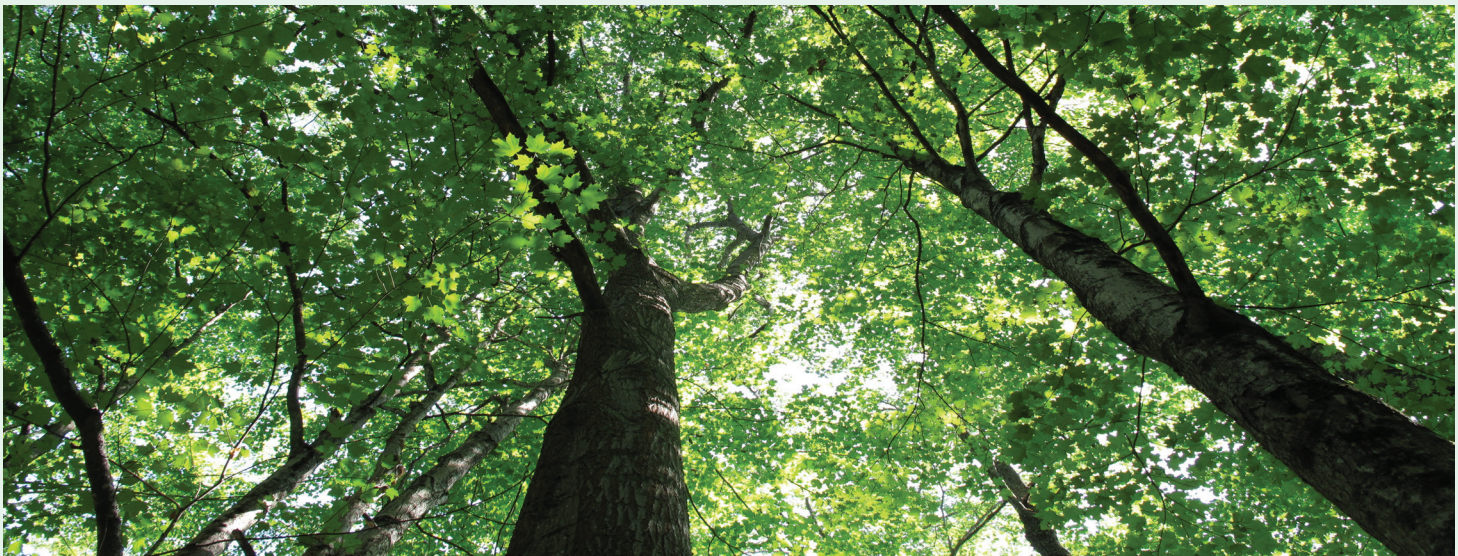
the ECONOMIC IMPORTANCE *of* CONNECTICUT'S FOREST BASED ECONOMY 2015

North East *State* Foresters Association



I. Introduction

Chris Martin,
Connecticut State Forester

Thank you for taking time to learn about the economic importance of Connecticut's diverse forests.
With close to 60% of its land area in forest, Connecticut ranks sixteenth as the most heavily forested states in the nation. Many enjoy and appreciate our State's woodlands for their beauty, recreation values, and private and public drinking water protection. We can thank the families and individuals who own over 70 percent of these woodlands for these benefits that contribute immensely to our quality of life.

While most Connecticut woodland owners do not own their property for the sole purpose of forest product production, their individual decisions to sustainably manage and harvest some of their trees occasionally, collectively makes a significant contribution to Connecticut's forest-based economy and acts as an incentive to retain ownership in its current-use.

This analysis is but one of several identical studies conducted for each New England State and New York. The data therefore can be combined as a whole or by sub-region. This is an important consideration as the Northeast's "wood basket" or as some might say "wood shed" extends beyond individual state borders, especially in Southern New England. In other words it is quite common for trees harvested in Connecticut to be manufactured into hardwood flooring, furniture, cabinetry, or fuel for heat or energy hundreds of miles away in other northeast states. In the same regard, Connecticut manufacturers of these same value added forest products often procure their raw materials from a larger geographic region.

Deriving economic benefits through sustainable forest management is a key ingredient to keeping forests as forests.

Just as dairy farms are often considered the central cog in a vibrant farm community and economy, so is Connecticut's forest product industry to the health, diversity, and resiliency of our treasured wooded landscape. Whether you primarily enjoy Connecticut woodlands for hiking, hunting, fishing, or cutting firewood to heat your home, I hope this publication will help you readily link Connecticut's forest based economy to locally grown and sustainably managed woodlands and the multitude of additional benefits we all enjoy.

Chris Martin
Connecticut State Forester

Acknowledgements: Funding for this report was provided by the North East State Foresters Association through a grant provided by the USDA Forest Service, State and Private Forestry

II. Executive Summary

• Forest area and species – **Connecticut's forests cover 1,799,342 acres** of land or **56% of the State** and have largely been at this level since the 1980s. **Oak/hickory forests make up over 72%** of the forest cover.

• Forest ownership – **Connecticut's forests continue to be largely privately owned by individuals/families and business who together own over 73% of the forest.** The state owns just under 17% of the forests and local government owns 10%.

• Forest inventory, growth vs. harvest – The forests of Connecticut continue to add to the inventory of tree volume as net growth significantly exceeds harvest annually. Currently, **Connecticut's forests grow 96 million cubic feet per year while approximately 13.7 million cubic feet of timber is harvested annually.** Connecticut's standing forest contains 3.1 billion cubic feet (96 billion tons) of timber 5 inches in diameter or larger.

• Value of forest industry economic sectors (see table below) – **The annual Gross State Output of Connecticut's forest products industry totals over $ 2.1 billion while the forest-based recreation economy generates approximately $1.2 billion annually.** Approximately **8,200 workers are employed in the forest products, maple and Christmas tree sectors** while another **4,600 jobs are found in the sectors that include and support the forest recreation economy.**

Gross State Output (sales), Forest-based Manufacturing & Recreation, Connecticut, 2013

		millions of $	jobs
Forestry & logging		25	450
Wood products manufacturing		154	1,300
Furniture and related product manufacturing		418	2,802
Paper manufacturing		1,573	3,550
Wood energy		7	40
Christmas trees and maple syrup		4	58
Total Forest Products		2,181	8,200
Forest Recreation sales		1,200	4,600
	Total	$ 3,381	12,800

Sources: Sources for the table above can be found throughout this document.

Note on economic multipliers – This report does not use economic multipliers for the forest products industry data though the forest recreation data is derived from a multiplier-like data source. Economic multipliers account for the ripple effect that economic activity in a particular industry causes through the economy. Using economic multipliers ususually increases the value of employment, payroll gross domestic product, or sales by 1.4-1.6 times their non-economic multiplier value.

• Economic output and number of jobs in the forest products sector have been reduced since peaks in the early 2000s. This has mirrored similar trends in other manufacturing sectors in the U.S. as more and more manufacturing has moved to other parts of the world.

This report is the first of its kind for Connecticut and is similar to a series of reports that have been published for Maine, New York, New Hampshire and Vermont by the North East *State* Foresters Association since the early 1990s. Its purpose is to capture the economic value of the forest-based economy of the State and provide analyses of trends for key economic indicators. The sectors covered in this report include forestry and logging, related trucking, wood products manufacturing, wood furniture and related products manufacturing, pulp and paper manufacturing, wood energy, and the forest-based recreational economy that includes camping, hiking, hunting, downhill skiing, cross-country skiing, snowmobiling, fall foliage viewing, and wildlife viewing.
Data for this report come from federal, state and private sources. For a full list sources, please see citations at the end of this report.

We would like to thank the many people who assisted with the development of this report including Chris Martin and Douglas Emmerthal of the Connecticut Division of Forestry.

