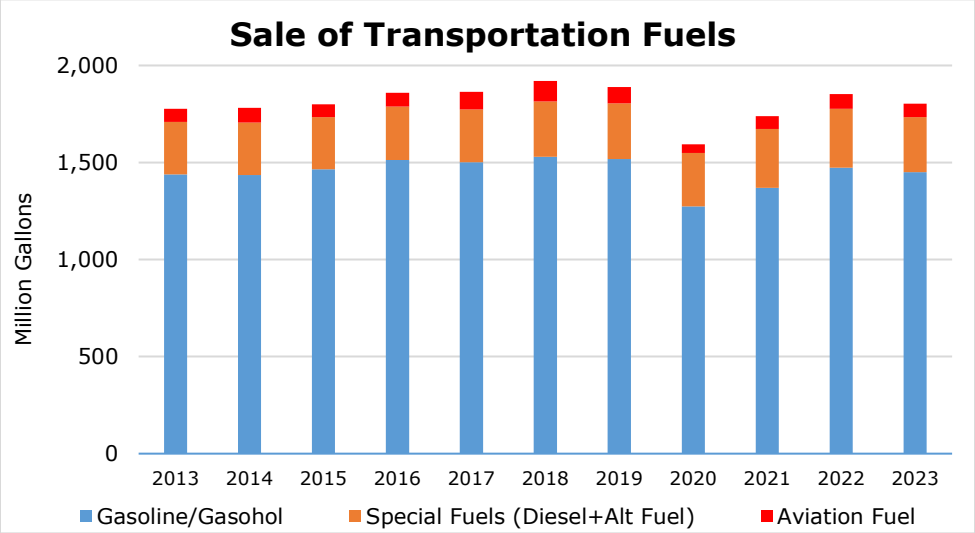
Goal: There is a 2020 goal for 125,000 EVs in Connecticut by 2025.[94] Public Act 22-25 requires that an increasing percentage of all cars and light duty trucks purchased or leased by the state be battery electric vehicles, increasing to at least 50 percent by 2026, at least 75 percent by 2028, and 100 percent by 2030.

Technical Note: *Electric drive vehicles (EVs) include plug-in hybrid electric (PHEV), battery electric (BEV), electric motorcycles, and fuel cell electric (FCEV) vehicles. Electric motorcycles and fuel cell electric vehicles are included in the "Grand Total" of EVs registered in the state, but are not depicted on the chart.

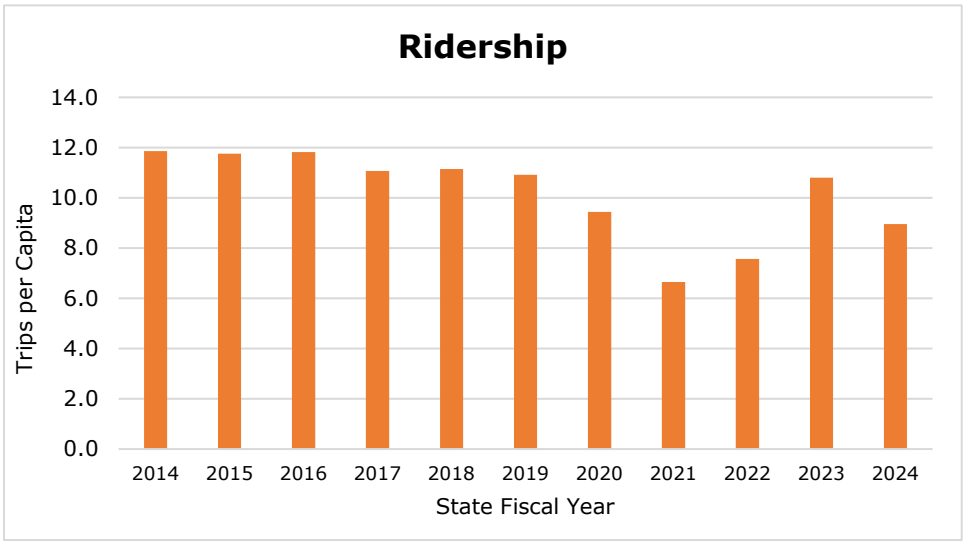
Transportation Fuels:

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In 2023, (the most recent available data) the sale of gasoline/gasohol in the transportation sector was approximately the same as the previous ten-year average; the sale of special fuels, which is primarily comprised of diesel, was 0.9 percent higher than the previous ten-year average;[95] and the sale of aviation fuels was approximately 7.4 percent lower than the previous ten-year average.[96] Overall, the sale of transportation fuel in 2023 was 2.7 percent lower than the previous year and 0.3 percent lower than the previous ten-year average. The effect of the pandemic is evident based on the decline of transportation fuel sold in the state in 2020 and 2021.



