Environmental Quality in Connecticut 2012

March 28, 2013

The Honorable Dannel P. Malloy
Governor of Connecticut
State Capitol
Hartford, CT 06106

Dear Governor Malloy:

This is the Council's report to you on the condition of Connecticut's environment for 2012.

The core of the report is a consistent set of environmental indicators by which we measure Connecticut's progress. Once again, the annual statistics reveal little change, with a few minor downturns and even fewer improvements. Reasons behind the apparent resistance to improvement are discussed in the introduction.

Connecticut residents -- especially those living on the coast -- gained insights in 2012 into what warming temperatures will mean for this state: rising waters, more water pollution and more days of bad air.

The introduction also lists the key steps to a better environmental future: greater energy efficiency, better development patterns, and investment in basic conservation and restoration services. Later in the year, the Council will submit specific recommendations for improving Connecticut's environment based on the data in front of you.

This edition includes many changes in data presentation that we think will be regarded as improvements.

As always, the Council looks forward to providing you with any additional information or assistance that you might request.

Respectfully submitted,

The Council on Environmental Quality

Environmental Quality in Connecticut 2012

March 2013

Welcome to *Environmental Quality in Connecticut*. This edition explores the condition of Connecticut's environment through 2012.

The Council made several changes to the format this year. Also new this year: the Council will update some of the indicators in the weeks ahead as more data for 2012 become available. Sign up for e-alerts to receive a notice when updates are published.

Later in the year, the Council on Environmental Quality will publish recommendations for improving Connecticut's environment based on the data in this report.

The Council welcomes any questions, suggestions or comments you might have.

Snow geese over New Haven October 2012 >>

Photograph courtesy of Nick Bonomo (read more)

Improvements and Declines: 2012 At a Glance

The symbols* below show year-over-year changes in environmental conditions. Click a symbol to read the details and see the long-term trend for that indicator.

Environmental Quality Indicators

Good Air Days

CEQ Annual Air Pollution Index

Preserved Land

Forest

Farmland

Inland Wetlands

Beach Closings

Piping Plovers


Sound Life

Sound Pollution

River Swimming

Bald Eagles

Public Drinking Water

Breast Cancer

Non-Hodgkin's Lymphoma

Personal Impact Indicators

Miles Driven

Buses Taken

Compliance

Recycling Rate

Climate Changers

Electricity Efficiency at Home and Work

*Symbols Explained

The symbols above and on the pages that follow include arrowheads that illustrate improvement (arrowhead up) or decline (arrowhead down) in environmental conditions. There are four variations of these symbols plus gauges, hourglasses and exclamation marks:

The data show a positive change from the previous year. The one-year change is not always consistent with the long-term trend, which is displayed on the chart.

The data show a negative change from the previous year. The one-year change is not always consistent with the long-term trend, which is displayed on the chart.

No arrow means the data for the latest year available show a very small change, positive or negative, from the previous year. If the color is green, the indicator is unchanged at a satisfactory level; if red, unsatisfactory. If the color is orange, the lack of change is neither good nor bad.

Connecticut is not on track to meet its long-term goal. This symbol is used for those indicators that, except in the most unusual circumstances, always will show some progress. ("Preserved Land" is one example.) It would be misleading to label the one-year change as "improved" if the progress is not sufficient to get the state to its goal by the established target date.

NEW! A gauge shows the current rate (of recycling, for example), used for indicators that can be expressed as rates.

An hourglass means that complete data for 2012 are not yet available. Sign up for e-alerts to receive an automatic notice when updates are published.

NEW! Change is underway with uncertain implications, and Connecticut needs to pay attention.

Introduction

Connecticut's environment is resistant to improvement. Last year's edition of this report stated that

> "Connecticut's environmental statistics for 2011 look typical of recent years: they portray a static state with slow or no progress on some of the biggest challenges, peppered with small improvements and minor retreats."

The same assessment applies to 2012 but with fewer improvements.

In light of Connecticut's persistent efforts to control pollution and manage its resources, some of the declines of 2012 are particularly frustrating:

- more bad air days,
- more widespread hypoxia (insufficient oxygen) in Long Island Sound, and
- land conservation results that failed to put Connecticut back on track toward its goals.

The improvements of 2012 were few in number and modest in scale:

- Shoreline beaches were closed for fewer days in 2012 than in 2011, but 2011 was the worst year on record; the number of closings in 2012 was well above the long-term average.
- Drinking water improved, with 99.8 percent of all water piped to customers (2.8 million people) meeting health standards. That percentage was 99.7 in the previous year. The potential to improve is limited because Connecticut has excelled in protecting drinking water for many years.
- Two "personal impact" indicators -- miles driven and bus trips taken -- showed improvement but have yet to yield discernable air quality benefits.

Stagnation is discouraging but should not lead anyone to conclude that pollution controls and resource management have failed. Given the population density of this state, our air and waters would rival the planet's worst if it were not for decades of successful environmental management. But the recent run of little change might cause the Connecticut resident to ask if current conditions are likely to stay the same for the remainder of his or her life.

They probably will not.

The data of 2012 contain portents of a warmer Connecticut where air quality declines, sea level rises and storms wash more pollution into rivers, streams and Long Island Sound. Coastal residents experienced all of these warm-weather effects in 2012 more acutely than the average resident.

Can Things Get Better?

Of course. But improvement will not result from some of the familiar environmental programs such as enforcement. Enforcement and compliance still are critically important for averting releases of chemicals, petroleum and numerous pollutants, but rarely will they improve Connecticut's air and water. The key ingredients of a cleaner Connecticut are relatively simple and few in number:

- more efficient and technologically-advanced heating and cooling equipment and vehicles,
- investment in the basics of sewage treatment, land conservation, parks and other essential services,
- better patterns of land development and transportation, including a strategy for dealing with the rising Sound, and
- restoration of rivers, wetlands, parks, trails and greenways by state and local governments as well as nonprofit organizations and heroic individuals.

The Council submits its specific recommendations each year as a separate document.

To understand more completely why improvement is elusive, please review the 30 environmental indicators in this report.

New in This Edition

Changes in Format

Previous editions of this annual report contained non-interactive charts and other features that were vestiges of the time when the report was printed on paper. Regular readers will notice some changes appropriate to a web-based publication:

- **Three Versions -- Gold, Silver and Iron**: You are reading the "iron" version, which is a static compilation of all pages. It is suitable for downloading and printing. If you have the opportunity to read the report online, you can choose between the "gold" and ""silver" versions, both of which provide for easy navigation. All versions have the same content, but the gold version allows you to view the data as you move your cursor over any chart. (These data always have been available upon request, but now they are available instantly.) Because the charts in the gold version might not be compatible with all devices and browsers, there is a "silver" version with non-interactive charts.)

- **Summary Page:** "2012 At a Glance" illustrates year-over-year performance for all of the environmental indicators. Click on any symbol to go directly to the complete page for the relevant indicator, which will include explanations of long-term trends and short-term improvements and declines.

- **Updates:** The Council published this report in March before some data for 2012 were available. The report will be updated as data are added. Sign up for e-alerts (specifically for "publications") to be notified when changes are made.

Changes in Content

There are additions and changes to many of the environmental indicators in this edition. Some notable examples:

- The Forest page includes data on bird population trends as indicators of forest health.

- The indicators for Long Island Sound have been changed almost completely, in part to display the effects of a warming climate.

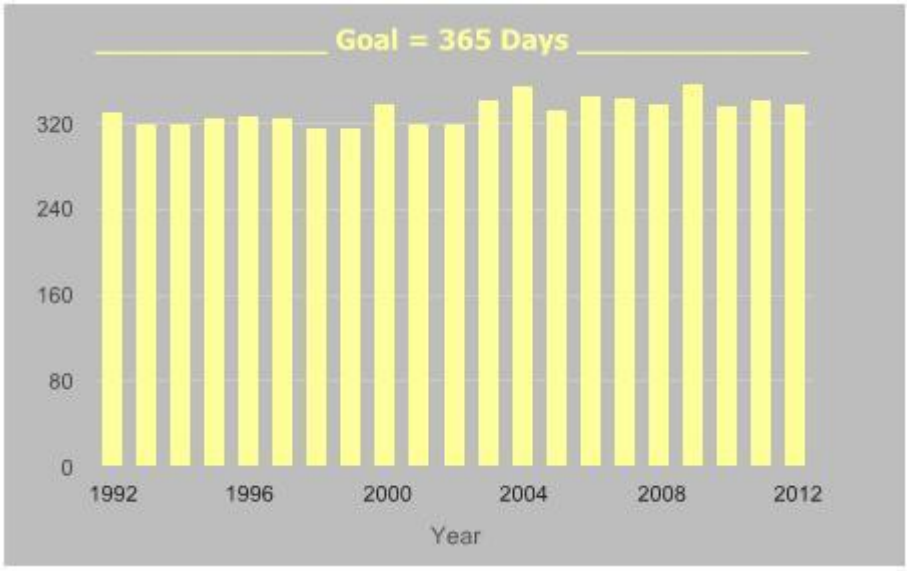
- The inland wetlands indicators have been changed to adjust for the effects of a rollercoaster economy.

Future Additions

The Council intends to add new indicators for asthma and tidal wetlands. Suggestions are welcome.

Good Air Days

The hot afternoons of 2012 yielded unhealthful air across Connecticut.



The chart shows that there were 338 days in 2012 when every Connecticut resident breathed good air, four fewer than in 2011.

A Good Air Day is a day when every monitoring station in the state records satisfactory air quality. "Satisfactory air quality" is defined here as air that meets the specific health-based ambient air quality standards for all of the following 6 pollutants: sulfur dioxide, lead, carbon monoxide, particles, nitrogen dioxide and ground-level ozone.

Connecticut's goal is to have air that meets health-based standards for all pollutants. Violations of health-based air quality standards have been eliminated for all pollutants except ground-level ozone and fine particles.

Ozone is created when nitrogen oxides and organic compounds in the air react in the presence of sunlight. Weather is a big factor in year-to-year fluctuations. Motor vehicles remain a major source of ozone-forming emissions despite improvements in tailpipe standards. Much of Connecticut's ground-level ozone originates in states to the west.

In typical years, cities and towns in coastal regions of the state see the most bad ozone days. In 2007 and 2009, however, inland towns had more. The normal pattern returned in 2010 through 2012 with coastal towns suffering the most bad ozone days. In 2012, the Stratford area saw the most days (16) when ground-level ozone concentrations violated the standard, and the Cornwall region the fewest (3).

Fine particles, such as those found in smoke and haze, are 2.5 micrometers in diameter and smaller. These particles can form when gases emitted from power plants, factories and automobiles react in the air. Violations of the health standard occur mostly in summer and winter, rarely in spring and fall. Most of Connecticut meets the health standard for fine particles, as the details of that standard allow the air to exceed the numerical limit for a few days each year and yet remain in compliance with that standard. In 2012, Connecticut did not see *any* violations of the fine-particle standard (but has already seen some in early 2013).

Technical Note: The federal government modified the standards for fine particles in December 2006 and for ground-level ozone in early 2008. The chart above was redrawn each time to illustrate the state's historical pattern of good air days by applying the new, stricter standards to all previous years. The federal government is again reviewing the standards for particles and ground-level ozone.

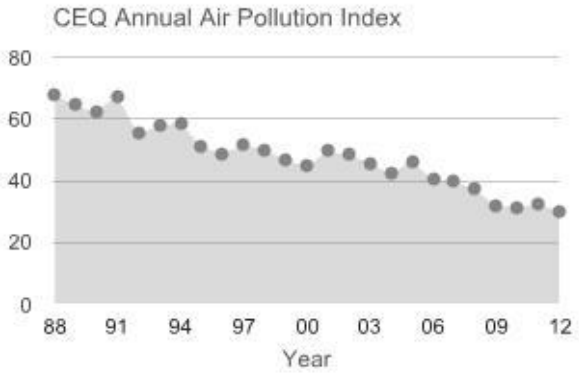
2012, The Short Version:

Hot summer days = bad air for Connecticut, especially on the coast.

CEQ Annual Air Pollution Index

Average Levels of Air Pollution

Air quality was better on most days despite the greater number of days with bad air.



The chart shows the average level of pollution in Connecticut's air for each year. In 2012, there was less pollution in Connecticut's air, on average, than in previous years, despite the fact that the state saw more days of unhealthful air. This pollution paradox is discussed below. Levels of all pollutants except ground-level ozone improved.

Pollution Paradox

In five of the last six years (2007 through 2012), the *average* air quality across Connecticut improved from the prior year. However, in four of those five years Connecticut residents breathed unhealthful air on more days than in the previous year. This pollution paradox can be explained by the role of hot and sunny weather (and sometimes colder episodes). Numerous pollution control measures -- from improvements in automobile emissions to the cleaner fuels being burned by utilities and factories -- have largely been successful and they continue to pay dividends for Connecticut residents on most days of the year. But on certain days, especially the hot sunny ones, Connecticut sees episodes of excessive pollution that violate the standards established to protect human health. (The successful control measures also pay dividends on the bad air days; without those controls, the pollution levels would be even worse than they are.)