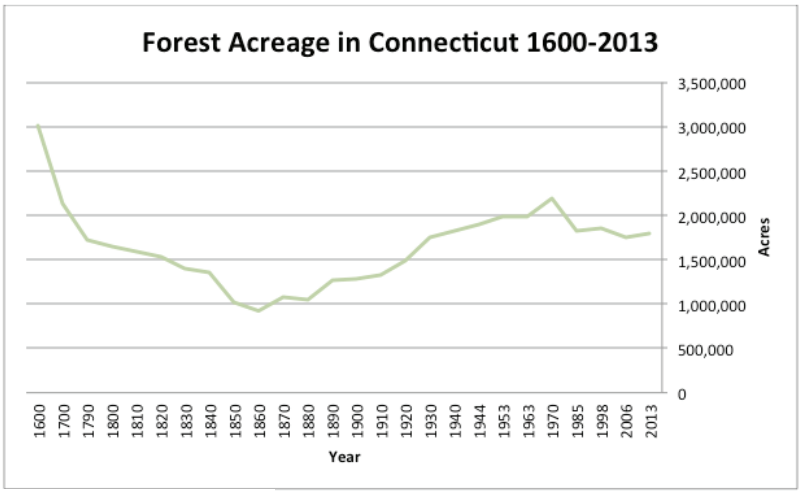
III. The Forest Resource

Forest Area

At over 56% forest cover, Connecticut is the sixteenth most forested state in the country just behind Michigan. The northeast U.S. is the most forested area of the country in terms of percentage of land in forests. Of the 1,799,342 forested acres in Connecticut, 1,755,419 acres, or 97.5% are considered "timberland," meaning these lands are capable of producing repeated timber crops.

A long-term forestland acreage trend analysis coordinated by the Harvard Forest shows that Connecticut's forested area is about a third less than when Europeans first arrived in North America (See Figure 1). It is estimated that in the year 1600 forests covered 3.0 million acres compared to today's 1.8 million. Connecticut's forests have grown back after reaching a low of 923,000 acres in 1860. Since a recent peak in 1970, forest acreage declined approximately 400,000 acres (largely due to conversion to non-forest land uses) but has leveled off in recent years.

Figure 1

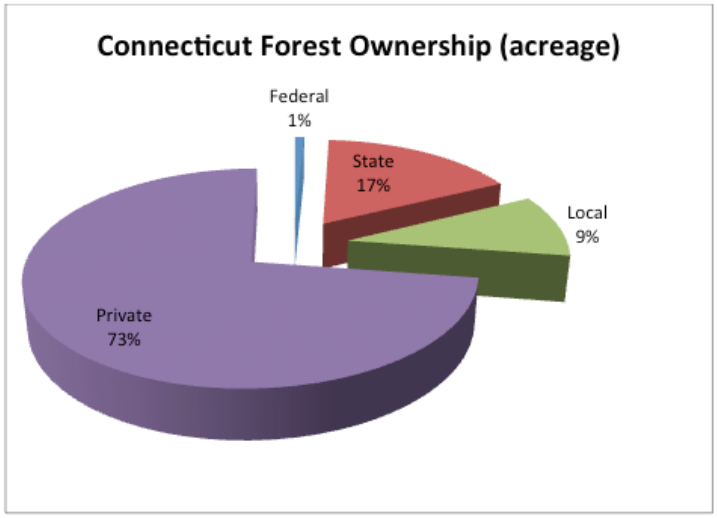


Source: Harvard Forest – multiple data sources

Forest Ownership

The individual/family forest owner sector continues to dominate the ownership of Connecticut's forest. Over 73% of Connecticut's forests, or 1.3 million acres, are owned by individuals or families (Figure 2). Cities, towns and counties own approximately 10% of the forests or approximately 173,000 acres. The State of Connecticut owns 17% or approximately 303,000 acres of Connecticut's forest.

Figure 2

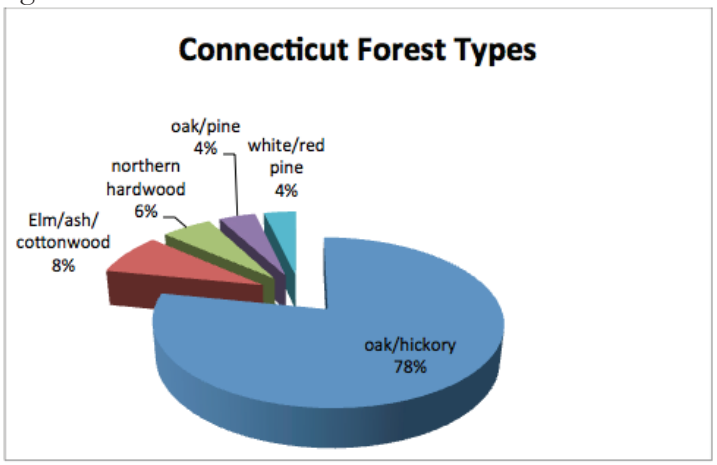


Source: USDA Forest Service, Forest Inventory and Analysis & private data

Forest Types

Connecticut's forests are dominated by oak/hickory - comprising more than 1.3 million acres of the Connecticut woods. Elm/ash/cottonwood forests cover 137,000 acres and northern hardwood (beech, birch, maple) 94,000 acres.

Figure 3



Source: USDA Forest Service, Forest Inventory and Analysis

Timber Volumes

To understand the volume of wood growing in the forests of Connecticut, it is most useful to look at inventory trends over time rather than current volumes. Growth, mortality, harvest levels and loss of forest to non-forest uses determine the overall changes over time. At gross volume levels, Figure 4 shows that standing volume of timber in Connecticut increased approximately 70% from 1985 to 2013. Standing volume is over 96 million tons of wood in trees 5 inches and larger.

From a timber value perspective, it is important to know what is occurring over time with the sawtimber component of the timber inventory in Connecticut since sawtimber products are generally much more valuable than lower quality logs (pulpwood, firewood and logs used for wood energy chips). In Figure 5, we see that the volume of sawtimber trees also increased from 1985 to 2013, in this case, by over 94%.

Figure 4

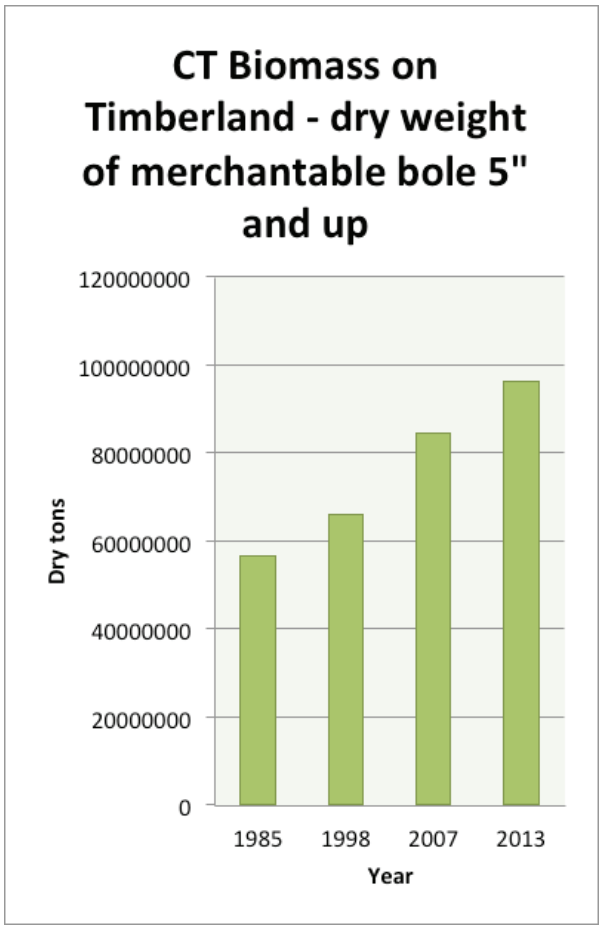
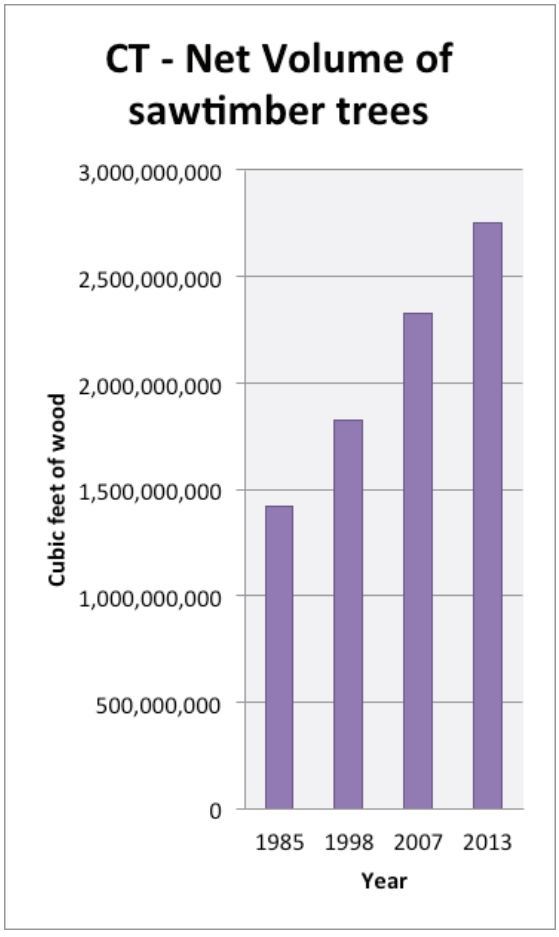