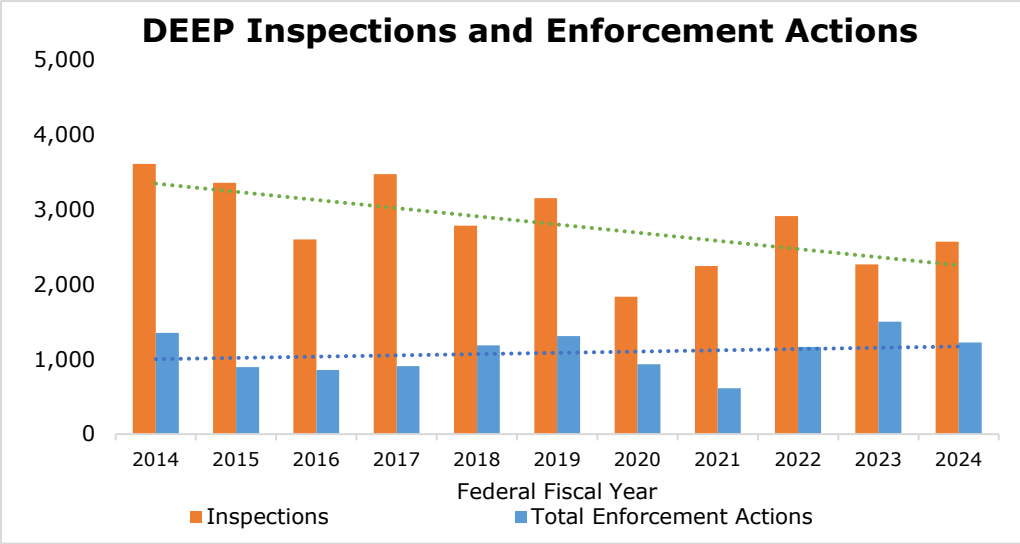
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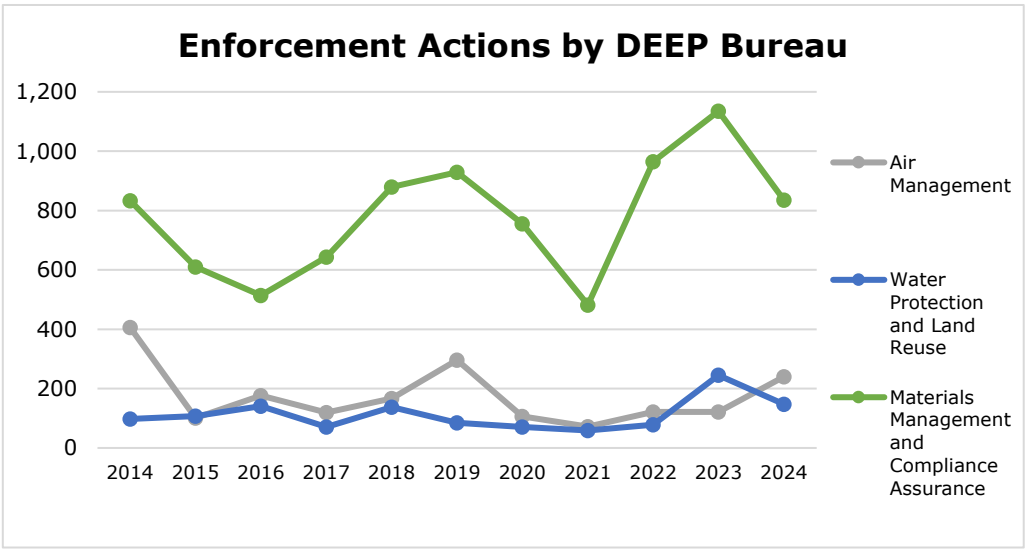
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In fiscal year (FY) 2024, total ridership (33 million passenger trips) on fixed route, commuter, and Americans with Disabilities Act (ADA) transit services decreased from FY 2023 (39 million passenger trips). In FY 2024, the average was nine passenger trips per capita, which is approximately 17 percent less than FY 2023 (10.8), and 13 percent less than the ten-year average (10.3).[97] Some reasons for the general decline in ridership in FY 2020 through FY2022, compared to previous years include the impact of COVID 19, alternate work arrangements (teleworking), and the success in ride sharing efforts. The decrease in ridership between FY2023 and FY2024 might be due to the end of the fare free program, which was in effect from April 1, 2022 through March 31, 2023.[98]