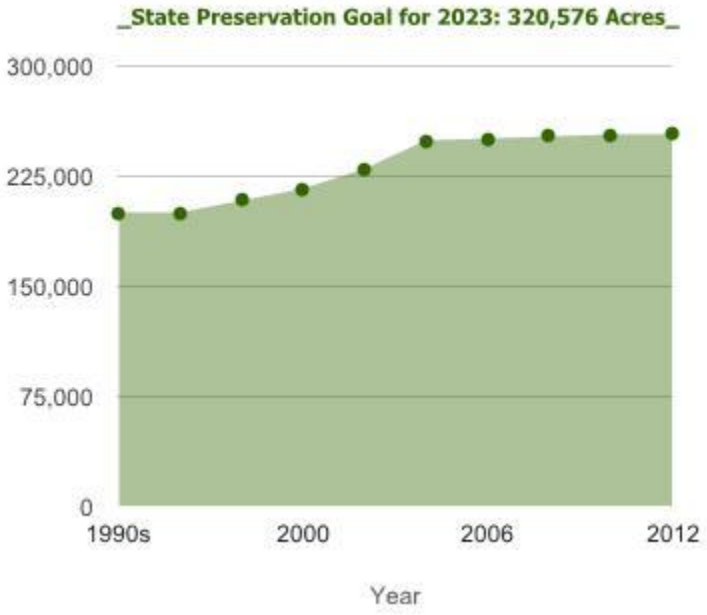
Major Change to this Indicator: Lead is Out

Until 2012, this indicator charted the combined average level of six pollutants, not five as it now does. The sixth pollutant was lead. In the early 1980s, lead was a serious problem, but unleaded gasoline and other advances have reduced lead levels dramatically. Levels of lead have dropped so low that in recent years they barely registered in this indicator. By removing lead from this indicator, the Council is declaring victory on behalf of Connecticut residents. (Lead still is monitored by DEEP, so it can be brought back into this indicator if levels rise unexpectedly in future years.) *NOTE: This page is abridged from the online version.*

Preserved Land

Connecticut has two goals for 2023:

- Preserve 21 percent of the state's land area. (Nobody knows how much land actually has been preserved toward this goal by municipalities and nonprofit organizations.)
- As part of that 21 percent goal, increase the state's own stock of state parks, forests and other lands until they constitute 10 percent of the state's land area; progress toward this goal is not on track, with 341 acres preserved in 2012. (State land acreage is shown on the chart below).



State law (C.G.S. 23-8(b)) sets a goal of conserving 21 percent of Connecticut's land area. The Green Plan, Connecticut's official land conservation plan, establishes 2023 as the target date. That goal includes conservation land owned by towns and cities, land trusts and other nonprofit organizations, water utilities and the state.

The same law sets a goal (10 percent of Connecticut's land area) for state ownership of land for parks, forests and wildlife areas. Records of state-owned lands are accurate and are charted above.

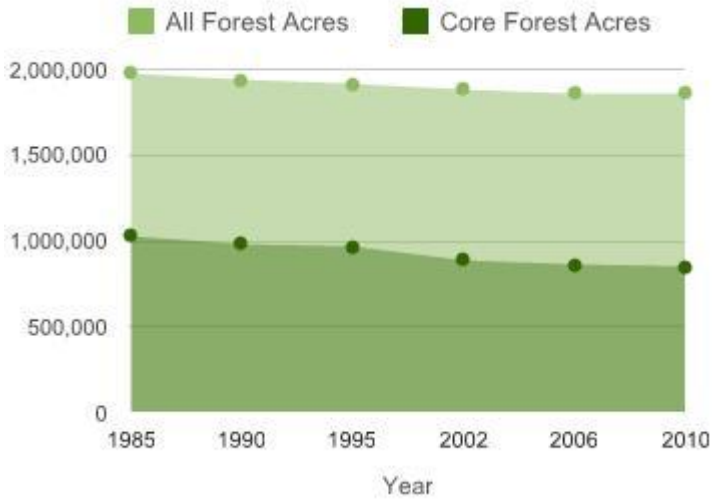
In 2012, DEEP preserved 341 acres. State grants helped municipalities and land trusts acquire an additional 740 acres. This pace is not nearly sufficient to reach the state's goals.

Many additional acres, probably thousands in some years, are preserved by municipalities and land trusts without state grants, but this information is not reported to the state. The Council determined that previous state estimates of the acreage owned by municipalities and nonprofit land trusts were inaccurate. Therefore those estimates, which were reported in some previous editions of *Environmental Quality in Connecticut*, are no longer included in this report.

The absence of an accurate inventory of protected land in Connecticut is a serious deficiency. DEEP has been collecting data from municipal records in a sequential fashion for 12 years; if that effort is ever completed, the earliest-collected data will be well out of date. To make land preservation more strategic and cost-effective, Connecticut needs a reliable and up-to-date registry of the protected lands. An Act Concerning the State's Open Space Plan, adopted in 2012, should eventually lead to an accurate inventory of preserved lands.

Forest

After a century of growth and relative stability, Connecticut's forests -- especially the most valuable core forests -- have been shrinking for three decades.



This indicator shows the total acreage of forests in Connecticut. The forests are divided into core forests and other forests. Core forests are defined as being at least 300 feet from non-forest development such as roads, buildings and farms. Core forests provide habitat for many species of native forest wildlife that cannot tolerate significant disturbance. In contrast, forests that are fragmented or divided by roads and buildings serve some forest purposes but are not fully-functioning forest ecosystems. Fragmented forests are known to provide substandard habitat for some species of wildlife and, in many cases, less opportunity for hunting and other types of recreation. Invasive species of plants and animals frequently appear in the wake of activities that fragment the forests.

Even as the total acreage of forests might fluctuate over years or decades, the extent of core forests will always show a decline, except in rare instances where roads or developments might be abandoned and reclaimed by forests.

Recent Trend

Not much forestland was lost between 2006 and 2010 (the most recent data available), presumably because of the downturn in real estate development. However, core forest acreage continued to shrink, indicating that, as noted above, even minimal development can disrupt a core forest and cause it to lose its "core" status.

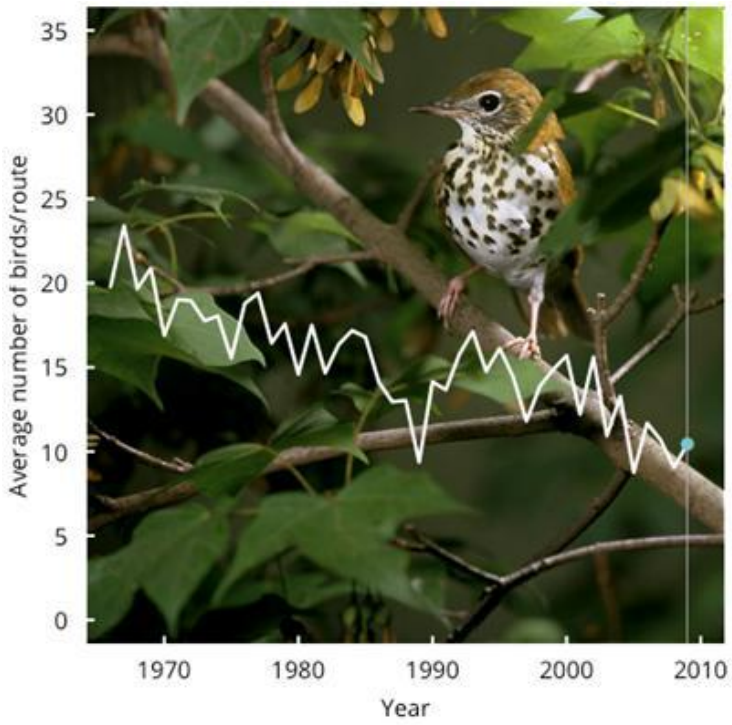
The Long View

Most of Connecticut's forests were cleared for agriculture and to fuel industry in the 19th century; the decline of farming and wood-fuel consumption allowed the forests to regenerate.

From 1960 to 1980, the overall acreage of forest did not change much even with the rapid spread of roads, housing and commercial development. According to the U.S. Forest Service, the spread of forests on abandoned farms equaled the conversion of forested land to other uses. The late 20th century brought a change; as the chart above shows, forest acreage is now declining.

NEW! Birds as Indicators of Forest Health

The wood thrush is heard more often than seen, but is not heard as often as it once was. Researchers at the University of Connecticut analyzed and published trend data for many of Connecticut's breeding birds, including the wood thrush, shown here:



(Field, C.R., Elphick, C.S. 2012. CTBirdTrends)

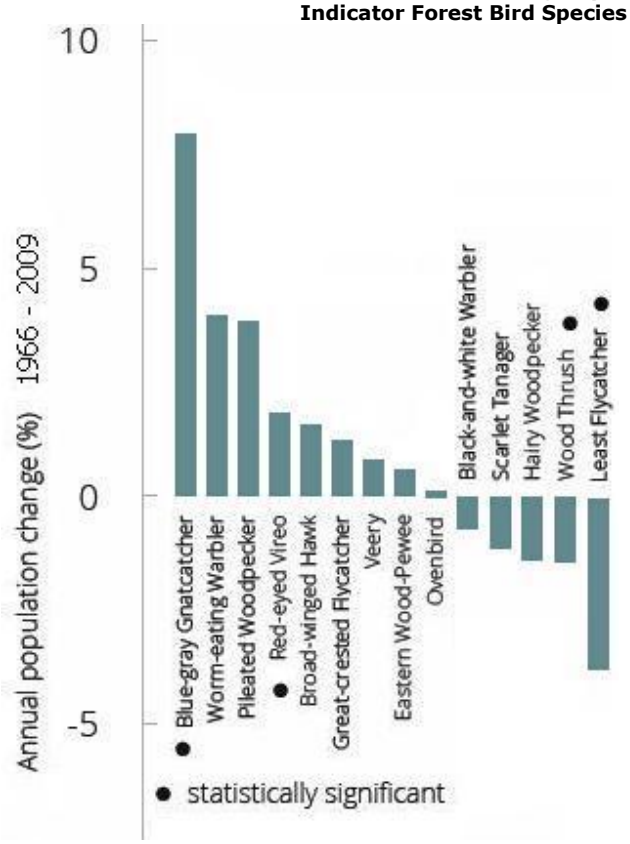
Separately, a committee of experts (see technical notes, below) identified a group of bird species that, along with the wood thrush, can indicate the ecological health of Connecticut's forests. The breeding bird data for those species yield two striking conclusions.

First, several woodland bird species have declined significantly since 1966, but several others have increased or held steady, suggesting that the health of mature deciduous forests might be stable (see first chart on next page).

Second, the species judged to be good indicators of young forests and "shrublands" are down across the board, some of them by a lot (see second chart on next page).

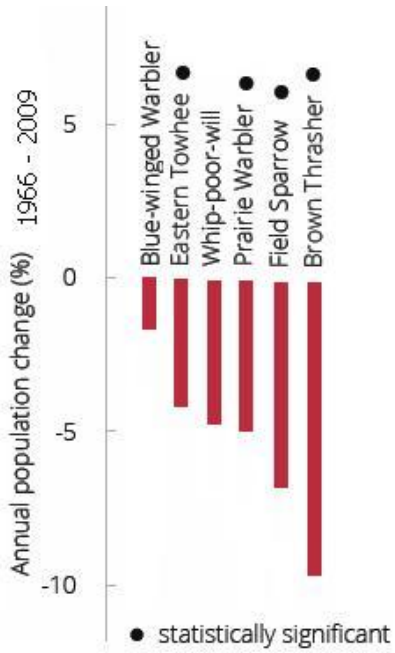
Future Council reports will highlight changes in these bird populations and what those changes tell us about Connecticut's forests.

Trends in Connecticut Breeding Populations of Indicator Forest Bird Species



The species with the extraordinary increase -- the blue-gray gnatcatcher -- is a southern species that has been expanding its range northward. The other species are historically native to this area.

Trends in Connecticut Breeding Populations of Indicator Young Forest/Shrubland Bird Species



Technical Notes for Forest Indicator

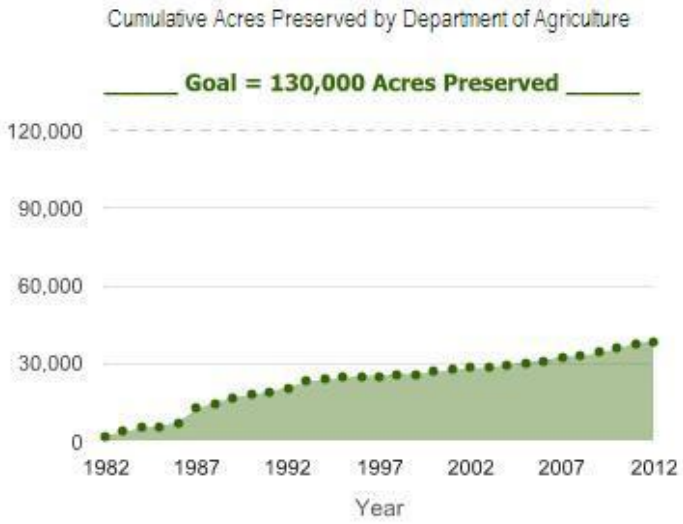
The definition and measurement of core forests is done by the Center for Land Use Education and Research (CLEAR) at the University of Connecticut as part of the Connecticut's Changing Landscape Project. The Council finds these data, derived from CLEAR's analysis of satellite imagery, to be the most accurate data available. Satellite data is examined by CLEAR every few years; this indicator includes the most recent data available (2010).