Figure 5



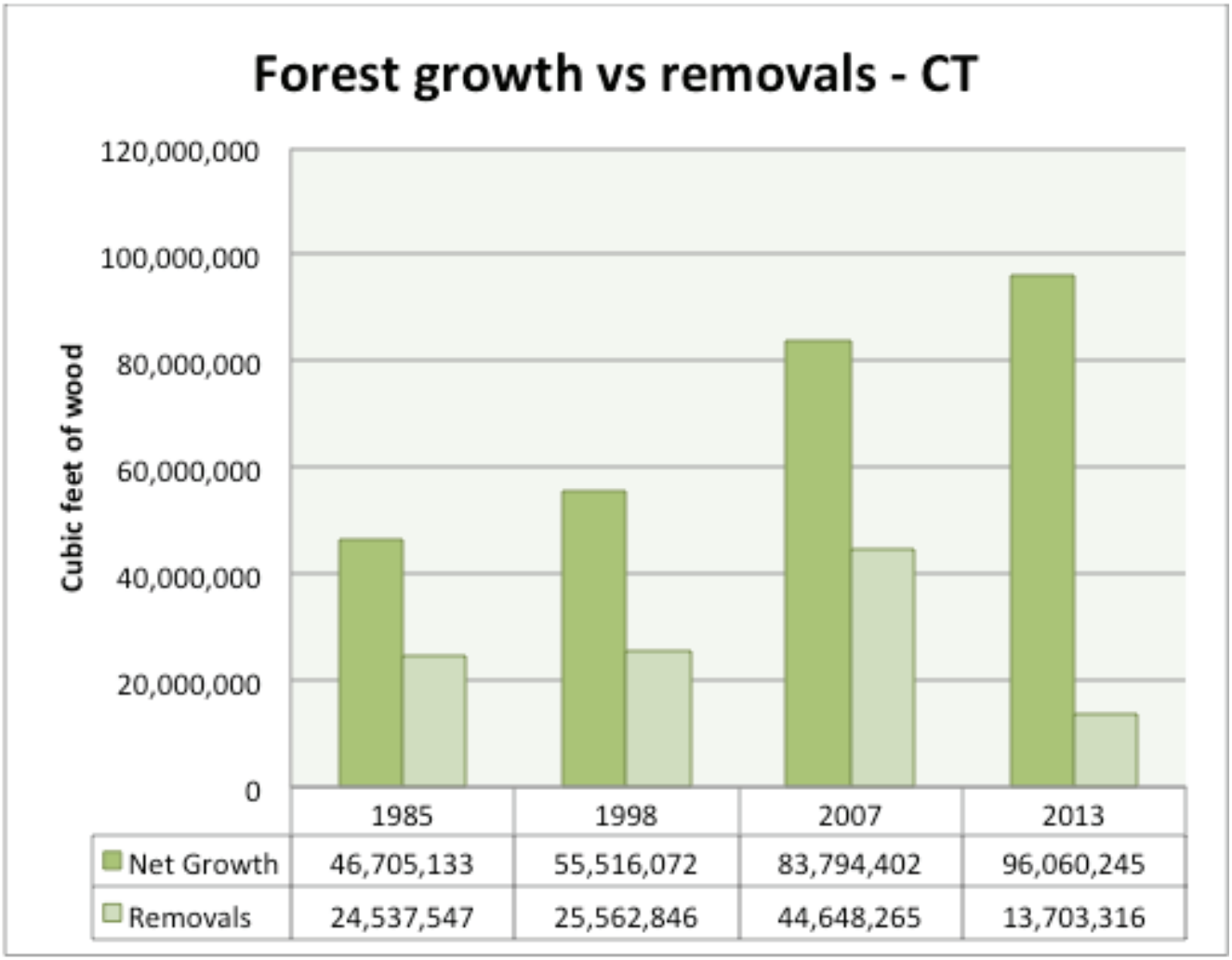
Source: USDA Forest Service, Forest Inventory and Analysis

Sustainability -
Growth, Mortality and Removals from Connecticut's Forests

In terms of volume and value, Connecticut's forest inventory is increasing. To understand this better, we need to look at growth, mortality and tree removals. The USDA Forest Service's Forest Inventory and Analysis (FIA), from which much of the data discussed so far in this report is derived, is the best source for understanding growth, mortality and removals. The FIA data set is derived from a series of fixed, on-the-ground plots that are re-measured, roughly every five years. Each on-the-ground plot represents approximately six-thousand acres and has been providing forest data continuously for over 50 years.

In Figure 6, the current FIA data shows that in Connecticut's forests, annual net growth is 96.1 million cubic feet (3.0 million tons) per year. At the same time, approximately 13.7 million cubic feet of timber is harvested annually. The difference between the net growth and harvests – 82.4 million cubic feet – is the annual extra growth that accounts for the increasing inventory of trees in Connecticut.

Figure 6

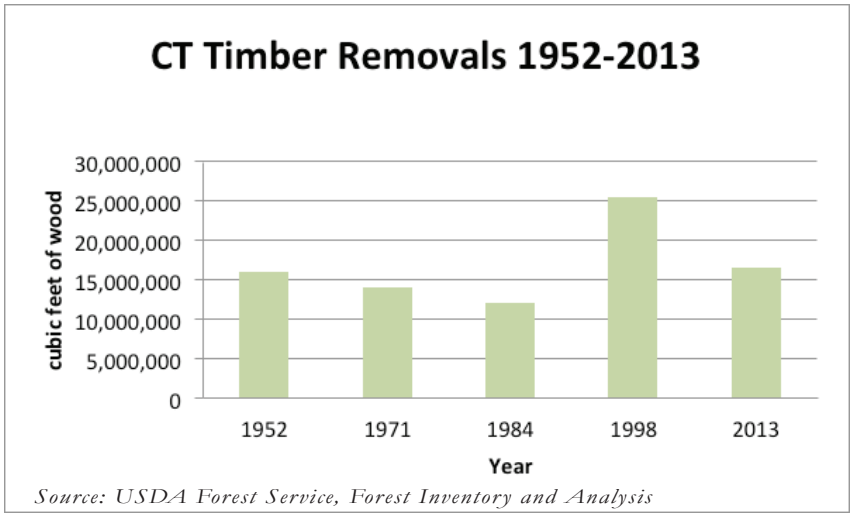


Source: USDA Forest Service, Forest Inventory and Analysis

The difference between forest net growth and harvests is a key measurement for understanding the sustainability of the use of the forest. There are other aspects of forest management, including the factors summarized in a-c below, that further add to understanding the status of forest sustainability in a state.

Timber harvest levels over time, from historical data of the USDA Forest Service indicate significant fluctuations in timber harvesting in Connecticut since the 1950s (Figure 7). An important note in this discussion is that the higher levels of harvesting shown from the 1990s are, most likely in large part, a result of land clearing for development during development booms in the State. These kinds of harvests, for which no accurate records exists, are one-time or "terminal" harvest that results in land changing into a non-forested state.