Compliance



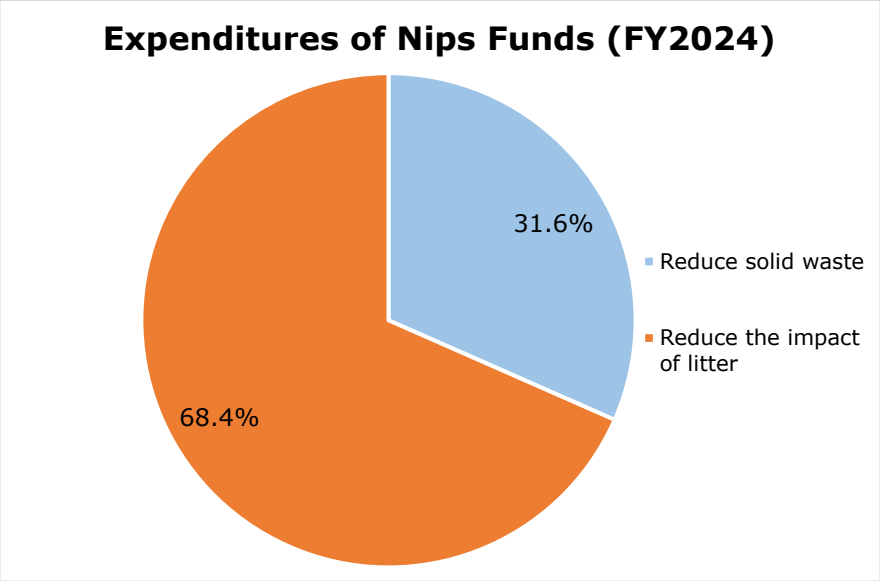
In the 2024 Federal Fiscal Year (FFY 24: October 1, 2023 – September 30, 2024), there were 2,570 inspections* performed by the Department of Energy and Environmental Protection (DEEP), an increase of approximately 13 percent more than the previous year but nine percent less than the previous ten-year average. In FFY 24, there were also 1,222 enforcement actions, which included 1,084 "Informal Enforcement Actions", consisting of Notices of Violation (NOV), Notice of Non-Compliance (NON), and warning letters; 121 "Formal Enforcement Actions"; and 17 "Referrals" to the Attorney General/Environmental Protection Agency. The Informal Enforcement Actions are enforcement tools, generally issued whenever DEEP detects one or more violations with a permit at a facility or a permitted use. Informal Enforcement Actions can be issued for minor or major violations; in cases of the latter type, the recipient might also receive an order, which might carry a financial penalty.



As depicted in the Enforcement Actions chart, the Bureau of Materials Management was responsible for 835 of the enforcement actions or approximately 68 percent of the total in FFY24. The Bureau of Air Management, which includes Radiation, was responsible for 240 enforcement actions that consisted primarily of 183 NOVs and 56 consent orders. The Bureau of Water Protection and Land Reuse was responsible for 147 enforcement actions that consisted primarily of 45 NONs and 83 NOVs.[99] The decline in inspections over the last ten years and variations in enforcement actions by Bureaus is likely due to a variety of factors, including but not limited to, enforcement priorities, use of general permits, reduction in staffing, and federal jurisdiction.

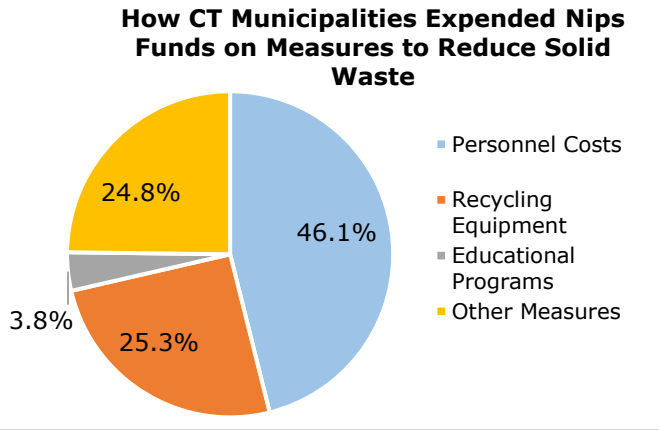
Technical Note: *FFY 2022 was the first year DEEP reported Emergency Response Unit (ERU) data. To ensure consistency with previous years' data, the number of inspections attributed to the ERU were subtracted from the total number of inspections reported in FFY 2022, FFY 2023, and FFY 2024.

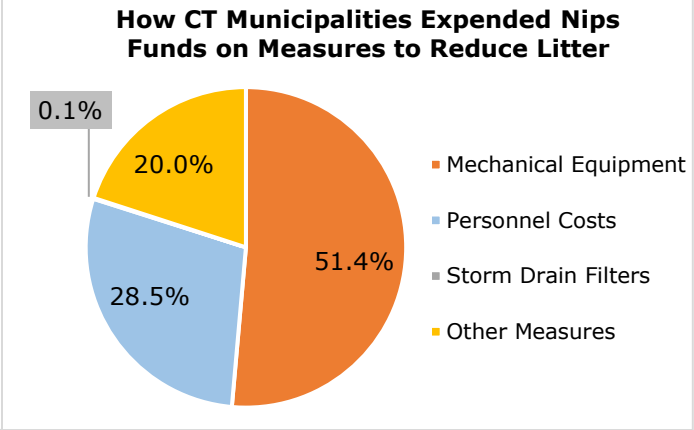
Miniature Beverage Containers



Between October 1, 2021, and March 31, 2024, 162 out of the 169 municipalities in Connecticut received approximately $11.4 million in aggregate, through the surcharge on miniature alcohol beverage containers (Nip bottles), which equates to approximately 227.5 million Nip bottles. For the reporting municipalities (132 out of 162), between July 1, 2023 and June 30, 2024, approximately 32 percent of the funds received from the surcharge on the Nips was expended on measures to reduce the generation of solid waste, and approximately 68 percent was expended on measures to reduce the impact of litter caused by such solid waste.