The bird trend data are published at CTBirdTrends.

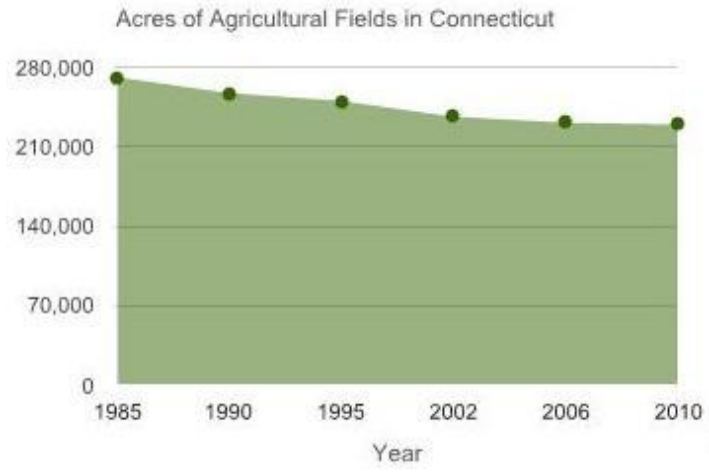
The lists of indicator bird species were developed by the Forest Ecosystem Health Committee of the Connecticut Forestlands Council and published as Appendix 4 of Connecticut's Forest Resource Assessment and Strategy 2010-2015. That committee developed a list of indicator bird species for each of the different types of forests, and the Council selected the lists for deciduous forests -- by far the most common type of forest in Connecticut -- and young forests/shrublands.

Farmland

Connecticut preserved 689 acres of agricultural land -- down from the 1,975 acres preserved in 2011, which was the best year for preservation in two decades.



Farmland loss slowed considerably between 2006 and 2010:



The top chart shows the cumulative acreage preserved by the Connecticut Department of Agriculture since 1982. The bottom chart shows the total area of land farmed in Connecticut.

To preserve land for future agricultural use, the Connecticut Department of Agriculture purchases the development rights to farmland from volunteer sellers. This keeps the land in private ownership with restrictions on future nonagricultural development. More than 1,300 acres were preserved each year from 2008 through 2011. In 2012, six farms participated, preserving 689 acres. The Department of Agriculture attributes the drop, in part, to the start-up of two new programs: the Farmland Restoration Program, which has applications from 50 farms, and the Community Farms Preservation Program, with 11 applications. Most preservation funds are from state bonding and the Community Investment Act, with some federal funding as well.

Connecticut's farmland preservation goal -- 130,000 acres -- is based on the amount of land needed for food production. Projections of the current preservation rate show the goal being reached in the 22nd century, but in reality there will not be that acreage of agricultural land remaining in the state by the end of the current century if the recent rate of loss continues. Preservation of at least 2,000 acres annually should result in success; the meter at the top of the page is based on that 2,000-acre annual minimum rate required for success. The Department of Agriculture plans to reassess the current goal during 2013.

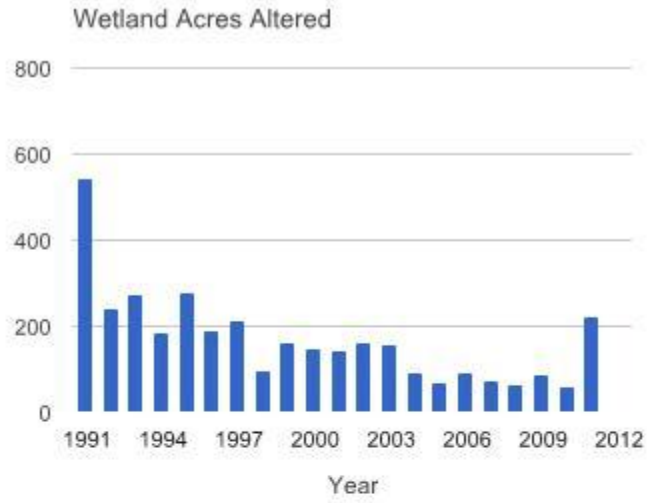
Less farmland was lost between 2006 and 2010 (the most recent data available) than in previous years, presumably because of the downturn in real estate development associated with the recessionary economy.

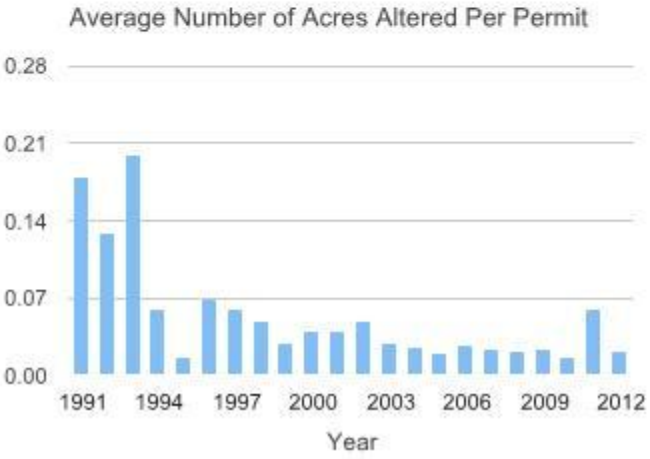
This indicator does not show agricultural land acquired for preservation by municipalities and nonprofit organizations. Several towns purchased farms in recent years with no state assistance, and those acres are not reported or recorded at the state level. Along with a central registry of preserved open space, Connecticut needs a registry of preserved farmland to help state agencies and other organizations preserve land strategically.

Technical Note: Until 2008, the lower chart above showed the total acreage of land in Connecticut farms as counted by the U.S. Department of Agriculture (USDA) using survey data. The Council has found a superior data source in the University of Connecticut's Center for Land Use Education and Research (CLEAR). CLEAR staff analyzes satellite imagery to measure the actual area of fields, pastures, orchards and vineyards. In contrast, the USDA data counted all land in farms, even that which was not used for agriculture. CLEAR analyzes new satellite imagery every few years; the most recent imagery is from 2010.

Inland Wetlands

Between 60 and 90 acres of inland wetlands were altered by development each year from 2004 until 2011, when the rate spiked to more than 200 acres.*





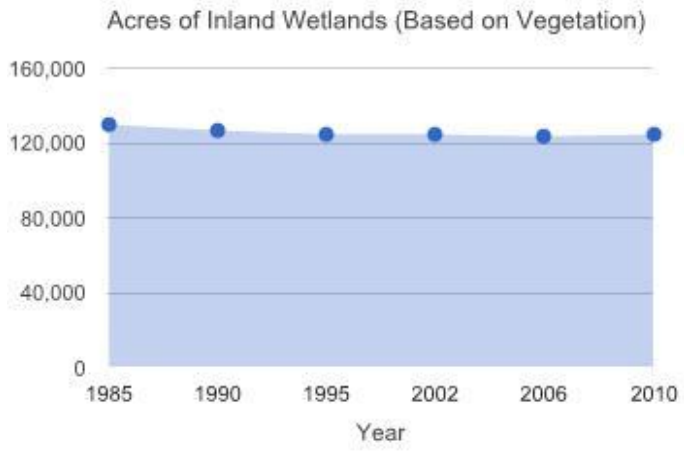
The **top chart** shows how much wetland alteration has been permitted each year by DEEP and municipal wetlands agencies. Alteration can range from total destruction (when the wetlands are filled and built upon) to conversion from one type of wetland to another (when, for example, a shallow swamp is dredged to create a pond). There is no specific goal for statewide wetlands conservation and regulation.

The **second chart** shows the area of inland wetlands affected by the *average* permit issued by municipalities and DEEP. In general, municipal agencies – which issue about 95 of all inland wetlands permits in the state with little or no oversight by DEEP – have become more conserving of wetlands in recent years. According to the data, 2011 was a notable exception (see technical notes, below). Data for 2012 are incomplete at this time.

According to the statistical analysis reported in the 2008 CEQ special report *Swamped*, the completion of wetlands training programs is the single biggest factor that explains why some municipal agencies are more protective of wetlands than others. The long-term trend toward less wetland impact probably can be attributed to completion of training by more municipal agency members and staff.

How much wetland?

It long has been estimated that inland wetlands and watercourses cover about 500,000 acres, or 16 percent, of Connecticut's surface. Most of that acreage is open water. This year, the Council reviewed data from the Center for Land Use Education and Research (CLEAR) at the University of Connecticut as part of the Connecticut's Changing Landscape Project. CLEAR's data are based on analysis of satellite imagery of vegetation. The vegetation-based estimate does not include open water, nor can it be expected to align with Connecticut's unique legal definition of inland wetlands, which is based on soil types. Nonetheless, CLEAR's vegetation-based data presented in the chart below are useful, and they show the rate of wetlands destruction to be slowing.



*Technical Notes

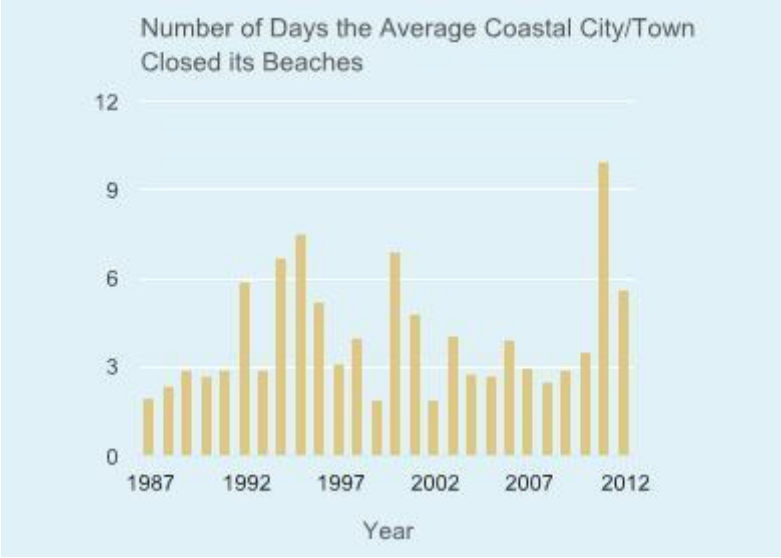
1. The data for the top two charts have weaknesses. Municipal wetlands agencies use paper forms to submit their reports of permit decisions to DEEP, where the data from those thousands of forms are transcribed into an electronic database. The public does not have access to the database, nor does the Council. Errors are common until DEEP audits the reported data, generally years after they are submitted. In the interim, the Council works with DEEP staff to eliminate the most obvious errors in each year's data. Data from before 1994 cannot be checked in a systematic way. The Council is not confident of the accuracy of the 2011 data.

2. The Council adjusts the aggregate data in the top chart to account for the cities and towns that do not submit reports to DEEP. A simple extrapolation is sufficient, because the Council determined in 2008 that nonreporting towns did not differ significantly from reporting towns in their wetlands permitting activity.

3. The per-permit indicator of the second chart was added several years ago to show results of wetlands regulatory activity in a way that would not fluctuate with the economy (as the top chart might be expected to do). However, in 2012 the Council determined that during the recent recession the *nature* of wetland permit applications changed significantly, not just the total number. During the recession, very small projects such as residential decks and house additions constituted a greater portion of the total permit number. Those small projects generally cause less disturbance of wetlands than new housing subdivisions or large commercial projects. To keep the per-permit indicator meaningful across years, it now includes only the permits issued for larger projects such as subdivisions, commercial developments and municipal and utility projects. As it always does when it makes such changes, the Council recalculated the values for all previous years sing the new criteria.

No Swimming at the Shore

Heavy rain caused the average coastal city and town to close its beaches many more days than usual, but not as often as in 2011.



The Council adds up the number of days that each coastal city and town closed one or more of its public beaches, and calculates an average for all the cities and towns with beaches. The cities and towns on the western half of the state's shoreline usually have a higher frequency of closings.

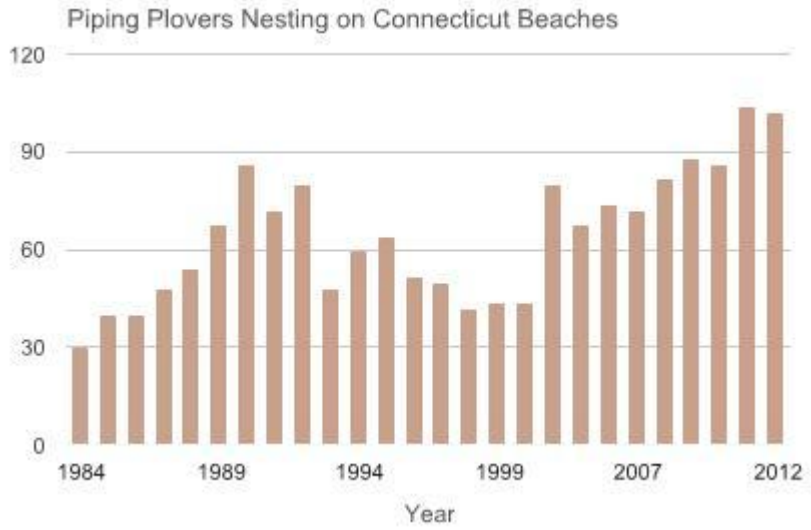
Yearly variations generally are products of rainfall patterns and unusual incidents such as sewer-line ruptures. The storms of 2011 (including Tropical Storm Irene) resulted in many closings, as many beaches were awash in debris, contaminated runoff and raw sewage.