Figure 7



Source: USDA Forest Service, Forest Inventory and Analysis

a. Certified forestland – In Connecticut, there are over 85,000 acres certified to the American Tree Farm System. In addition to the sustainable harvest levels discussed above, the voluntary standards of the Tree Farm Program cover a full range of requirements covering forestry, ecological, economic, and social issues.

b. Best Management Practices for Water Quality Protection – The biggest impact to forests, aside from their conversion to a non-forest use, is forest harvesting activities. Truck roads, skidder trails, and presence of heavy equipment are integral to forest harvesting operations. Water quality degradation and soil erosion can result if proper procedures are not followed. Connecticut, along with virtually all forested states in the country, has had in place for many years voluntary Best Management Practices for Forestry, commonly called best management practices or BMPs. Use of BMPs on forestry operations has become integrated into most forest operations in the last several decades. The culture in the forest industry has changed in that regard – it is simply no longer acceptable to negatively affect water quality or soils in forest operations.

c. Use of professionally trained and certified foresters and loggers – The use of certified foresters and loggers is integral to assuring sustainable harvesting operations. In Connecticut, all foresters and forest products harvesters (loggers) must be certified by the state in order to be in business. Under the Connecticut Forest Practices Act, passed in 1991, foresters and loggers must complete continuing education training in order to maintain their certification.

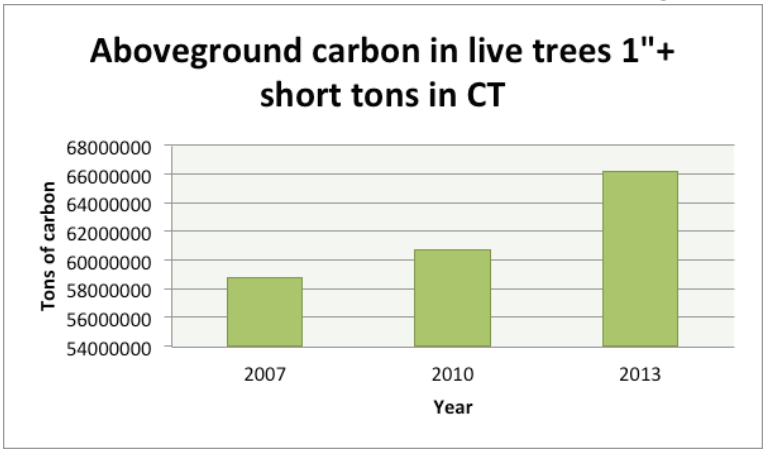
Carbon in Connecticut's Forest

It is well known that trees and forests are an important element of the Earth's carbon equation. Science has shown that carbon dioxide levels are increasing, in part due to emissions associated with human use of fossil fuels in industry and transportation. Most scientists believe that this increase in carbon dioxide and other "greenhouse gases" is the key reason why planetary temperatures, on average, are on the rise. Forests naturally take carbon dioxide out of the atmosphere by the process of photosynthesis, and the by-product emitted to the atmosphere is the oxygen that we breathe.

The result of this natural phenomenon is that as forests grow, and if their inventory of wood increases over time, they act as a positive carbon sink where atmospheric carbon dioxide is sequestered as carbon in the wood of the tree. Forests with increasing volumes and carbon mass can provide a positive benefit in the greenhouse gas equation.

According to FIA data, the carbon in the above-ground portion of trees one-inch in diameter or more has increased in Connecticut over 12% from 2007 to 2013.

Figure 8



Source: USDA Forest Service, Forest Inventory and Analysis

Forest Health

The effects of climate change on the forests of Connecticut remain uncertain. This phenomenon may even increase forest growth, but we simply do not know enough to suggest long-term effects on the trees directly from climate change. There are other significant factors affecting forest health, including insect pests and competition from non-native invasive species.

The three insects of greatest concern today are hemlock woolly adelgid, emerald ash borer and Asian longhorned beetle. At the moment, the Asian longhorned beetle is still in the Worcester, MA area and heroic efforts, at great cost, have been employed to eradicate it. The other two are found in Connecticut, but fortunately, only affect ash species and hemlock. No big losses have occurred yet in Connecticut, but hemlock wooly adelgid is being found throughout the state and emerald ash borer was first found in the state in 2012 and is likely spreading. The entire state is now under a USDA quarantine to limit movement of the pest to uninfected areas outside the state.

Lastly, invasive plants, such as autumn olive, buckthorn, Japanese knotweed, bittersweet and garlic mustard, among others, all appear to be growing in area and reach. As these invaders become more established, forest trees are being affected and in some cases are crowded out by these invasive plants. Climate change and related temperature increases may stimulate growth of valuable trees but it also allows invasive plants to get established and grow faster as well.

IV. Forest-Based Economy – current status and trends

The forest-based economy of Connecticut, one of the oldest industry sectors in the State, includes forest products and forest-based recreation.

Forest products manufacturing includes the forestry, logging, and trucking components in which management, harvesting, and transportation move the raw material from the forest to various markets for processing. From there, primary products are manufactured into solid wood products in sawmills, out-of-state veneer mills, and engineered wood product mills such as oriented strand board plants or particle board manufacturers though neither of these industries is found in Connecticut at this time. These primary products are then used by secondary manufacturers in making finished goods such as furniture, moldings, and turned wood products. Although there are no longer wood pulp mills in Connecticut, there are paper manufacturing plants that obtain pulp material from out-of-state pulp mills – some of which are in the northeast U.S. region. Some of the timber harvested in Connecticut's forests goes to these pulp mills.

Lastly, the growing wood energy sector includes large wood-fired power plants, medium to small sized commercial facilities using wood chips or pellets to create heat and/or electricity, and, at the residential level, homeowners that heat their homes with firewood or wood pellets. Wood from Connecticut trees provides raw material for this growing sector in the region.

Forest-based recreation is a large and growing part of the economy throughout the northeast. Hundreds of thousands of people enjoy Connecticut's forests for camping, hiking, hunting, downhill skiing, cross-country skiing, snowmobiling, wildlife viewing, and fall foliage viewing.

It must be noted that some of the data included in the next sections are from 2014 but most are from 2013 or 2012. Activity and output in the forest products manufacturing sector has seen a big upturn in 2013-14 as the country comes out of the recession and the economy recovers. The data below does not necessarily show this.

Forestry and logging

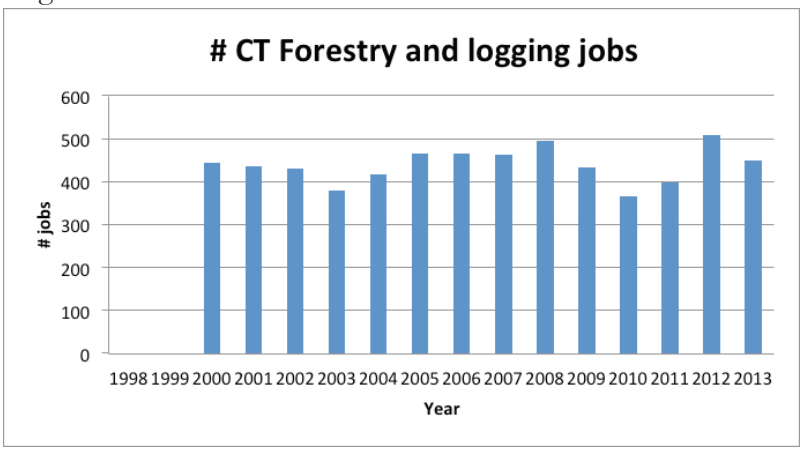
The forestry and logging sectors of the economy move logs, pulpwood, firewood, or chips from the forest to their primary manufacturing market. Employment in this sector is estimated at 450 jobs down from a high of 500 or so in recent years (see Figure 9). Payroll for forestry and logging in Connecticut exceeds $15.1 million annually (Figure 10) and has trended upward since 2010.

Sales in the forestry and logging sectors in Connecticut is approximately $25 million annually (Figure 11).

GDP – Gross Domestic Product includes value added, which is equal to its gross output minus its intermediate purchases from domestic industries or from foreign sources.