During the current reporting period, approximately $837,806 was expended on one or more measures to reduce solid waste, including $386,136 on personnel costs, such as the hiring of a recycling coordinator; $31,524 for education efforts; $212,286 for recycling equipment; and $207,860 for "other" measures. In addition, approximately $1,813,068 was expended on one or more measures to reduce the impact of litter, including $1,571 on the installation of storm drain filters; $932,279 for equipment for the mechanical collection of litter, such as street sweepers; $516,157 to support the collection of litter by personnel; and $363,062 for "other" measures.





To view a more detailed explanation of the use of funds and the environmental "other" measures to reduce solid waste and/or the impacts of litter, visit "Preliminary-findings-of-the-review-of-the-miniature-beverage-container-surcharge-program-12-20-2024.pdf".[100]

This page explains how climate change affects the environmental indicators in this report.

Air Quality: Atmospheric warming associated with climate change has the potential to increase ground-level ozone in many regions, which may present greater challenges for compliance with the ozone standards in the future. Air pollutants, such as ozone and particulate matter (PM), can adversely impact ecosystems, and increase the amount and seriousness of lung and heart disease and other health problems.

Bald Eagles and Osprey: Climate change affects the survival of bald eagles on multiple levels, according to scientists. As climate change progresses, the National Audubon Society's climate model projects that bald eagles will have just 26 percent of their current summer range by 2080. It is possible that the birds will adapt and reclaim summer terrain as new areas become hospitable, but it isn't known whether the birds will be able to find the food and habitat they need to survive.

Climate Changers: Greenhouse gases (GHG), including carbon dioxide (CO_2), from human activities are the most significant drivers of observed climate change. Carbon dioxide is generated as a result of the combustion of fossil fuels and to a lesser extent, the clearing of land for agriculture, industry, and other human activities. As described in a recent study released by the Governor's Council on Climate Change, average temperatures in Connecticut could increase by 5°F (2.7°C) by 2050 compared to the 1970-1999 baseline in Connecticut.

Degree Days: Degree days are defined as the number of degrees by which the average daily temperature is higher than 65°F (cooling degree days) or lower than 65°F (heating degree days). Growing degree days (GDD) are a temperature derived index used to correlate with the amount of heat available for the growth of plants, insects, and disease organisms.

Drinking Water: Extreme rainfall events lead to more runoff when the soil simply is not able to absorb the precipitation at the rate it is falling. In urban, suburban, and agricultural areas, this runoff can pick up pollutants from the landscape and carry them to nearby rivers and other waterways, potentially affecting the quality of drinking water. Climate change can affect the ability to maintain source water quality as well as the water quality conditions of surrounding rivers, lakes, and streams.

Electricity at Home and Work: Increases in temperature will likely increase energy demand, as well as change our ability to produce electricity and deliver it reliably. In a warmer climate, more electricity will be used for air conditioning and less natural gas, oil, and wood for heating. To the extent that the increased demand is met by sources that are carbon-based, greenhouse gas emissions will increase, and climate warming will be exacerbated.

Farmland: Climate change may benefit some plants by lengthening growing seasons. However, other effects of a warmer climate, such as less carbon sequestration in the soil, more pests, droughts, flooding, less predictable weather patterns, and changes in ground-level ozone concentrations will not be beneficial for agriculture.

Forest Birds: Climate change affects birds both directly and indirectly. Rising temperatures and changes in weather patterns affect birds' ability to find food and reproduce, which over time impacts local populations. As temperatures warm, some bird species will benefit from milder winters and extended breeding seasons. Others, such as northern birds associated with forest habitats, will likely decline in Connecticut, due in part to increased competition and increased frequency of droughts and extreme storm events that might inflict higher mortality.

Invasives: Climate change threatens to increase the extent, number, and severity of invasive species. The milder winters and extended spring that comes with climate change are helping invasive species extend their ranges, pushing aside native species and transforming habitats.

Lobsters: Climate change is increasing the water temperature of Long Island Sound. Water temperature is believed to have a significant impact on lobsters' health and ecology (e.g., recruitment, behavior and distribution).

Nature-based solutions: Nature based solutions include sustainable planning, design, environmental management and engineering practices that weave natural features or processes into the built environment to promote adaptation and resilience. These solutions use natural features and processes to combat the impacts of climate change, reduce flood risk, improve water quality, restore and protect wetlands, and reduce urban heat.

Piping Plovers: Coastal-nesting birds, such as the piping plover, are among the species most threatened by climate change. Rising sea levels might reduce nesting areas available for piping plovers and many coastal and nesting birds.

Preserved Land and Forests: The climate influences the structure and function of forest ecosystems and plays an essential role in forest health. Forests are sensitive to changes in temperature and precipitation and are greatly affected by fragmentation and land-use change, invasion by nonnative species, forest diseases and insect pests, and extreme weather events. The conservation of land and, particularly forests and wetlands, can help to reduce greenhouse gases in the atmosphere and the impacts of climate change.

Renewable Energy: The use of renewable energy is one of the most effective tools against climate change. Zero carbon energy sources provide clean and sustainable electricity without toxic pollution or global warming emissions. Solar panels, wind turbines, hydroelectric facilities and other technologies do not release any emissions as they generate electricity.