In typical years about half of beach closings are due to tests showing elevated levels of bacteria. Polluted surface runoff or sewage overflows after rainstorms are the most common sources of the bacteria. Most other closings are precautionary, as health officials must assume that heavy rains will wash polluted runoff and/or overflow from combined sanitary/storm sewers.

Connecticut's goal is to eliminate beach closings caused by discharges of untreated or poorly treated sewage, a common cause of elevated bacteria levels.

Piping Plovers on the Beach

Fifty-one pairs of these threatened shorebirds nested on coastal beaches from Stratford to Stonington, one pair fewer than 2011.



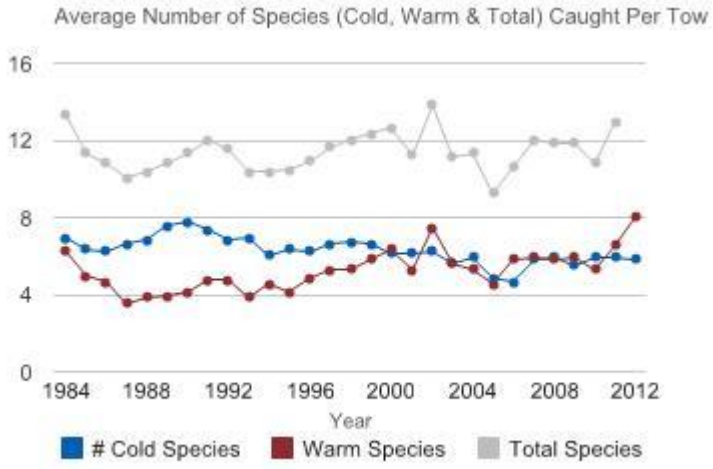
Piping Plovers are small shorebirds that nest only on sandy beaches with sparse vegetation. Human intrusion, storm tides and predators frequently destroy nests.

Hurricane Sandy rearranged many of the beaches where plovers and other shorebirds usually nest. Researchers and conservationists expect to see changes in nesting areas in 2013.

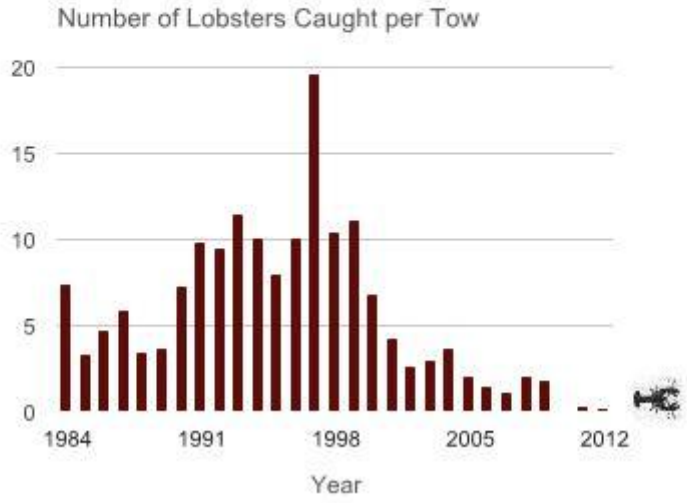
Although the number of plovers on Connecticut's beaches now exceeds the initial recovery goal that was set in the 1980s, the species continues in threatened status at the state and national level. Nesting adults are counted (and in most cases protected) every spring by the U.S. Fish and Wildlife Service, DEEP and volunteers working with the Connecticut Audubon Society, The Nature Conservancy, Audubon Connecticut, and local organizations such as the Friends of Milford Point and Stratford Great Meadows National Wildlife Refuge. The protections afforded these plovers also benefit other nesting species, including American Oystercatchers and Least Terns, which also are threatened species in Connecticut. Their habitat is a narrow strip squeezed between a rising Sound and higher ground. Since protection and monitoring efforts began in 1984, nesting success has improved, resulting in more returning adults in subsequent years. Yearly variations can occur when adult birds move from one state to another.

Life and Depth of Long Island Sound

Life in the Sound is changing. Fish from warmer regions are moving in as species adapted to cold water are heading north. The water is warming and rising.

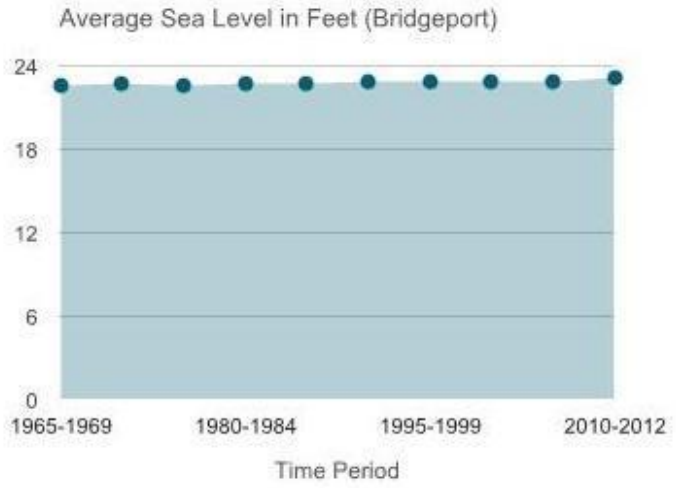


The lobster population of Long Island Sound has failed to recover.

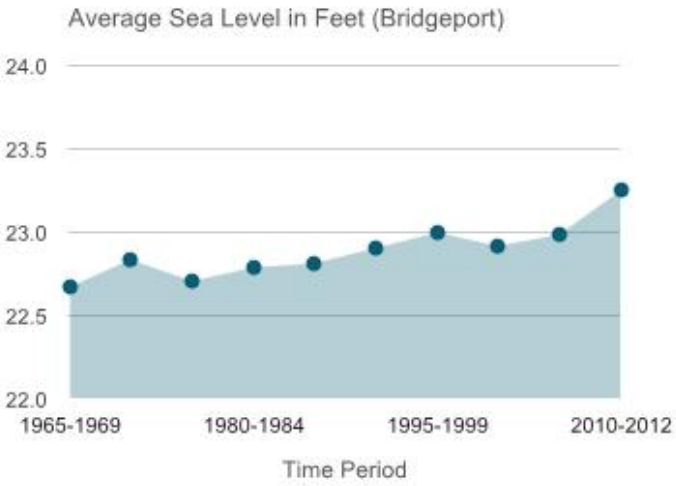


DEEP surveys marine fish, squid and lobster populations every spring and fall by towing nets from a research vessel. The top graph shows the number of fish species caught during the spring survey. The trend toward species that favor warm water is apparent.

The second chart shows the number of lobsters caught in the average tow during the fall survey. The number caught in 2011 was the lowest ever until that record was broken in 2012. This is the nadir of a well-documented, decade-long decline in the lobster population that also is evident in a dramatic drop in commercial lobster landings during the same period (not shown). Researchers are focusing on a combination of four possible causes for the dramatic downturn in lobster populations since 1999: disease, changes in water quality, changes in climatic conditions and human impacts to the Sound. Research to date suggests that a trend toward warmer water temperatures is an important factor in the decline.



The average temperature of surface water in Long Island Sound has been rising. When the surface water is much warmer than the deep water during the summer, hypoxia is likely to be a problem. The chart on the left shows that the water level of the Sound also has been rising since the 1960s, and more recently at a greater rate. Residents of the shoreline are well aware of the rising water level, and scientists have predicted that sea level along the northeast coast of North America will rise faster than seas worldwide.



To get a clearer look at how sea level is rising more quickly now than in years past, the data in the chart above are shown at left in finer detail.

The changes in marine life, temperature and sea level are signs of a warming Sound. The Long Island Sound Study is working on a "sentinel" monitoring strategy that will track changes in the Sound related to climate change. If successful, that strategy will help Connecticut residents understand the changes in the Sound more fully. In the meantime, change is ongoing and Connecticut will need to pay close attention, as gradual change can become sudden change.

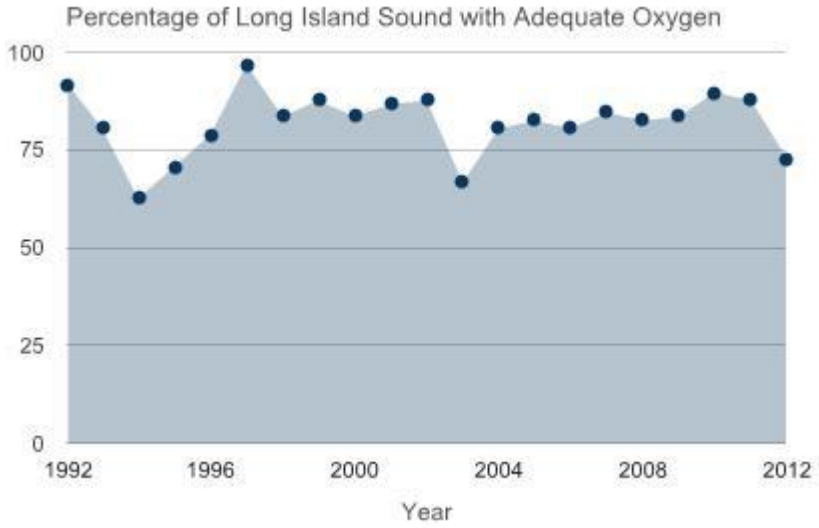
Technical Notes

1. Lobster data for 2010 are absent because repairs to the research vessel *John Dempsey* precluded the fall Long Island Sound trawl survey.

2. The bottom charts show the average level of the Sound at a point in Bridgeport, expressed as the number of feet above a standard reference point.

Pollution in Long Island Sound

The area of the Sound with adequate levels of oxygen declined substantially in 2012.

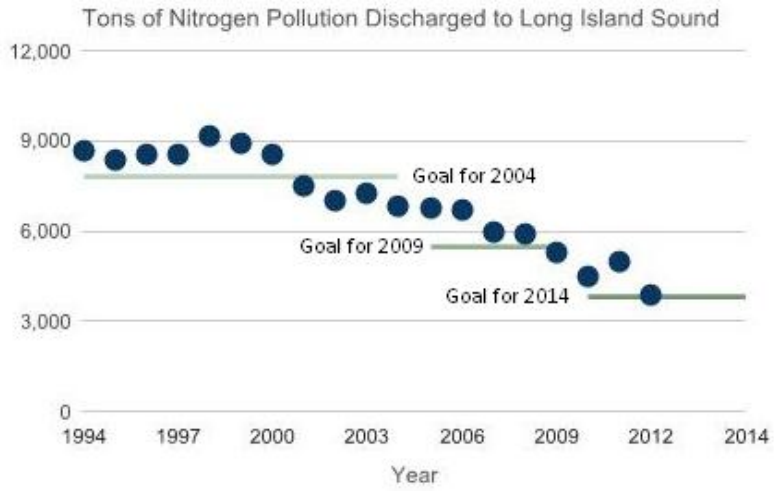


Marine life requires oxygen. The percentage of Long Island Sound that has adequate oxygen all year long is shown in the chart above. During the summer, some areas of the Sound experience hypoxia, which is a condition in the water where oxygen levels are not adequate to fully support desirable forms of life, including fish and lobsters. Hypoxia occurs when the nitrogen in pollution stimulates excessive growth of aquatic plants, which die and get consumed by oxygen-using bacteria. Connecticut's goal is to "eliminate the adverse impacts of hypoxia resulting from human activities." Hypoxia occurs predominantly in the western portions of the Sound. Weather greatly influences hypoxia, making year-to-year changes less important than long-term trends.

To reduce the nitrogen inputs that cause hypoxia, Connecticut and New York adopted a comprehensive management plan in 1994, and built upon that plan with an expanded agreement in 2002.

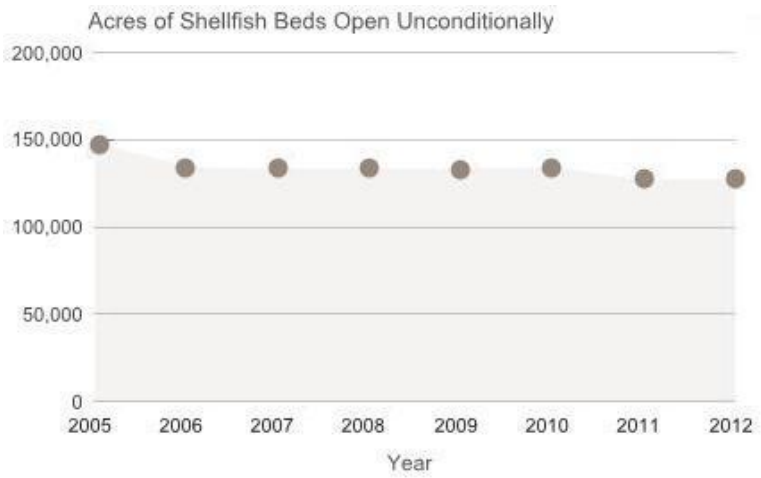
Connecticut's share of the total nitrogen pollution in Long Island Sound is about one-third, and New York's is two-thirds. In 2001, the federal Environmental Protection Agency approved the New York and Connecticut joint plan for implementing a Total Maximum Daily Load (TMDL). The TMDL is the maximum amount of pollutants that can be discharged while still allowing water quality standards to be attained.