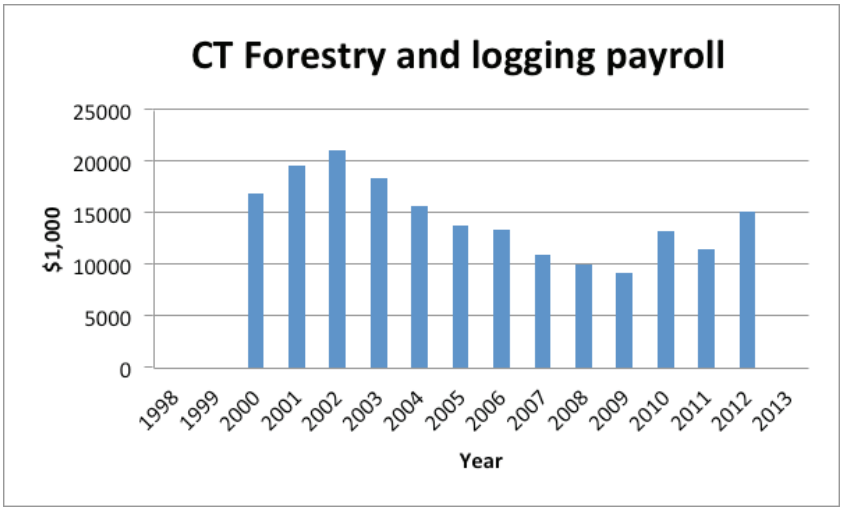
Sales – Value of product shipments

Figure 9



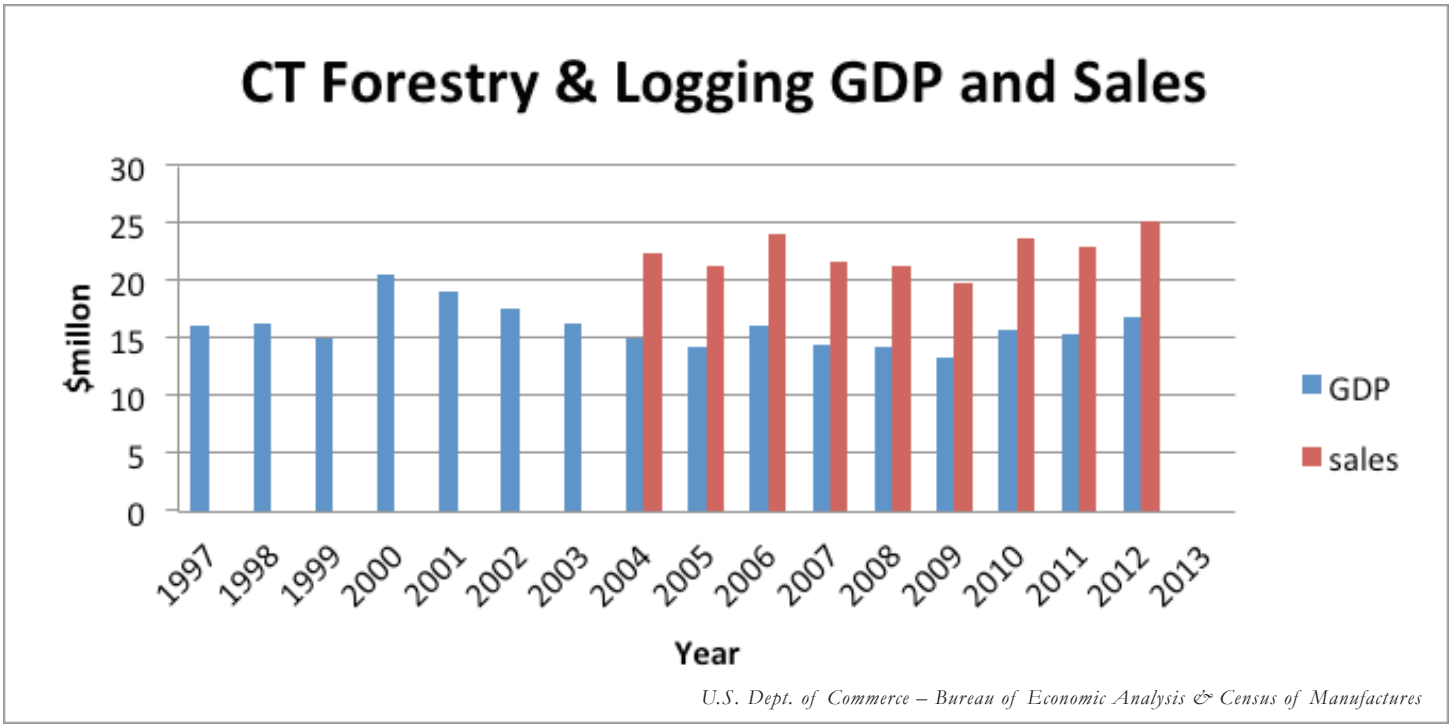
Source: U.S. Census Bureau – Census of Manufactures 2013

Figure 10



Source: U.S. Department of Commerce – Bureau of Economic Analysis

Figure 11



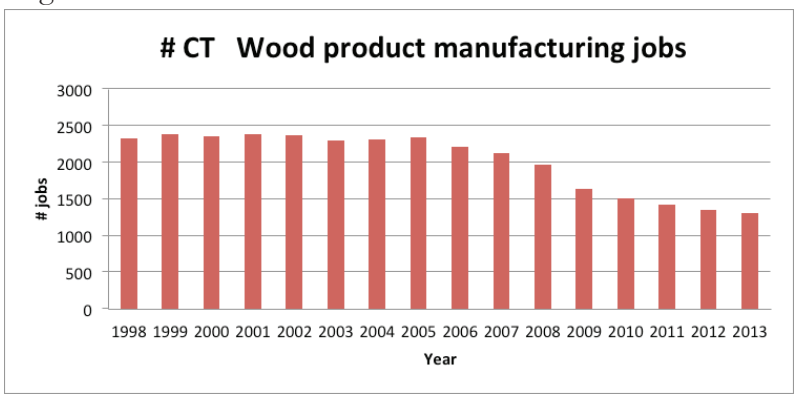
U.S. Dept. of Commerce – Bureau of Economic Analysis & Census of Manufactures

Primary manufacturing – wood products

Makers of lumber and related activities employ 1,300 workers, which is down from a high of approximately 2,300 in the year 2000. Worker productivity has been increasing in this sector as mills automate and institute better manufacturing processes.

Lastly, annual economic output, in the form of annual sales for the wood products sector is approximately $ 150 million in Connecticut.

Figure 12



U.S. Dept. of Commerce – Bureau of Economic Analysis

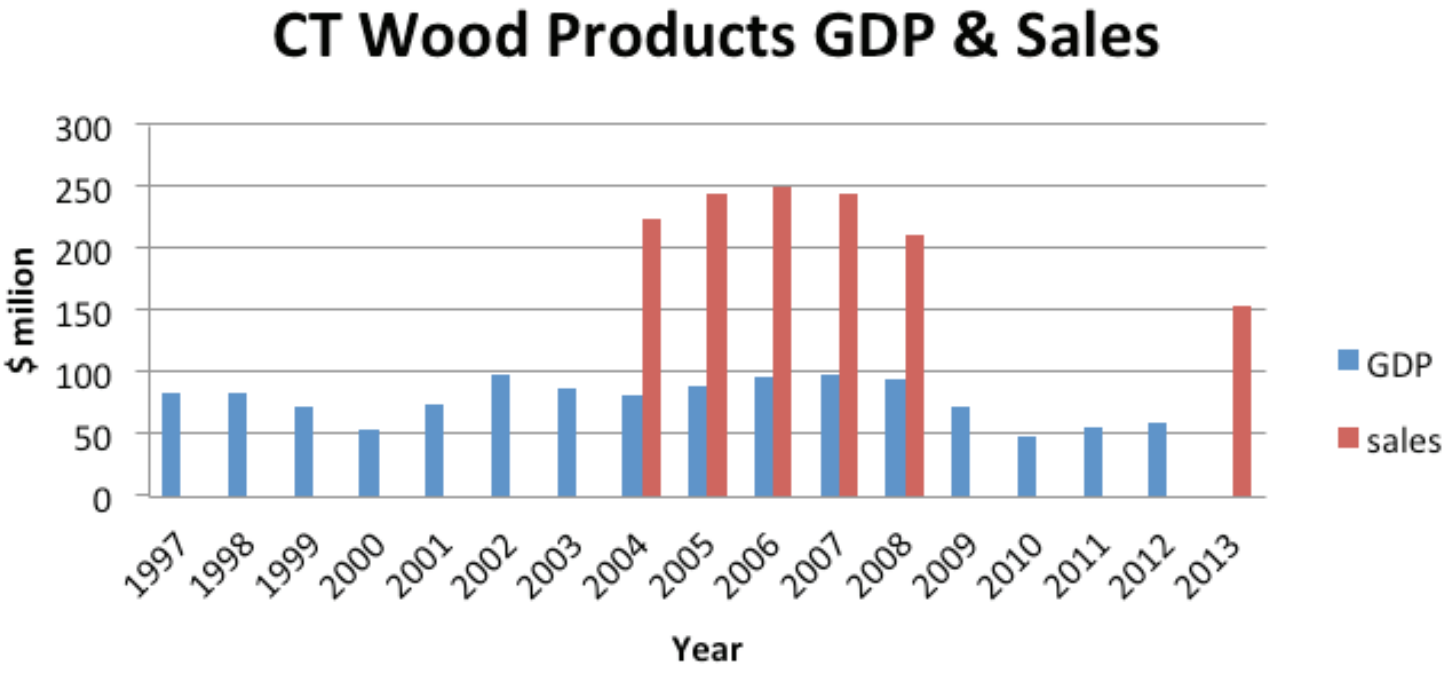
Figure 13

U.S. Dept. of Commerce – Bureau of Economic Analysis

Payroll in the wood products sector is approximately $ 40 million annually. As seen in Figure 13, payroll has decreased since a high of $ 79 million in 2005.