Rivers and Streams: Rivers and streams are affected greatly by fluctuations in precipitation and evaporation patterns around the world. Warming temperatures are altering the water cycle and shifting precipitation patterns. An increase in severe storms due to climate change will degrade water quality and increase the risk of catastrophic floods; while frequent droughts, enhanced evaporation, and decreases in overall annual rainfall would result in reduced water levels in streams, rivers, and lakes.

Swimming, Clamming and Oystering: As the atmosphere warms, changes to the amount, timing, distribution, and intensity of precipitation will continue. As more intense precipitation leads to increased runoff, more pollution is washed into waterways, including sediments, nitrogen from fertilizers, pathogens and pesticides, which adversely affect water quality.

Transportation - Driving and Riding: Combustion of fossil fuels, such as gasoline and diesel, releases GHG emissions into the atmosphere. Both nationally and in Connecticut, the transportation sector is the greatest contributor of GHG emissions.

Warming and Rising Waters: Global mean sea level has risen about 8–9 inches (21–24 centimeters) since 1880, with about a third of that occurring in just the last two and a half decades. The rising water level is mostly due to a combination of meltwater from glaciers and ice sheets and thermal expansion of seawater as it warms. The Connecticut Institute for Resilience and Climate Adaptation (CIRCA) recommends that Connecticut plan for and expect 50 centimeters (20 inches) of sea level rise by 2050 with further increases following that date.

Waste Diversion: Recycling and waste reduction have many direct benefits; however, the indirect benefits are also significant. Recycling and waste diversion reduce GHG emissions that would be

created by the production, transport, and disposal of municipal solid waste. Increasing recycling and source reduction has been identified as key strategies for reducing GHG emissions.

Water of Long Island Sound: Climate change has a variety of direct and indirect effects on ocean ecosystems. Climate change may increase the occurrence of hypoxic conditions because more frequent, intense storms and warming waters can lead to increased stratification of the water column, increased nutrient input, and diminished oxygen capacity. In addition, increased runoff, fertilizers, failing septic and sewer systems, and coastal development also affect the quality of the water in Long Island Sound.

Wetlands: Wetlands play a role in mitigating risks from climate change. Wetlands are an important sink for GHG, where carbon is stored and prevented from entering the atmosphere. Wetlands provide important functions including cleaning up polluted water. slowing and storing floodwaters and snow melt, recharging groundwater, and supporting habitat for many different native plant and animal species.

Remedying the Deficiencies of Existing Programs and Activities

The Council acknowledges the efforts of the Governor and Legislature in enacting legislation in recent years to address the critically important issue of climate change. Consistent with its charge to recommend actions to improve state environmental programs, the Council recommends the following:

- **Expand efforts to more aggressively reduce ozone and greenhouse gas (GHG) emissions:**
  - reduce the consumption of energy in all sectors;
  - expand the use of mass transit and electric-drive vehicles;
  - reduce solid waste and increase the diversion of solid waste;
  - support strategies identified in the State Implementation Plan to reduce ozone; and
  - increase the development and use of renewable energy sources, such as solar and wind.

- **Promote nature-based solutions that:**
  - restore coastal habitats;
  - protect potable water sources;
  - increase carbon sequestration and protect forests and wetlands as carbon sinks;
  - meet open space and farmland preservation goals; and
  - increase climate-smart agriculture and soil conservation.

- **Protect watershed land and water resources to protect drinking water sources, reduce hypoxia conditions in Long Island Sound, increase the area of productive shellfish beds, and eliminate the number of beach action days:**
  - promote protective land use controls and establish and protect riparian buffers;
  - eliminate combined sewer overflows (CSOs) and sanitary sewer overflows (SSOs);
  - reduce the use of pesticides and herbicides; and
  - reduce impervious surface area.

- **Enhance land preservation efforts, protect agricultural land and core forests, and increase and enhance municipal open space and parks:**
  - expand the review of the "material affect" of energy projects on prime farmland soils and core forests, (see provisions of Public Act 17-218, section 3);
  - replace converted municipal open space/parks with comparable open space/parks; and
  - increase tree and forest canopy in urban areas.

- **Increase resources for DEEP and other agencies to:**
  - provide program administration and assistance to municipal wetland officials and commissions;
  - enhance land preservation efforts for open space, forests, and farmland;
  - protect and enhance habitats for all of Connecticut's flora and fauna;
  - review, at least every five years, the designation of species as endangered, threatened or of special concern, and areas identified as essential habitats, consistent with the provisions of Connecticut General Statutes Section 26-307;
  - incorporate consideration of the rising sea level in project planning and funding in shoreline communities; and
  - control the introduction and expansion of invasive species.

Activities of the Council in 2024

Research and Reports

The Council published the *2023 Environmental Quality in Connecticut* annual report in May 2024.

In 2023, Public Act 23-76 established a requirement for the Council to conduct a review of "programs and measures of local governments implemented pursuant to subsection (d) of Section 22a-244b," as part of the Council's review of the programs and activities of the state and local governments and private organizations, as required by Connecticut General Statutes (CGS) Section 22a-12. Subsection (a) of CGS Section 22a-244b established a five-cent surcharge on any beverage container containing a spirit or liquor of fifty milliliters or less, often referred to as Nips.