The graph below tracks the amount of nitrogen discharged to the Sound and major rivers by 79 Connecticut sewage treatment plants, two large coastal industrial facilities, and a small group of industrial sources in the Naugatuck River watershed. Connecticut's investments in nitrogen-removal technology at many of those plants have been successful.



Large uncontrolled quantities of nitrogen also enter Long Island Sound when rainfall carries fertilizer from residents' lawns along with the pollutants that have accumulated on pavement.

The area of shellfish beds unconditionally approved for harvesting did not change in 2012.



The Connecticut Department of Agriculture's Bureau of Aquaculture and Laboratory Services monitors shellfish beds and classifies them according to their potential for the harvesting of healthful, uncontaminated shellfish. The third graph above shows the acreage of shellfish beds that are approved for harvesting because they are generally unaffected by pollution. (Even areas that are approved may be closed as a precaution following exceptional rainfalls of three or more inches.) Aquaculture experts have suggested that an increasing volume of runoff from lawns and pavement is flowing further into the Sound, resulting in the shrinkage of the shellfish beds that are fully approved.

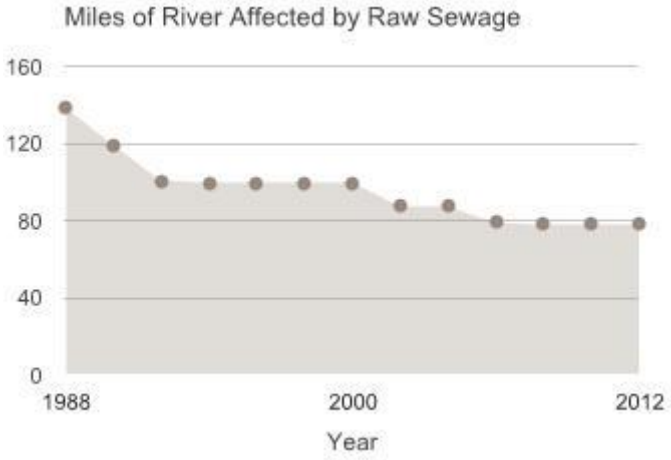
Technical Notes for Pollution in Long Island Sound Indicator

1. The top chart shows the area of Long Island Sound that had adequate oxygen levels throughout each year. The sampling area (2700 square kilometers) does not include the whole Sound (3400 square kilometers). The areas not sampled are shallow waters (less than two meters deep) near shore, which generally do not experience hypoxia; bays; the eastern end of the Sound, which is not expected to experience hypoxia; and an area in the far western end, which probably becomes hypoxic in most years.

2. Hypoxia was redefined by DEEP in 2011. Areas of the Sound are now considered hypoxic where a liter of water contains less than 3.0 mg of dissolved oxygen. This is the criterion that was used prior to 2004. From 2004 through 2010, DEEP used 3.5 mg/l as the determining level. The threshold was returned to the 3.0 level in 2011 to be consistent with the definitions used by New York and the Long Island Sound Study. Data for all previous years have been recalculated to show the area of the Sound having adequate oxygen under the current definition (that is, at least 3.0 mg/l).

No Swimming in the River

About 80 miles of rivers receive overflows of raw sewage during storms.

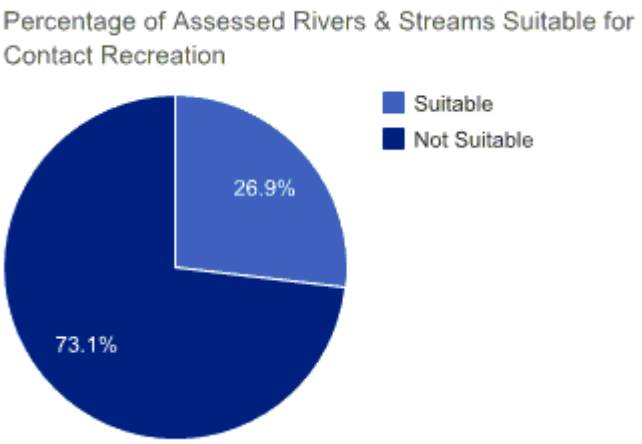


Top Chart: In fourteen Connecticut cities and towns, sanitary sewers were built in combination with storm sewers. During storms, these systems carry more water than their treatment facilities can handle, and a combination of storm water and untreated sewage overflows directly into the rivers and Long Island Sound. Several of these combined sewer systems have been completely or partly separated since 1990, reducing the impact of untreated sewage on rivers. The improvement in 2001 can be attributed to the completion of projects in the towns of Waterbury and Naugatuck. In 2005, the Jewett City project was completed, eliminating overflows of raw sewage into the Quinebaug River.

Connecticut's goal is to eliminate the effects of raw sewage discharges from combined sewer systems. Progress is slow because of the extraordinary expense of separating the sewers.

Throughout the state, only 27% of rivers and streams are classified as being clean enough for swimming and other water contact sports.

The **pie chart** below illustrates the percentage of the state's rivers and streams that are clean enough to fully support recreation. In most sections of rivers and streams, bacteria levels are higher, at least some of the time, than what is considered safe for a person swimming or playing in the water. The Department of Energy and Environmental Protection (DEEP) estimates the portion of rivers and streams that are fully safe for recreation to be about 27 percent. Most streams are not monitored directly; this estimate is based on sampling and some statistical analysis by DEEP. The current figure of about 27 percent is explained further in the 2012 Integrated Water Quality Report submitted by DEEP to the federal government and approved by the federal government on January 30, 2013. The 2011 edition of that report estimated the percentage of fully safe rivers and streams to be about 11, while the 2008 edition of that report estimated the percentage to be 15.

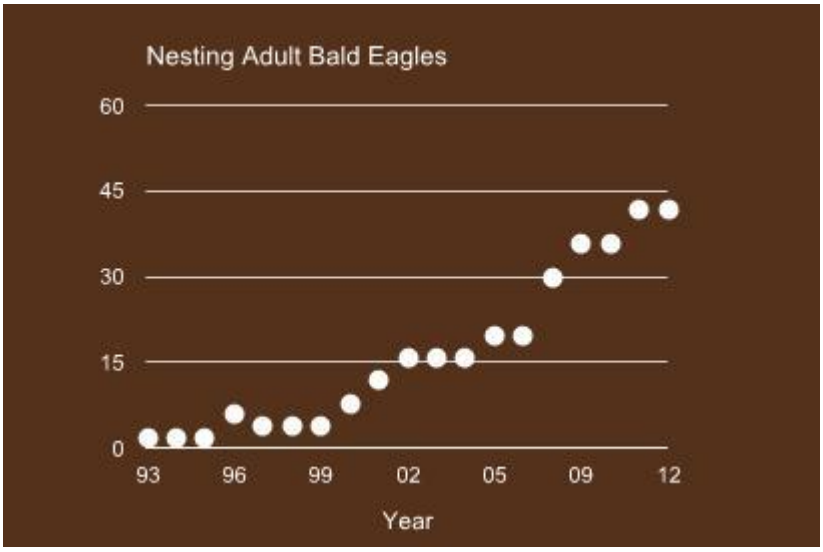


A separate statistical analysis performed by DEEP estimates that 47 percent of *wadeable* streams (which are streams shallow enough to be sampled using methods that involve wading) are suitable for recreation that involves contact with the water.

Apparent fluctuations in year-to-year results are probably due to limitations in data collection and not to widespread changes in water quality. The important conclusion of all the analyses is that the water in most Connecticut streams and rivers might not be safe for human contact.

Bald Eagles

Bald eagles have come back to Connecticut, even to cities. The chemical pollutants that interfered with their reproduction have been controlled, and large trees along fish-rich rivers offer good nesting sites.



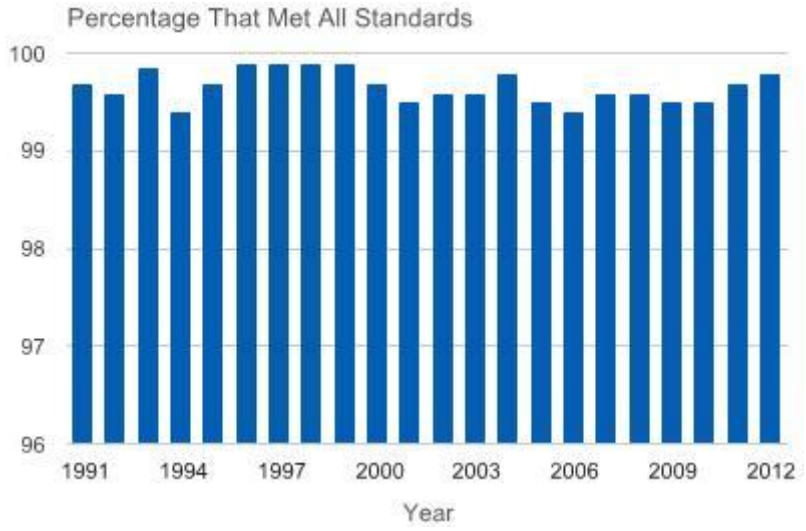
Bald eagles stopped breeding in Connecticut in the 1950s. The species declined throughout the lower 48 states and was declared endangered in 1967. A variety of environmental conditions harmed the eagle, including the widespread use of certain chemicals (chlorinated hydrocarbons) that accumulated in its prey (mostly fish). When those chemicals were banned and polluted waterways were improved, the bald eagle was able to reproduce again. Young eagles were reintroduced into nearby states in the 1980s, and a pair found their way to Connecticut in 1991 and successfully raised a family in 1992. Many more pairs have since found acceptable nesting habitat on land protected by government and private landowners including utility companies. DEEP monitors the eagles with the help of the Bald Eagle Study Group and other volunteers.

The federal government removed the bald eagle from its list of threatened and endangered species in 2007. In 2010, Connecticut changed the eagle's in-state status from endangered to threatened. The 1983 Northern States Bald Eagle Recovery Plan established a goal for Connecticut of 20 breeding birds (10 nests), which was reached for the first time in 2005. The population of bald eagles is included as an indicator because the eagle is representative of species, especially predators, that share similar habitat requirements: large areas of relatively undisturbed land near rivers or lakes where the birds can find adequate supplies of fish and other prey that are – very importantly – only minimally contaminated.

Bald eagles can be seen fairly frequently where for decades they were scarce. On one morning in March of 2013, for example, 15 bald eagles were reported by experienced birdwatchers at Wethersfield Cove, only three miles from the State Capitol.

Public Drinking Water

Most water companies delivered water that met health standards in 2012.



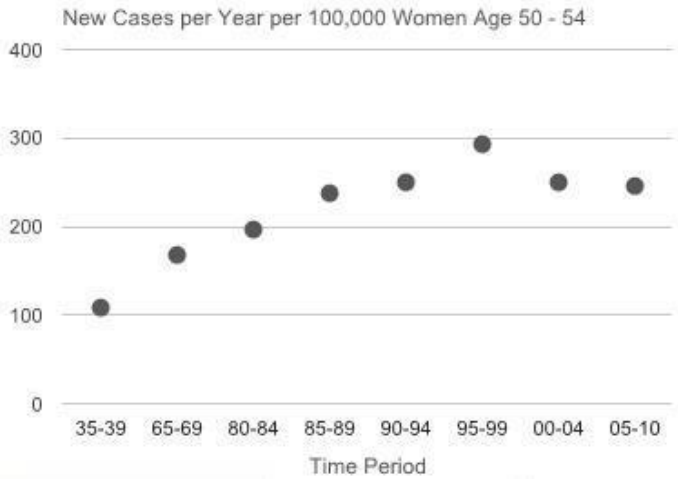
Every public water utility submits monthly quality reports to the Department of Public Health. This indicator shows the percentage of monthly reports that demonstrate full compliance, after weighting the reports to account for the number of people served by each utility. Though long-term problems occur, they are rare in large systems, with the exception of the downturn in 2005 and 2006 caused by a few short-term problems in larger systems. This indicator would show greater fluctuations if the larger systems failed to deliver good water. The most commonly encountered contaminants include bacteria and byproducts of disinfection, with an assortment of other chemicals and radioactive substances.

Data are not completely comparable across all states, but federal reports suggest that Connecticut is among the very best in delivery of safe water from public supplies.

About 85 percent of people in Connecticut are supplied by the public water systems included in the chart above. The other 15 percent rely on private wells, which are not monitored by any government agency and are not counted in this indicator. An unknown but significant number of private wells are contaminated by pollution or naturally-occurring toxins such as arsenic. Residents who drink from private wells are not required to test their water, so the number of those people who drink contaminated water cannot be measured.