This sector peaked in recent years with sales of nearly $ 250 million in 2006.

Figure 14



U.S. Dept. of Commerce – Bureau of Economic Analysis & Census of Manufactures

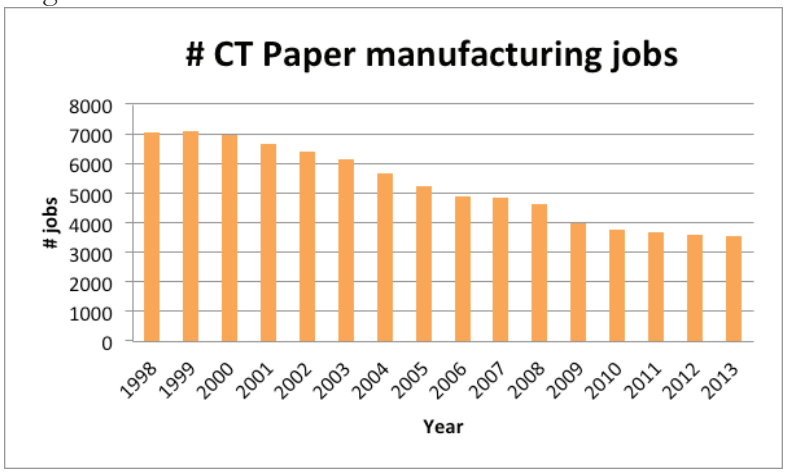
Pulp and paper

Connecticut has no pulp mills but it has paper manufacturing facilities that use pulp as raw material from pulp mills in the region (and elsewhere). As a result, we believe there is a sufficiently direct connection with forests and forestry in the state to include economic information here. The paper making facilities in Connecticut employ over 3,550 workers (Figure 15), down from approximately 7,000 in 1999. Payroll in the paper sector is approximately $ 239 million annually. Payroll has decreased since a high of $378 million in 2003.

While there are no pulp mills in Connecticut, the logging infrastructure annually still harvests pulpwood for pulp mills in New York, Pennsylvania and Maine.

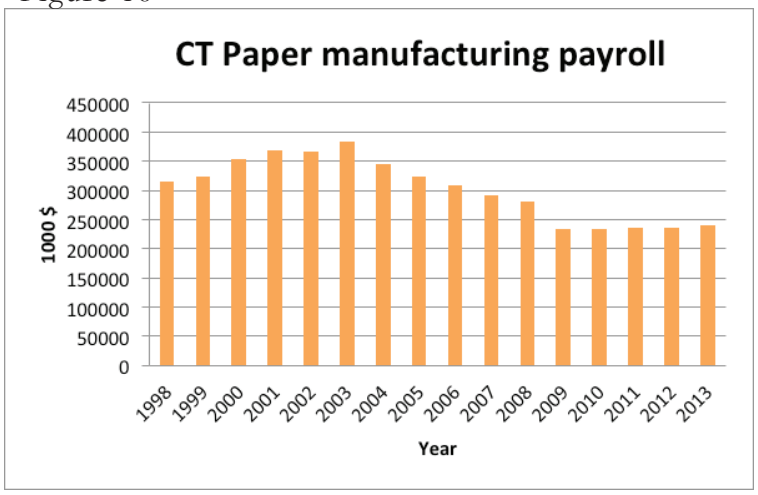
Annual economic output, in the form of sales, is approximately $ 1.6 billion in Connecticut (figure 17).

Figure 15



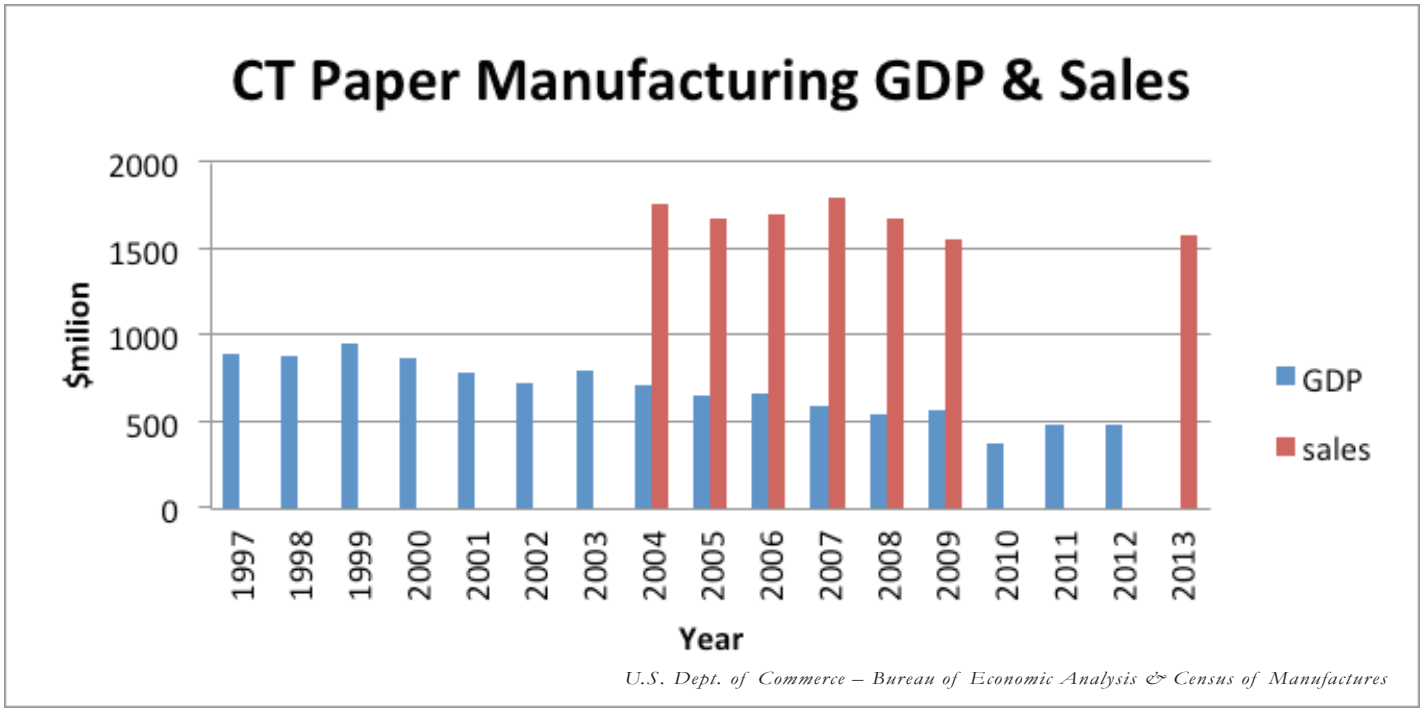
U.S. Dept. of Commerce – Bureau of Economic Analysis