For the survey conducted in 2024, the Council found that approximately 32 percent of the funds received from the surcharge on the Nips was expended to reduce the generation of solid waste, and approximately 68 percent was expended to reduce the impact of litter caused by such solid waste. See the Miniature Beverage Containers discussion in this 2024 Annual Report for more information as well as the Council's 2024 Preliminary findings of the review of programs and measures of local governments on the expenditure of funds from the surcharge on spirit or liquor beverage containers of fifty milliliters or less (Nips).

The Council also notes that there was no new data for certain indicators, including wetlands, forests, bats, forest birds, and turtles. The inclusion of biological indicators requires considerable care in the selection of appropriate species, and the Council is grateful for the advice it received from experts.

Advice to Other Agencies

Council staff reviewed proposals submitted to the Connecticut Siting Council; Environmental Impact Evaluations, and notices prepared by other agencies, consistent with the requirements of the Connecticut Environmental Policy Act; forest management plans; draft request for proposals / bid preferences; draft general permits, studies and reports; and proposed projects funded through the Federal Local Bridge Program and submitted comments when deemed appropriate. The Council provided training to several state agencies and updated the notice templates to assist state agencies to develop notices for publication in the *Environmental Monitor*.

The Council commented on several state activities and plans, including but not limited to the following:

- DEEP's Draft Release Based Cleanup Regulations;
- DEEP's Integrated Water Planning Management V2;
- DEEP's Proposed Environmental Classification Document;
- Proposed replacement of Kenyonville Road Bridge in Woodstock, Grantville Road Bridge over Mad River and the White Street Bridge over the Still River in Winchester, Day Road Bridge in Pomfret, and Cotton Bridge Road Bridge in Killingly;
- DEEP's Draft General Permits for 1) the Discharge of Swimming Pool Wastewater to Surface and Ground Waters of the State, 2) Point Source Discharges to Waters of the State from the Application of Pesticides, 3) the Discharge of Dewatering and Remediation Wastewaters, One Day Collections of Certain Wastes and Household Hazardous Waste, 4) Discharges to Surface and Ground Water, 5) Act as a Contractor to Contain or Remove or Otherwise Mitigate the Effects of Certain Releases, and 6) In Situ Remediation: Chemical Oxidation;
- DEEP's Draft Forest Management Plans for The Preserve State Forest and Salmon River State Forest: Gilead Block;
- DEEP's Shared Clean Energy Program Year 6;

- DEEP's Regulatory Amendments and Revision to State Implementation Plan;
- DEEP's draft 2024 Connecticut Clean Hydrogen Roadmap;
- DEEP's Notice of Three Minor Air Quality Regulatory Amendments and Revision to State Implementation Plan;
- The Long Island Sound Study's Draft Comprehensive Conservation and Management Plan;
- The Department of Agriculture's requirements for Clean Energy Projects on Agricultural Land;
- The Office of Policy and Management's Draft Conservation and Development Policies Plan 2025-2030;
- 5 applications for a Certificate of Environmental Compatibility and Public Need and 21 Petitions for Declaratory Ruling to the Connecticut Siting Council.

The Council also commented on proposed legislation during the 2024 legislative session that could have impacted Connecticut's environment.

Public Act 20-9, An Act Revising Provisions of the Transfer Act and Authorizing the Development and Implementation of a Release-Based Remediation Program, stipulated that the Council would be a member of a working group to develop regulations to implement a Release-Based Remediation Program. The Council has participated in the working group through the subcommittees and group meetings. The Council submitted comments to DEEP regarding the Draft Release Based Cleanup Regulations.

Citizen Concerns and Complaints

State law directs the Council to investigate citizen complaints alleging violation of any statute or regulation in respect to environmental quality. In 2024, staff investigated numerous inquiries and complaints including, but not limited to noise; inland and tidal wetland impacts; concerns about forest management plans; the application of pesticides; remediation; development and decommissioning of solar facilities; and water quality. The Council also addressed questions regarding the applicability of the Connecticut Environmental Policy Act (CEPA) to certain proposed state actions. Routine matters are usually addressed by referring the person who inquired or complained to the appropriate person or agency to handle the matter. The Council appreciates the assistance provided by the Departments of Energy and Environmental Protection (DEEP), Public Health, and Transportation; the Office of Policy and Management; and others to answer citizen inquiries and resolve complaints.

Every month the Council discusses the inquiries and complaints of environmental consequence that were presented to the Council by individuals and groups. In 2024, the Council held 12 regular meetings. The approved meeting minutes and link to the meeting recording for all recent meetings are available on the Council's website.

Council Duties

The main responsibilities of the Council on Environmental Quality are described in Sections 22a-11 through 22a-13 of the Connecticut General Statutes (CGS).