Breast Cancer in Connecticut

Connecticut has the highest incidence of breast cancer among the 50 states, but has seen improvement since a peak in the late 1990s.



Of every 100,000 women in the state aged 50 to 54, a number will discover each year that they have breast cancer. That number is depicted in this graph. The data for this indicator are from the Department of Public Health's Tumor Registry, which records all known cancer cases in the state. (The Council presents data on this one age group, rather than on the entire female population, to control for factors such as changes in the average age of the larger population; age 50 to 54 is used in each year's report.) To minimize year-to-year fluctuations, groups of years are averaged together. (In other words, each data point on the graph shows the number of new cases in a single year, but that year is actually the average of several years.) While some breast cancers are linked to genetic factors, most are associated with non-genetic factors that include reproductive history and exposure to pollutants that can cause cancer.

Breast Cancer as an Environmental Indicator

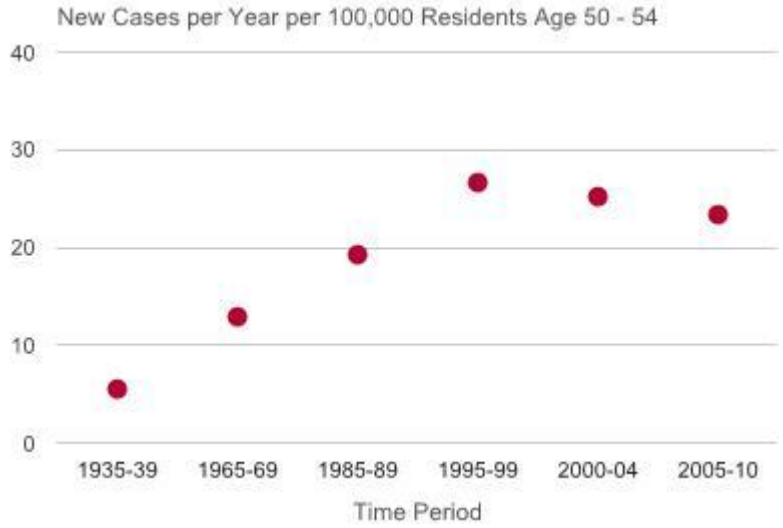
Numerous studies connect breast cancer to environmental factors, which are defined broadly to include any factor not related to a genetic or inherited trait. Some of those factors include a woman's own reproductive history while others include her exposure to radiation and potential carcinogens in food, beverages, air and water. In February 2013, a comprehensive federal report found significant opportunities to prevent breast cancer by targeting environmental factors.

Breast cancer rates vary greatly in different parts of the country. Among the 50 states, Connecticut has the highest incidence of breast cancer. This assessment is based on average incidence rates from 2005 through 2009, the latest years for which 50-state data are available. (Source: Department of Health and Human Services' Centers for Disease Control and Prevention.)

The annual rate of new cases in Connecticut for the 50-to-54 age group showed improvement in 2000 through 2004 and improved again slightly during the 2005 through 2010 period.

Non-Hodgkin's Lymphoma

After steep increases in this cancer during most of the 20th century, the picture has improved.



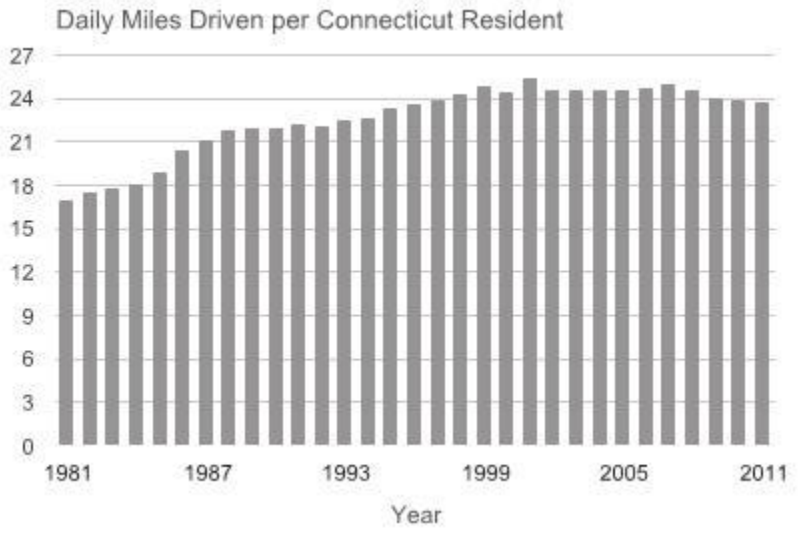
Non-Hodgkin's lymphoma is a cancer of the lymphatic system. The data for this indicator are from the Department of Public Health's Tumor Registry, which records all known cancer cases in the state. (As it does with breast cancer data, this report presents data on one age group, rather than on the entire population, to control for factors such as changes in the average age of the larger population; age 50 to 54 was selected as a representative age group and is used in each year's report.) To minimize year-to-year fluctuations, groups of years are averaged together. (In other words, each data point on the graph shows the number of new cases in a single year, but that year is actually the average of several years.)

Non-Hodgkin's lymphoma has increased markedly since recordkeeping began in the 1930s. The reasons are not well understood, though the rise of Acquired Immune Deficiency Syndrome (AIDS) since the 1980s accounts for some cases. Several studies also cite environmental factors, including exposure to diesel exhaust and certain fertilizers, pesticides and chemicals.

The annual rate of new cases in Connecticut for the 50-to-54 age group showed improvement in 2000 through 2004, and improved again during the period of 2005 through 2010. In 2010 (the most recent year for which Connecticut data are available), there was a one-year increase over the previous year; nonetheless, the average annual rate during the 2005 through 2010 time period still was slightly better than the 2000 through 2004 time period.

Driving Our Cars

Dawn of an era? Nearly every year for 25 years, the average Connecticut resident drove more miles than he or she did in the previous year. That trend shifted into reverse in 2008.

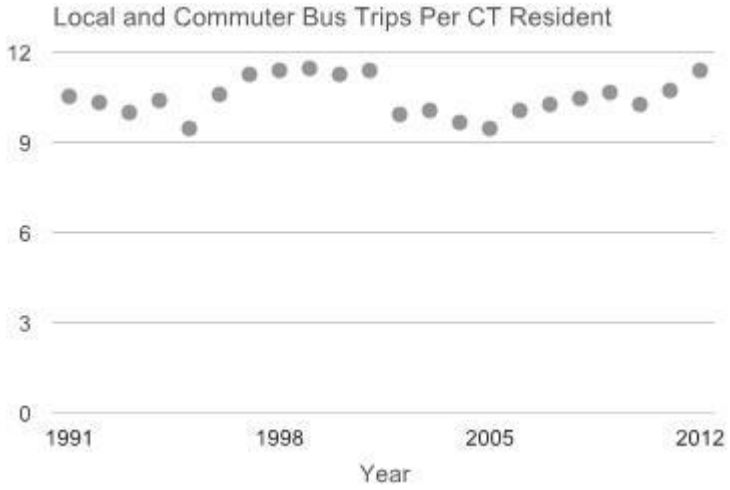


Driving a car, truck or sport utility vehicle is one of the most environmentally harmful activities a Connecticut resident will engage in personally. Impacts are direct (air pollution, oil leakage, etc.) and indirect (causing demand for new roads). The Department of Transportation estimates the total miles driven each year in Connecticut. Every year from 2000 through 2007, the average Connecticut resident drove more miles than in previous years. The reasons for the decades of increasing auto use are complex and include the fact that most new development was accessible only by private vehicle. A decline in miles driven began in 2008 and has continued to 2011 (the latest year for which data are available). The Connecticut trend lagged slightly behind the national trend for driving, which showed a dramatic drop in 2007. The national trend towards less driving is being led by the 16-to-34-year-old segment of the population.

*Personal Impact indicators illustrate trends in behavior or practices that can be expected to influence the condition of tomorrow's air, water, land and wildlife.

Taking the Bus

The average Connecticut resident took the bus at a frequency not seen since 2001.



The number of in-state local and commuter bus trips taken by the average resident per year has been on a general upward trend since 2005. Riding a bus is just one way to avoid the negative environmental consequences of driving a car. Ridership data are collected by the Department of Transportation. In 2012, Connecticut residents rode the bus more times than they had since 2001.

* Personal impact indicators illustrate trends in behavior or practices that can be expected to influence the condition of tomorrow's air, water, land and wildlife.

Compliance

Compliance with environmental laws and regulations at inspected facilities declined slightly.

The role of compliance has changed. For decades, the extent to which people, companies and government complied with environmental laws had a major effect on the condition of the state's environment. As compliance improved, so did the air, water, wildlife and other natural resources. With a few notable exceptions, such as some municipal sewage treatment facilities that still pollute large bodies of water, the current environment owes more to past compliance efforts than to current ones. According to the Council's analysis of enforcement data in 2012, most violations and enforcement actions now relate to the prevention of problems, especially petroleum leaks and spills. Enforcement and compliance remain an important component of maintaining an inhabitable state, but no longer should Connecticut residents expect higher compliance rates to lead to dramatic improvement in statewide environmental indicators; improvement will depend on other factors.

Who is breaking Connecticut's environmental laws, and how is the environment affected?

To find out, the Council evaluated all 944 Notices of Violation (NOVs)** issued by DEEP in a year. The conclusions are summarized in an April 2012 staff memo and the violators are characterized in a series of charts. The overwhelming majority of businesses where violations were found were small companies, and most violations were related to the storage, transport or distribution of petroleum. The largest group, by far, were gas stations and convenience stores.

Only seven percent of NOVs were issued to manufacturers with more than 20 employees, fewer than the number issued to individual citizens. When the largest groups of violators are

brought into compliance, the risk of spills, leaks and local contamination incidents should be reduced, but the result will not move the environmental indicators in this report.

This chart above shows the approximate percentage of inspections performed by DEEP*** that found the inspected facilities in full compliance with pertinent environmental laws and regulations. (Monitoring data self-reported by permit holders are not included here.) In 2010 and 2011, DEEP stepped up enforcement activity in its underground (petroleum) storage tank program and issued many more Notices of Violation (NOVs) than in previous years.

The overall compliance rate rarely has been better than 90 percent and lately has declined. Generally, compliance with air quality regulations is higher than with waste and water regulations. The average compliance rate for all programs declined from 90 percent in 2008 to 83 percent in 2011 and 2012. (The sharp downturn of 2002 was due to a surge in NOVs in a single air program, Stage II Vapor Recovery at gas stations.)

The number of inspections (not shown) declined nearly every year since 1997. The 4,765 inspections conducted in 2012 marked the lowest number ever and about one third the number conducted each year in the late 1990s. The relationship, if any, between the number of inspections and rate of compliance is uncertain. The relative stability of the compliance rate in the face of ever-diminishing staff resources might be regarded as a success for DEEP.
However, Connecticut -- government, businesses and residents together -- has failed to advance toward the goal of full compliance.

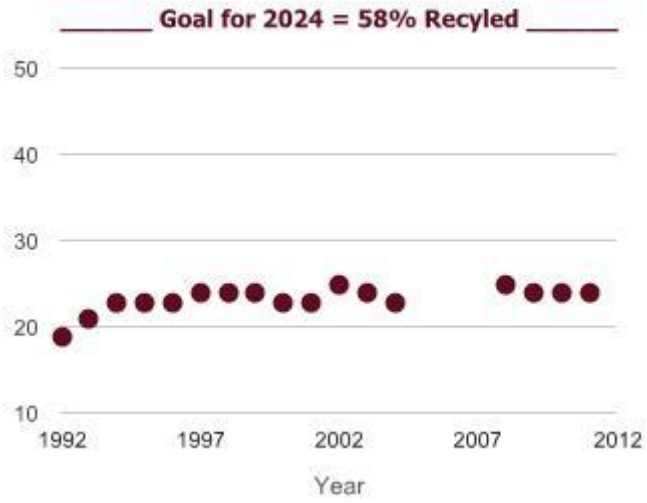
*Personal Impact indicators illustrate trends in behavior or practices that can be expected to influence the condition of tomorrow's air, water, land and wildlife.

**Notices of Violation (NOVs) are informal enforcement tools, generally issued whenever DEEP detects one or more violations at a facility. They carry no financial penalty. The recipient has 30 days to respond. They can be issued for relatively minor or major violations; in cases of the latter type, the recipient might also receive an order, which might carry a financial penalty. NOVs typically outnumber orders by a factor of five or more in any year. NOVs are good indicators of trends in violations because almost all violations found through inspections result in NOVs.

***Some inspections of compliance with air quality regulations are conducted by the Department of Consumer Protection pursuant to an agreement with DEEP; these inspections also are used in calculating compliance rates.

Recycling Rate

Despite numerous reports of upturns in local recycling rates as communities adopt single-stream recycling, progress toward the statewide goal remains elusive.