Figure 16



U.S. Dept. of Commerce – Bureau of Economic Analysis

Figure 17

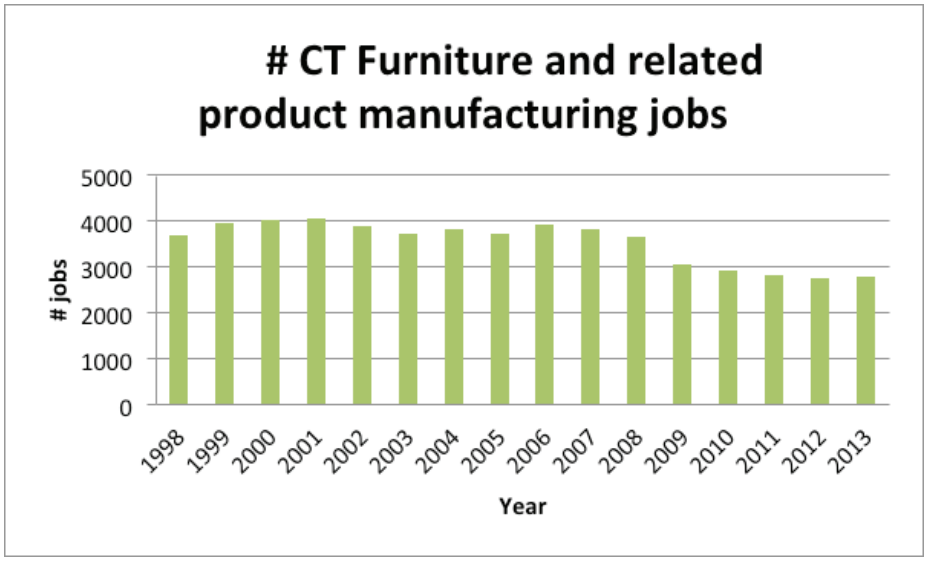


U.S. Dept. of Commerce – Bureau of Economic Analysis & Census of Manufactures

Secondary manufacturing (furniture and related) – wood products

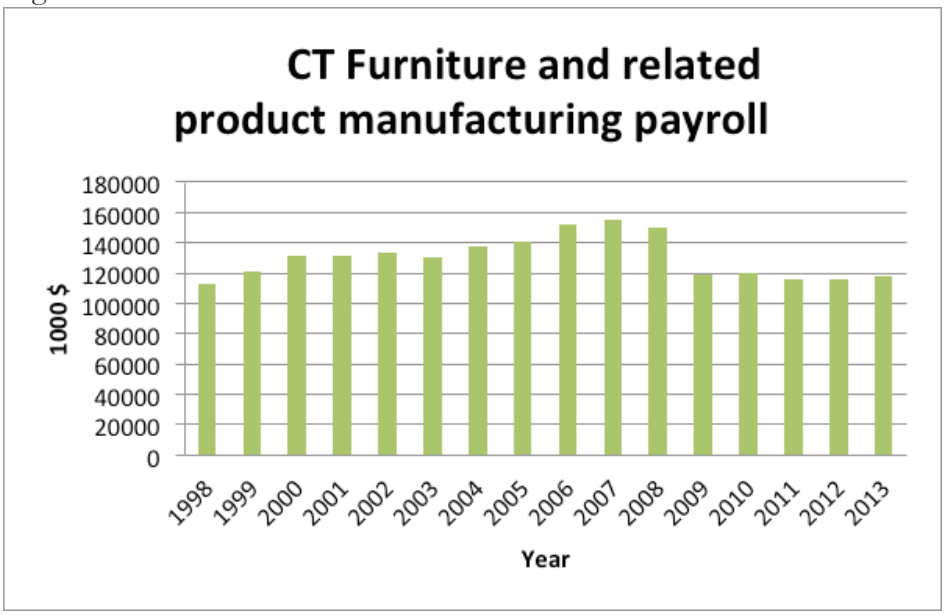
In the secondary wood products manufacturing sector – furniture, cabinetry, flooring, moldings, turnings and all production where the primary solid wood products are transformed into final or parts for final consumer products – Connecticut employs over 2,802 (Figure 18), which is down from a high of approximately 4,000 in 2001. The secondary wood products sector payroll in Connecticut is approximately $118 million annually. It has decreased since a high of $151 million in 2007 but has been steady in the last several years. Lastly, annual economic output, in the form of sales for the secondary wood products sector, is approximately $418 million in Connecticut (Figure 20).

Figure 18



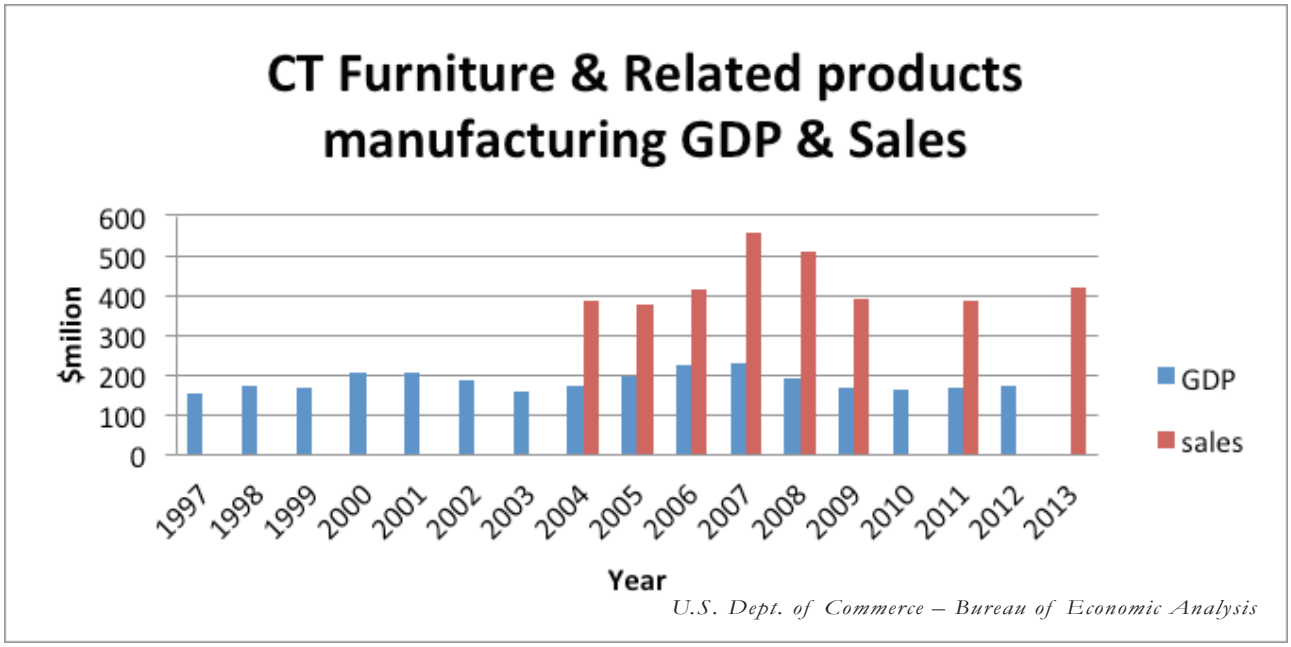
U.S. Dept. of Commerce – Bureau of Economic Analysis

Figure 19



U.S. Dept. of Commerce – Bureau of Economic Analysis

Figure 20



U.S. Dept. of Commerce – Bureau of Economic Analysis

Wood Energy

Wood energy has gain increased attention at the national level and in the northeast in recent years. Many Connecticut homes use wood as a primary or supplemental form of heating, and community-scale biomass applications, such as heating schools with wood boilers, have begun to take hold. Connecticut has over 10 commercial/institutional building owners that use wood fuel as their heating source and more are exploring this option as an alternative to fossil heating fuels.

At the residential level, according to the U.S. Census Bureau's American Community Survey in 2012, Connecticut experienced a 120% increase in the number of homes heating with wood as its main heating source from 2005-2012 (Figure 21). The survey indicated that over 29,000 homes, or 2%, use wood to heat – either firewood or pellets.