The Council is a nine-member board that works independently of the Department of Energy and Environmental Protection (except for administrative functions). Five members are appointed by the Governor, two members by the President Pro Tempore of the Senate, and two members by the Speaker of the House. The Council's responsibilities include:

1. Submittal to the Governor of an annual report on the status of Connecticut's environment, including progress toward goals of the statewide environmental plan, with recommendations for remedying deficiencies of state programs. In 2023, Public Act 23-76 was enacted that requires the Council to assess programs and measures of local governments implemented pursuant to CGS subsection (d) of Section 22a-244b.

2. Review of state agencies' construction projects.

3. Investigation of citizens' complaints and allegations of violations of environmental laws.

4. Review of environmental impact evaluations that state agencies prepare for major projects under the Connecticut Environmental Policy Act (CEPA).

5. Publication of the *Environmental Monitor*, the site where all state agencies must post their notices required under CEPA including, but not limited to, scoping notices and notice of the availability of environmental impact evaluations. The *Environmental Monitor* also is the official publication for notice of intent by state agencies to sell or transfer state lands. In 2024, the Council reviewed and published 85 notices in the Environmental Monitor.

6. Participation in studies and working groups on environmental issues, as directed by the legislature, such as the Release-Based Clean Up Program Regulation Development.

Council Members

Keith Ainsworth
Keith Ainsworth has been an environmental and land use litigator of the New Haven Bar for nearly three decades. Keith has a broad conservation-based practice representing land trusts, non-profits, landowners and businesses in transactions and litigation throughout Connecticut before administrative agencies and state and federal courts. As a former chair of the Connecticut Bar Association Environmental Law section and a municipal first selectman (Haddam), Keith has a perspective from several sides of the table. A graduate of Tufts with a bachelor's degree in biology, environmental studies and English literature, Keith brings a scientific and analytical background to the law. Keith is a life member of the Madison Land Conservation Trust and served on the national leadership council of Trout Unlimited. Keith also serves as General Counsel to Vista Live Innovations, Inc., a private educational institute for adults with intellectual disabilities. Keith is also an avid outdoorsman and author of several volumes of poetry.

Timothy Bishop
Timothy is currently managing natural resources by serving the Town of Fairfield as the Director of the Conservation Department and managing inland wetlands, tidal marsh restoration, open space, land acquisition and shellfish programs. With over 21 years of experience as a consultant on environmental investigation and remediation projects throughout New York, New Jersey, and Connecticut. Mr. Bishop has performed and managed a variety of due-diligence related projects, including; over 2,000 environmental site assessments, soil, groundwater and air quality investigations, remedial system design and monitoring and remediation, including soil excavation and in-situ techniques, water supply, hazardous waste disposal, building material surveys and over 4,000 storage tank removals. Other professional tasks include office duties such as contractor, client and budget management, business development, invoicing, data analysis, technical reporting and Agency/Regulator collaboration. He also has extensive experience and leadership in natural resources in both private, municipal and State government sectors, including certifications as a Professional Wetlands Scientist, Certified Ecologist and Certified Environmental Professional.

Linda Bowers
Currently a resident of Wethersfield, but lived for many years in Middletown. After graduating from Springfield College with a BS in Environmental Studies and working towards a Masters in Urban and Regional Planning at Virginia Tech, Linda spent over 30 years in the environmental field in CT. Her work included projects in civil engineering (environmental impact analysis statements and groundwater quality), as Town sanitarian in Guilford, followed by open space planning, purchase, and advocacy for the City of Middletown and The Nature Conservancy CT Chapter. After a crisis of despair over society's inability to care about environmental degradation, she turned to giving joy to people by opening a used book store. It turns out that caring about the environment cannot be easily abandoned and retirement now includes volunteering for environmental causes and hoping to influence grandchildren.

Christopher Donnelly
Resident of Durham. Retired from the Department of Energy and Environmental Protection (DEEP) in 2020, where he worked in the Division of Forestry as the Urban Forestry Coordinator for twenty years. Prior work experience includes working as arborist and as the field representative of a major lumber trade association. Graduated with a master's degree in Forest Science from the Yale School of Forestry and Environmental Studies, now known as The School of the Environment, and is licensed as an arborist in Connecticut and certified as a forester. In retirement, he remains active with the Connecticut Tree Protective Association, where he administers the course for those seeking their arborist license, and with the Connecticut Urban Forest Council, currently serving as Vice-Chair.

David Kalafa
Resident of Middletown. Over thirty years working for the State of Connecticut developing and implementing policy for energy and conservation at the Office of Policy and Management and Department of Energy and Environmental Protection. Retired as Undersecretary for Comprehensive Planning and Intergovernmental Policy at the Office of Policy Management. Served on the State Water Planning Council and Governor's Climate Change Commission. Holds a Master of Public Administration from the State University of New York and a bachelor's degree in Economics from Skidmore College.

Aimee Petras
Resident of West Hartford. Aimee currently serves as the Executive Director of the Farmington River Watershed Association (FRWA), a non-profit focused on preserving, protecting, and restoring the Farmington River through research, education, and advocacy. She has worked at FRWA for over 18 years managing projects related to watershed planning, water quality protection, habitat restoration, and green infrastructure. She is an alternate for the Water Resources Protection position on the Connecticut State Water Planning Council Advisory Group and is a member of the Sustainable West Hartford Commission's Nature-Based Solutions Working Group. Prior to joining the FRWA, she was an Agricultural Peace Corps Volunteer serving in Morocco. Aimee also worked as a Hydrogeologist for Leggette, Brashers and Graham, an environmental consulting firm specializing in groundwater. She holds a Bachelor of Science in Geology from Stony Brook University, NY.