The General Assembly established a goal of reducing and recycling 40 percent of Connecticut's municipal solid waste by the year 2000 (Sec.22a-220(f)). That goal was never met, and the consequences have been enormous. Thousands of heavy trucks hauling waste to landfills hundreds of miles away have put 300,000 or more pounds of diesel pollutants into the air yearly. Another consequence is financial: each ton that is not recycled or avoided altogether and is sent instead to a resource-recovery facility or landfill costs a municipality, hauler or resident from $40 to $93, according to a 2010 report of the Legislative Program Review and Investigations Committee.

In 2006, DEEP amended the State Solid Waste Management Plan to include a goal of diverting 58 percent of Connecticut’s municipal solid waste stream from disposal by 2024. This would be accomplished through recycling, composting and waste reduction (such as use of lighter packaging material). If this goal is met, Connecticut will be able to manage all of its garbage without exporting it.

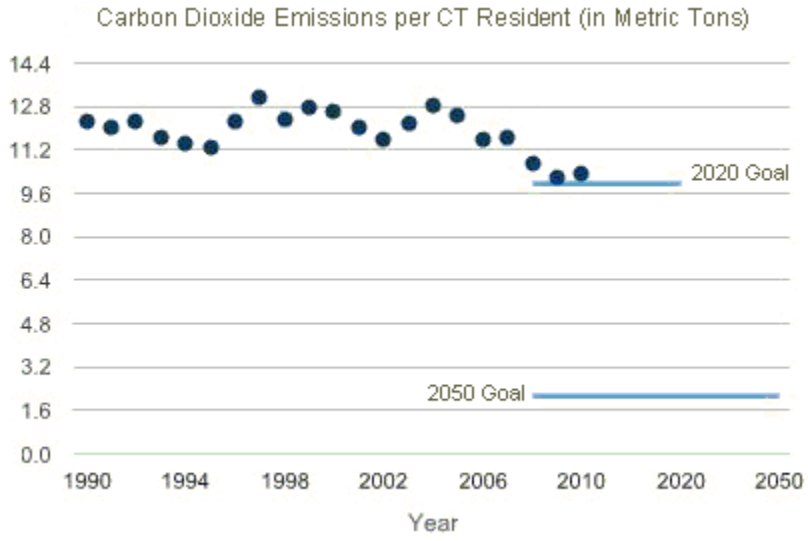
In December 2012, the Modernizing Recycling Working Group submitted a report to Governor Dannel P. Malloy that charts numerous routes to a future where much more waste is recycled and avoided. The report also includes excellent and ultimately discouraging data that shows how poorly Connecticut's recycling rates compare to other states and countries. In addition to the low recycling rate, the report estimates that only about 60 percent of bottles and cans are returned for deposit. Numerous communities have reported better recycling rates after adopting single-stream recycling, but statewide improvement has yet to be realized. Low rates of recycling at some apartment buildings, schools and other facilities keep the overall rate low.

Technical Note: DEEP reports suggest that the reported recycling figures depicted on the chart might underestimate actual recycling rates slightly. No data are available for 2005 through 2007.

*Personal Impact indicators illustrate trends in behavior or practices that can be expected to influence the condition of tomorrow's air, water, land and wildlife.

Climate Changers

The average Connecticut resident's contribution to the build-up of carbon dioxide in the atmosphere improved over five years before reversing in 2010 (the year of the most recent data).



Certain gases in the air function like the glass of a greenhouse: they allow the sun's energy to pass through the atmosphere to the ground, then trap the heat that radiates from the ground. These gases are often called "greenhouse gases." Worldwide, a build-up of greenhouse gases is contributing to the ongoing rise in temperature. Carbon dioxide is not the only greenhouse gas nor even the most powerful, but carbon dioxide emissions are far greater in quantity than the others. The chart above shows the total amount of carbon dioxide emitted from the burning of petroleum, natural gas and coal in Connecticut divided by the population.

State law sets two goals for reducing greenhouse gas emissions: reduce statewide emissions to 10 percent below 1990 levels by 2020 and 80 percent below 2001 levels by 2050. The chart above shows emissions per Connecticut resident, not total emissions, and therefore displays the goals after adjusting them to account for the larger population that is projected for 2020 and 2050. Hundreds of thousands more people are expected to be living in Connecticut in 2020 and 2050, so the average resident will have to work that much harder to reduce carbon dioxide emissions if the statewide goal is to be met.

Most human-generated carbon dioxide results from burning fuels in houses, businesses, power plants and, the largest source, vehicles. Connecticut is more energy-efficient than the nation as a whole, and thus the average Connecticut resident's contribution to global climate change is less than the average American's.

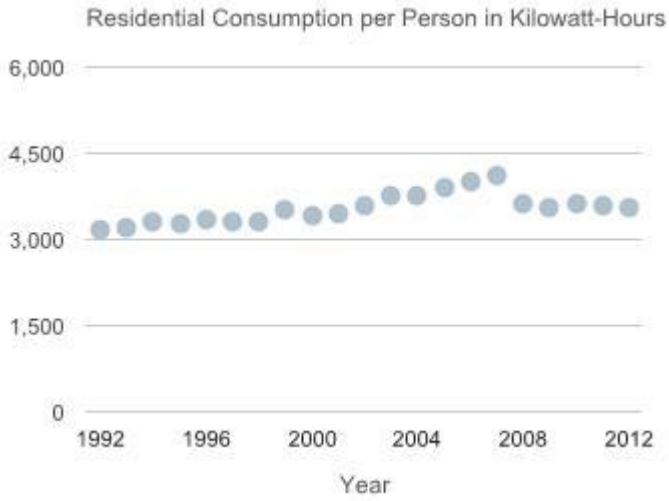
The most recent data available are from 2010.

*Personal Impact indicators illustrate trends in behavior or practices that can be expected to influence the condition of tomorrow's air, water, land and wildlife.

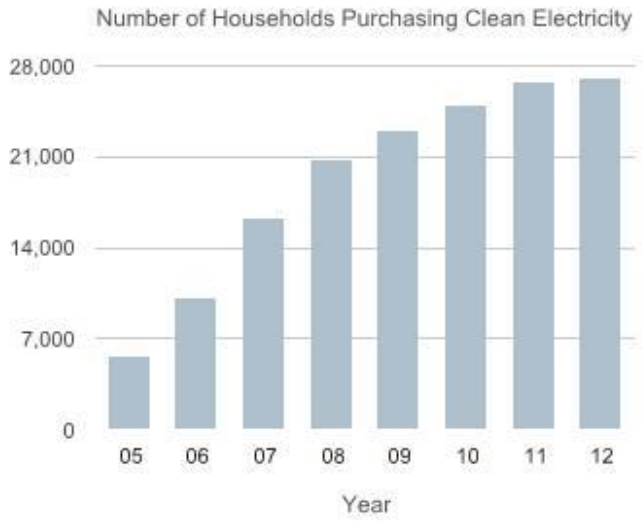
Electricity at Home and Work

At Home:

The average Connecticut resident used slightly less electricity at home in 2012.

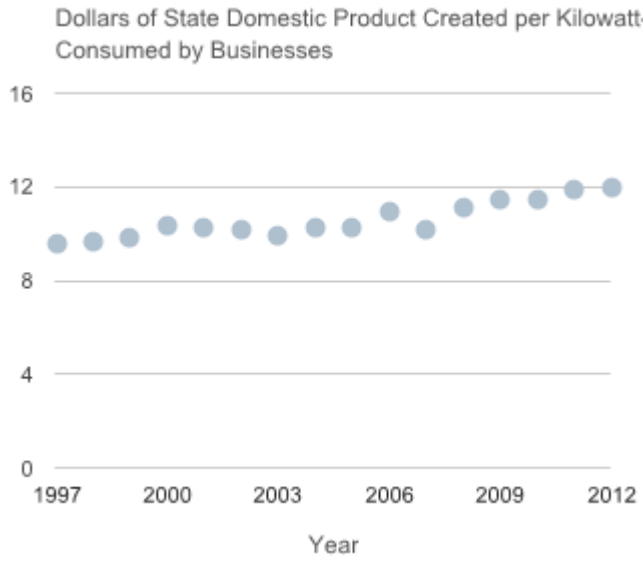


From 2005 through 2011, thousands of households changed suppliers to buy electricity generated from renewable energy sources. Far fewer signed up in 2012.



At Work:

For five years in a row, Connecticut businesses used electricity more efficiently to produce goods and services.



Details

Efficiency at Home: The average Connecticut household has been consuming less electricity since the peak usage year of 2007, despite a brief reversal in 2010. Nonetheless, peak demand remains excessive. According to the Connecticut Siting Council, peak demand occurs during hot, humid summer days when residents use air conditioning. Most Connecticut consumers do not purchase the most efficient air conditioners. (Purchasing data used to be tracked in this report but was discontinued in 2010 when reliable data became unavailable.) Excessive electricity consumption in the summertime has had significant environmental consequences. On the hottest days, Connecticut's base-load power plants are unable to meet the additional demand, and older petroleum-fueled plants are brought on line. Because they are used sporadically, many of these older plants are permitted to operate with no pollution control equipment. As a result, state residents generate the most air pollution on the hottest summer days when air quality is already bad.

The vast majority of Connecticut's electricity is generated from nuclear energy and the combustion of natural gas, oil and coal. Hydropower, solar and other renewable resources are small but growing sources of electricity. Each source, renewable or not, has its own negative environment consequences. Reducing those consequences will require Connecticut households to use electricity much more efficiently. Such efficiency can be attained in part with ENERGY STAR appliances.

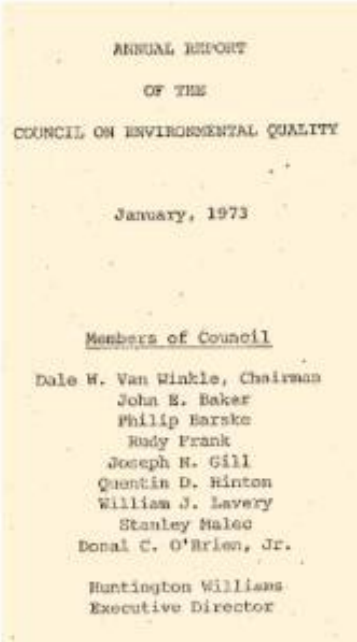
Buying Cleaner Electricity: The CTCleanEnergyOptions program enables customers to purchase electricity from renewable sources, especially wind. Participation has grown steadily though the rate of increased participation is slowing. The electricity that actually enters these houses is not necessarily from renewable sources. The consumer who elects this option is paying for the generation of renewable electricity on the regional electric grid. This reduces the amount of electricity that otherwise would be generated by nuclear, coal, oil and natural gas-fired generating plants, all of which create pollution. CTCleanEnergyOptions is a collaborative program administered by the Clean Energy Finance and Investment Authority.

Efficiency at work: The bottom graph shows the trend in the efficiency with which Connecticut's economy uses electricity to produce goods and services. Connecticut's businesses generally have been using less electricity to produce a unit of goods or services. State Gross Domestic Product (GDP) represents the total value of goods and services produced within the state in a single year. In 2012, the federal Bureau of Economic Analysis put Connecticut's GDP at $229 billion (current dollars). When adjusted for inflation, that amount is a slight (0.1 percent) decline from 2011. Over that same time, Connecticut businesses reduced their electricity consumption by 1.4 percent.

*Personal Impact indicators illustrate trends in behavior or practices that can be expected to influence the condition of tomorrow's air, water, land and wildlife.

Activities of the CEQ in 2012

January 2013 marked the 40th anniversary of the Council's first annual report.



ANNUAL REPORT

OF THE

COUNCIL ON ENVIRONMENTAL QUALITY

January, 1973

Members of Council

Dale H. Van Winkle, Chairman
John E. Baker
Philip Barske
Rudy Frank
Joseph H. Gill
Quentin D. Hinton
William J. Lavery
Stanley Malec
Donal C. O'Brien, Jr.

Huntington Williams
Executive Director

The 11 typewritten pages offer a (grimy) window on a Connecticut that is forever in the past. Most readers of this 2012 report have never breathed anything as bad as the air breathed by Connecticut residents during the early 1970s and probably never will.

To write that first report, members and staff relied greatly on subjective judgments. Reliable data were scarce. Today the Council has access to much more data to analyze the state's lingering and persistent environmental problems (though, as noted throughout this report, some data still are lacking), and its reports should be expected to be more precise and unerring. To fulfill that expectation, the Council was as busy in 2012 as it ever has been.

Research and Reports

The Council published *Environmental Quality in Connecticut* in June 2012. That report highlighted nationwide data that reveals the unusual extent to which Connecticut residents live in close proximity to forests and other wildlands. Two products of that proximity are power outages and high rates of participation in wildlife watching and similar activities, both of which need to be considered in state laws and policies.

The Council is required to recommend legislation for "identifying the deficiencies of existing programs and activities." The Council submitted those to Governor Dannel P. Malloy in January 2013.

From time to time the Council asks staff to prepare updates to previous reports. Examples from 2012 include a staff memo that analyzes progress toward the recommendations of *Great Infestations*, the 2002 CEQ special report on invasive species, and a staff memo analyzing all enforcement data from 2011.