S. Derek Phelps
Resident of Killingworth. Derek currently serves as Head of Policy & Governmental Affairs for Twelve, a clean tech startup focused on transforming waste CO2 into useful products for manufacturing and transportation. He is a highly experienced political and governmental affairs professional with an extensive climate change mitigation, energy, and legislative focus. Derek has worked in both the public and private sector, advocating for matters involving renewable and sustainable resources, public utilities, and project siting before congress and state and local governments. Derek earned a Bachelor's degree in public administration from the University of Connecticut. He also earned a Master of Science degree in e-Media Communications from Quinnipiac University.

Denise Rodosevich
Resident of Hebron. Denise was an attorney with the State of Connecticut for over twenty years providing legal advice, analysis, and representation to several state agencies, including what was formerly known as the Department of Environmental Protection (DEP). Environmental law, policy, and advocacy were important aspects of her state service. Prior to that, she was a litigator in private practice and worked in various environmental analyst job titles at DEP. Denise was also an Adjunct Professor of Law at the University of Connecticut School of Law, teaching, among other courses, Toxic Torts. She has authored one and co-authored another article addressing aspects of the Comprehensive Environmental Response, Compensation, and Liability Act. In addition to her law degree from the University of Connecticut School of Law, she holds a bachelor's degree in Environmental Conservation and a master's degree in Environmental Studies from the University of Colorado and the University of Montana, respectively.

William Warzecha
Resident of Norwich. Retired from the Department of Energy and Environmental Protection with 36+ years of service. Early in his career, he served as the geologist/hydrogeologist to the Eastern Connecticut and King's Mark Environmental Review Teams applying his technical background and expertise mainly in the areas of water supply development, waste disposal, and geologic development concerns with respect to major land-use projects, watershed studies and natural resource inventories statewide and assisted staff of the Connecticut Geological & Natural History Survey on geologic studies and investigations. Retired as the supervising environmental analyst for the Department's Remediation Division primarily responsible for enforcing the state's ground water

pollution and potable water laws, protecting the state's water resources, and overseeing the clean-up of soil and ground water at polluted industrial and commercial sites. He was a long-time Board member representing the City of Norwich to the Uncas Health District and is presently serving as a Trustee at the Norwich Free Academy and a member of the Board of Commissioners for the City of Norwich's Public Utilities and Sewer Authority. Holds a master's degree in Environmental Management and Policy and a bachelor's degree in Environmental Earth Science.

Council Members whose terms expired in 2024

Matthew Reiser
Resident of Avon. Environmental, health and safety consultant with over 20 years of experience performing regulatory compliance auditing, planning, training and reporting; air, water and waste discharge permitting; and air, water and waste sampling for industrial, commercial, municipal and institutional facilities. Member, Connecticut Chapter of the Academy of Certified Hazardous Materials Managers and Connecticut Marine Trades Association Environment Committee.

Charles Vidich
Resident of Ashford. Environmental and land use consultant concerned with energy efficient and sustainable patterns of development. Served as manager of the United States Postal Service Corporate Sustainability Initiatives program with responsibility for sustainability, energy efficiency and environmental management systems for the nation's 32,000 domestic and overseas Post Offices. Previously served as the principal planner for the Central Naugatuck Valley Council of Governments where he developed solar conscious land use ordinances and the nation's first comprehensive regional plan of development. Appointed to the Connecticut Land Use Education Council with the mission to improve the skills and resources available to local planning and zoning commissions. Received the Lifetime Achievement Award from the Environmental Protection Agency's National Sustainable Materials Management program. Appointed as a visiting scientist to the Harvard School of Public Health as well as the Harvard Humanitarian Initiative where he lectured on scientific approaches on the use of quarantine and the environmental control of communicable disease. He served as the pivotal expert witness in a celebrated Connecticut Supreme Court case that successfully overturned restrictive zoning regulations and in a federal district court case that successfully overturned discriminatory land use practices.

Acknowledgments

The Council acknowledges the contributions of environmentalists that have worked tirelessly to improve the quality of life for all species on Earth. The Council recognizes all the former members of the Council and staff, including Matt Reiser and Charles Vidich, whose terms expired in 2024, after eight years of service.

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Image Credits: The "warming earth" symbol used to denote indicators affected by climate change was created by the Council. The image of the Asian tiger mosquito is attributed to Susan Ellis. The image of the map of Connecticut with the status of Ospreys' nests was obtained from Connecticut Audubon, Osprey Nation Map. The image of hydrilla was obtained from the United States Army Corps of Engineers. The image of tree canopy in environmental justice communities was provided by Danica Doroski and Isabelle Zaffetti. The image on the cover of Chatfield Hollow State Park was provided by Paul Aresta. The Council greatly appreciates their generosity in allowing the use of these excellent images in this report.

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