Review of State Projects and Programs

Council research in 2010 found that one of the most polluting power plants in the state is located in Hartford and is generally used on the hottest days of the year when air quality is

already at its worst. In January 2012, the Council took the unusual step of submitting detailed comments when the air quality permit for the plant was proposed for renewal. In August, a new permit was issued that incorporated many improvements including a switch to ultra-low sulfur fuel. The Council commended DEEP and the applicant for reducing air pollution from the plant.

All agencies submit their environmental impact evaluations (EIEs) of proposed projects for the Council's advice. In 2012, the Council submitted detailed comments on three major projects, including an airport expansion, a subsidized housing project and new sources of water for the University of Connecticut.

Sometimes the Council's roles in soliciting public comment and responding to citizen complaints (see below) intersect with the Council's duties to advise state agencies. When the Council held a public forum in Mansfield in 2011, it was reminded that the University of Connecticut still had not moved its hazardous waste storage facility out of the drinking water supply watershed despite years of plans, EIEs and public input. In 2012, the university again announced a plan to evaluate alternative locations; the Council advised the university to put a priority on sites outside the watershed, and followed the site evaluation process closely. In late 2012 an advisory committee rated the current site as the least favorable among the alternatives. An EIE will be conducted in 2013.

The Council continued to improve the *Environmental Monitor* to accommodate changes in CEPA, most recently to add public notices in cases where agencies decide not to complete an environmental impact evaluation after it has conducted a public scoping process. The Council also continued to take steps to help modernize CEPA.

Citizen Complaints

As noted in reports of the past three years, citizens of Haddam have spoken repeatedly to the Council about contamination of land and groundwater that has existed in their community for more than 25 years. The Council decided to follow this case closely to learn why the start of remediation in some communities is delayed for decades (if it ever occurs). In September 2012, the Council submitted a detailed letter to Governor Dannel P. Malloy to update him on the problems in Haddam "and the broader problems made evident by this case." As of March 2013, there has been some study by potentially responsible parties as well as additional legal and bureaucratic action but, to date, no remediation.

The following are a sample of the many other complaints investigated in 2012:

- An inquiry into the status of a state-owned brownfield property that had been made available to potential developers under legislation adopted in 2012. The Council's investigation showed that, pursuant to prior legislation, at least ten acres of the land were to be preserved in a natural state. The Council notified the Department of Economic and Community Development and was assured that the preservation requirement will be fulfilled if the land is ever transferred.

- A species of bamboo that can escape from cultivation and cause a number of problems.

- Questions about the state's enforcement of littering and dumping laws on state properties.

- The lack of notification of neighbors when state-owned railroad property is sprayed with herbicides.

The Council researched all of the complaints it received and offered recommendations to the relevant state agencies, where warranted. Some problems, such as excessive pollution from outdoor wood furnaces, will require legislative action to correct.

Advice From the Public

In November, the Council released its required recommendations for corrective legislation in draft form, and invited the public to weigh in. Public officials, businesses, advocacy organizations and individual citizens spoke to the Council at a public forum held in the Legislative Office Building in Hartford, and many others submitted written comments. Read a complete summary. Their insights, technical advice and opinions helped the Council greatly in preparing its final recommendations, which were submitted to Governor Dannel P. Malloy and the General Assembly in January 2013.

In addition to the dozens who spoke at the public forums, the Council heard from organizations at regular monthly meetings. These included DEEP, the University of Connecticut, Connecticut Coalition for Environmental Justice, Connecticut Invasive Plant Working Group, Invasive Plants Council, Rivers Alliance of Connecticut, Naubesatuck Watershed Association, Connecticut Land Conservation Council, Environment and Human Health, Inc. and others.

Many people across the state expressed their concerns during 2012. The Council worked to address them all, and truly appreciates the efforts people made to bring environmental problems to light. The Council looks forward to helping citizens and agencies solve the challenges of 2013 and beyond.

Council Duties

The duties of the Council on Environmental Quality are described in Sections 22a-11 through 22a-13 of the Connecticut General Statutes.

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

2. Review of state agencies' construction projects.

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

In addition, under the Connecticut Environmental Policy Act (CEPA) and its attendant regulations, the Council on Environmental Quality reviews Environmental Impact Evaluations that state agencies develop for major projects. The Council publishes the *Environmental Monitor*, the official publication for scoping notices and environmental impact evaluations for state projects under CEPA. The *Environmental Monitor* also is the official publication for notice of intent by state agencies to sell or transfer state lands.

CEQ Members in 2012

Barbara C. Wagner
(member and chair through March 27, 2013)
Resident of Glastonbury. Attorney with law office in Glastonbury, specializing in commercial and residential real estate. Executive Director, Wind Hill Community Farm, Glastonbury. Member, Glastonbury Town Council, 2000-2010. Co-Founder and Board Member of Town Center Initiative, addressing walkability issues in Glastonbury's center. Board of Trustees, Diamond Lake Land Trust. Former member, State Open Space and Watershed Land Acquisition Board.

M. Howard Beach
(member through January 2013)
Resident of Simsbury. Conservation & Zoning Compliance Officer / Planning Analyst, Town of Simsbury. Member, Simsbury Conservation / Inland Wetlands Commission from 1980 to 2004, Chairman from 1994 to 2004. Member, Board of Directors, The Farmington River Watershed Association, 2004 to 2006. Life Member and past Board Member, Simsbury Land Conservation Trust. Founding Member, Farmington Valley Biodiversity Project. Member, Town of Simsbury Open Space Committee, 1999 to 2004. Member, CT Developers Council. Member, Government Affairs Committee, Simsbury Chamber of Commerce. In 2004, completed a Masters Degree in Environmental Law at Vermont Law School.

Janet P. Brooks
Resident of Middletown. Attorney with law office in East Berlin with a practice in environmental, administrative and land use law. Member of the Connecticut Bar Association Planning & Zoning Section and Environment Section. Co-author of *Connecticut Environmental Protection Act*, Volume 15 of the Connecticut Practice Series published by Thomson West. Formerly Assistant Attorney General in the Environment Department of the Connecticut Attorney General's (AG's) Office for 18 years enforcing the state's environmental laws running the gamut from noise, odor, water pollution, air pollution, pesticides to habitat protection and preservation of land. While at the AG's Office, coordinated the wetlands appeal practice and developed the legal training for wetlands commissioners for DEEP's annual training. Recipient of 1984 German Marshall Fund grant to study the effect of citizen participation on hazardous waste clean-ups in four European countries. Based on those experiences, authored a chapter published in *America's Future in Toxic Waste Management: Lessons from Europe.* Staff Attorney for five years at the Connecticut Fund for the Environment, Inc., representing citizens groups in administrative and court proceedings. Began practice of law assisting the Middletown City Attorney in the city's opposition to the utility company's burning of PCB waste oil within the city boundaries.

Liz Clark
Resident of West Hartford.

Bruce R. Fernandez
(member through March 27, 2013)
Resident of Farmington. Retired after 18 years owning and managing a software business serving insurance companies and independent agencies. Prior to that, was a consulting engineer specializing in energy efficient power plants and paper mills, Vice-President of Operations of a small utility serving Bronxville, NY and a jet engine design/test engineer. Masters degrees in Engineering and Management. Served in United States Army Corps of Engineers as small unit commander; served in Vietnam and ten years in Army Reserves. Member, Board of Directors, Farmington Land Trust.

Karyl Lee Hall
Resident of Branford. Attorney with the Connecticut Legal Rights Project. Formerly, with Murtha Cullina, the Connecticut Fund for the Environment and Connecticut Legal Services. Co-Chair, Branford Conservation Commission. Co-chair, Scenic Roads Advisory Committee for Routes 146 and 77. Member, Advisory Board, Branford Land Trust. Vice President, Citizens for Branford's Environment, 2002-2009. Connecticut Bar Association Pro Bono Service Award, 2003. Former Co-chair, State Implementation Plan [for Air Management] Revision Advisory Committee.

Alison Hilding
(appointed June 21, 2012)
Resident of Mansfield. Long-time advocate for the environment and children, viewing clean air and clean water as important dimensions of child advocacy. Member, Connecticut Commission on Children, 2003 to present; Executive Board since 2008, Secretary since 2012. Founding member, Mansfield's Citizens for Responsible Growth. Background in financial management; worked for NYNEX in areas of capital budgeting for growth and modernization. Manages artistic estate of an American Modern artist.

Richard Sherman
Resident of Chaplin. Architectural designer and construction manager of earth sheltered, passive solar and energy efficient residences. Former CEQ Representative to the Route 6 Advisory Committee (during previous term on CEQ). Charter Member, Transit Alliance of Eastern CT, and Citizens for a Sensible Six. Former Organizer, the Progress and Equity Partnership. Member of CEPA Working Group, League of Conservation Voters of CT. Former President, Northeast Chapter of ACLU-CT Board of Directors. Member of Peoples Action for Clean Energy (PACE) and Northeast Sustainable Energy Association (NESEA). Former Chair, Mansfield Transportation Advisory Committee. Former President, Mansfield Commonground. Member, Mansfield Planning and Zoning Design Review Panel. Former Chair, Mansfield Democratic Town Committee. Host and producer of the radio show, "A Distant Shore" on WHUS (91.7 FM, Storrs). Former Public Affairs Director of WHUS. Stopover host, American Tour d'Sol solar electric car race.

Norman VanCor
(member through April 2012)
Former resident of Harwinton (now Spofford, New Hampshire). Owner of Mizzentop Antiquities. Served in United States Marine Corp in Vietnam. Awarded the Navy Cross, Vietnamese Cross of Gallantry and other decorations. One of first ten inductees to CT Veterans Hall of Fame. Former Director, Yankee Energy in sales, marketing, government relations, communications. Founding member and President Emeritus, Quinnipiac River Watershed Association. Former member Rivers Advisory Committee. Former Chairman, Southington Conservation Commission. Former host of radio program on environmental topics. Former President, Southington Water Works. Former member, Board of Directors of Operation Fuel. Active Pheresis donor at American Red Cross with over 37 gallons of whole blood and platelet donations. Former Volunteer Hunter Safety Instructor for the DEEP Conservation Education Program. Certified Master Gardener.

New CEQ Members in 2013

Susan D. Merrow
(appointed February 1, 2013)
Resident and former First Selectman of East Haddam. Member, East Haddam Conservation Commission. Member, Connecticut Advisory Committee, Trust for Public Land. Board Member, Eightmile River Wild and Scenic Coordinating Committee; Former President, Connecticut Conference of Municipalities. Former President, National Board of Directors, Sierra Club. Author, *One for the Earth: Journal of a Sierra Club President.* Trustee, Connecticut River Watershed Association.

James O'Donnell
(appointed February 1, 2013)
Resident of Noank (Groton). Professor of Marine Sciences and Joint Professor of Physics, University of Connecticut. Master of Science and Ph.D. in Oceanography. Elected to Connecticut Academy of Science and Engineering. Has served as a Director of the North East Regional Association of Coastal Ocean Observing Systems and the Middle Atlantic Coastal Ocean Observing Regional Association. Appointed as one of Connecticut's representatives to the Bi-State Commission on Long Island Sound.

Michael Klemens of Salisbury and **Lee Dunbar** of Mansfield were appointed on March 27, 2013, just as this report was being published, and did not have an opportunity to participate in its preparation.

Contact Us

We would like to hear from you. Does this report give you the information on Connecticut's environment that you need? Is there something missing?

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Hartford, CT 06106

Phone: 860-424-4000 (messages can be left 24 hours a day)

Fax: 860-424-4070

E-mail: karl.wagener@ct.gov

Acknowledgments

The Council appreciates the assistance of the many people in the Departments of Agriculture, Energy and Environmental Protection, Transportation and Public Health and the Connecticut Siting Council who provided data.

PHOTO CREDIT: The image on the right side of the first pages of this report is based on a photograph taken on October 22, 2012 in New Haven by Wallingford resident Nick Bonomo. The original format of the photograph, as it appears on Mr. Bonomo's blog, *Shorebirder*, can be viewed at the bottom of this page.

The birds are snow geese, a species that nests on the tundra and migrates to southern states, though small numbers spend the winter along Connecticut's coast and in the Connecticut River valley. During most of the 20th century, snow geese were too scarce to be legally hunted. Snow geese now are among the most numerous waterfowl in North America and are hunted.

Researchers at the Center for Landuse Education and Research (CLEAR) at the University of Connecticut provided very valuable farmland, forest and tidal wetland data, and UConn ornithologists made new data available on long-term population trends of forest bird species.

The Council especially thanks the many citizens, businesses, and organizations who offered information and viewpoints to the Council throughout the year. The many comments received at the public forum in November were particularly helpful to the Council as it prepared its recommendations for legislation.

The Council also appreciates the work of its Executive Director, Karl Wagener, and Environmental Analyst Peter Hearn in drafting this report for review by the Council and preparing the final version for publication.

The Council notes the valuable contributions of Eric Walsh, an intern from the University of Connecticut Law School, and Avery Yoshimine and Courtney Robishaw, interns from the University of Connecticut; their research contributed greatly to this report.

This is an image of the original photograph of snow geese over New Haven. View a larger version on the blog of the photographer, Nick Bonomo.