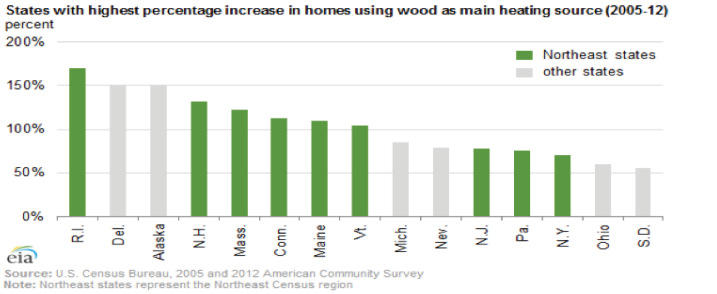
From state and other sources, annual wood fuel use – among residential, medium scale (businesses, schools etc) and large scale users – is estimated to be 153,000 cords of wood each year in Connecticut for heating and electricity generation purposes.

With respect to industrial scale wood energy, Connecticut has a 37.5 megawatt large scale wood biomass fueled power plant in Plainfield. It uses a mix of recycled wood and wood from trees.

Wood biomass is a locally sourced fuel, and - unlike most other energy sources used in Connecticut – benefits the local economy through jobs in the harvesting, processing, and use of wood. Switching to biomass from fossil fuels often results in emissions reductions, depending upon the application and the fuel being replaced or offset. Biomass fuel is made from low-grade wood that is generally not suited for higher value markets and products. Markets for low-grade wood provide landowners and land managers options and opportunities for practicing forestry. In many applications, biomass is cost competitive, and can provide consumers with an opportunity to save money, use a renewable fuel, and support the local economy. In today's economy, homeowners who switch from using fuel oil to wood pellets can save up to 25% on their heating fuel bill. When fuel oil prices were higher in 2013 (and likely to be again in the future), the savings were approximately 50%.

Figure 21

Increase in wood as main source of household heating most notable in the Northeast

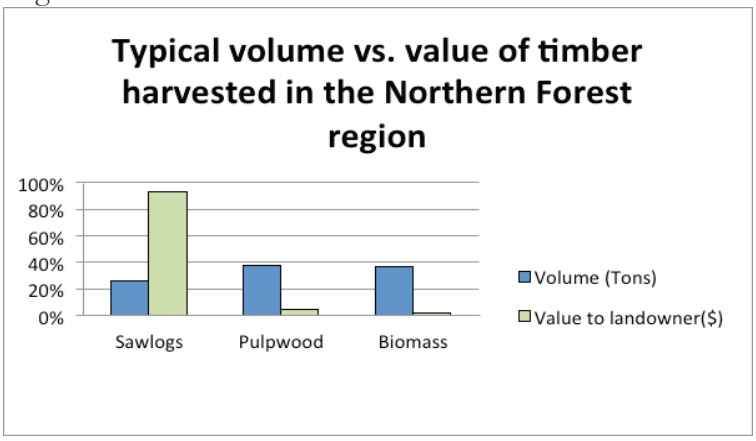


People sometimes question whether wood use for energy can be sustainable in Connecticut. Overall, as shown in Figure 6, Connecticut is harvesting far less than the forest is growing, which allows for the inventory of trees to increase over time. Further, Connecticut uses a lot of wood for firewood from urban tree removal – wood that would otherwise be dumped in landfills – so this further reinforces the fact that Connecticut is harvesting its forests sustainably.

The value to the forest landowner from harvesting trees for wood energy is very low relative to other products such as sawlogs that go to a mill to be processed into boards. Figure 22 shows that the economics of wood energy products make it unattractive for landowners to harvest only biomass since its value is too low. Today, a typical forest landowner in the northeastern U.S. will receive only $1-2 per ton of biomass chips harvested or $10-15 per cord of firewood. Nor do loggers profit much from selling biomass. A logging company most often harvests a full suite of products – from sawlogs to pulpwood to firewood and biomass chips – allowing them to cover their costs and make a small profit on the overall harvest. Typically, they cannot survive on harvesting biomass chips alone. Landowners harvest lower value products to improve the quality of the remaining trees in order to reap larger returns in the future when the higher value trees grow to maturity.

Regardless of the kind of harvest, loggers have adopted best management practices to protect water quality, and practitioners in Connecticut are regulated to help ensure the sustainability of the harvesting of Connecticut's forest lands.

Figure 22



Most of the energy wood harvested in Connecticut stays in Connecticut or in the immediate region. The value of the wood, which is low relative to its volume and weight, usually makes it cost prohibitive to ship very far from where it is harvested. Some wood pellet mills in the southern U.S. are exporting pellets to Europe, but that is not occurring yet in the northeast U.S. and may not since there is strong local demand for pellets.

Christmas trees and maple syrup

The Christmas tree and maple syrup industries are small but well-recognized as important to the local economy in Connecticut. In 2014, the wholesale and retail sale of maple syrup and related products in Connecticut totaled over $720,000 while Christmas tree sales were approximately $3.6 million. It is estimated that there are over 50 establishments in the maple syrup sector and another 65 in the Christmas tree sector in Connecticut.

Conclusion on Forest Products Economy

The forest products trend data shown elsewhere in this report clearly show a smaller, more efficient forest products industry exists today compared to 15 or 20 years ago just as the other manufacturing sectors in our U.S. economy have changed during this period. Despite that, there is still a significant forest products economy in Connecticut. During that time period, however, the volume of timber removals from Connecticut's forest has stayed relatively stable from approximately 15,000,000 cubic feet in 1952 to just over 15,000,000 cubic feet in 2013, with the latter year still part of the recession period (Figure 7).

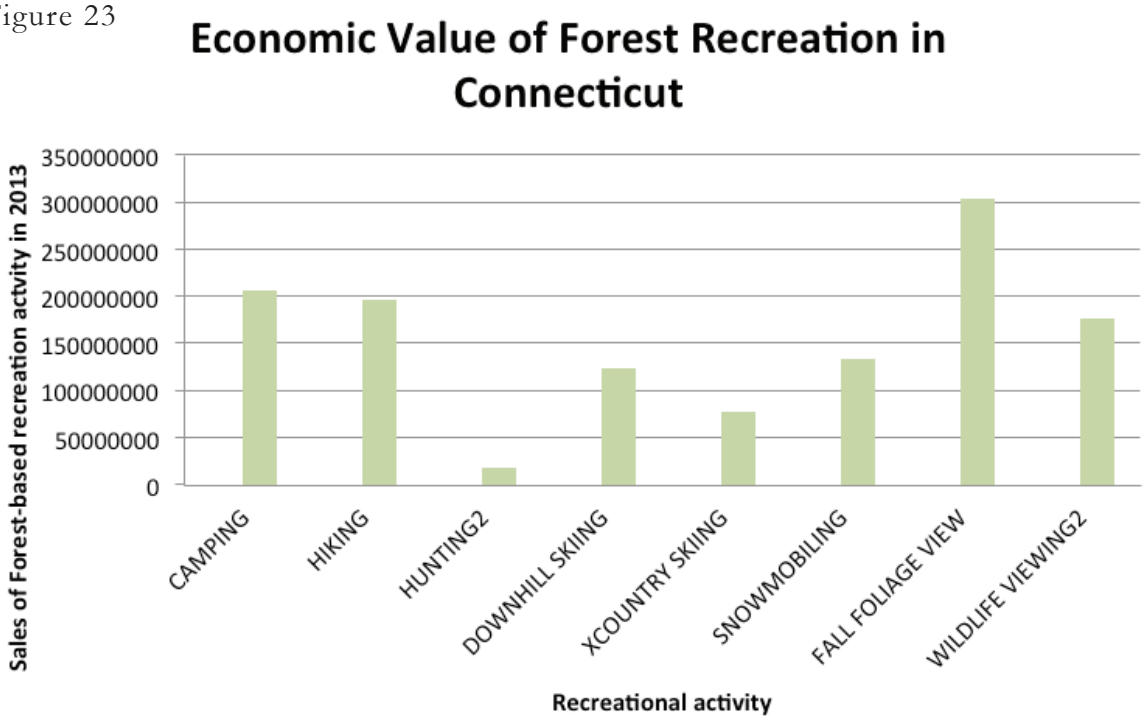
Forest-based Recreation/ Tourism

Despite its high population density, forests dominate Connecticut's landscape. Thus, a large percentage of recreation and tourism activities in Connecticut are linked to the forest. Still, it is challenging to estimate the specific contribution made by the forest environment to recreation and tourism expenditures. Some activities take place primarily in the forest environment, including camping, hiking, hunting, downhill skiing, cross-country skiing, snowmobiling, fall foliage viewing, and wildlife viewing. In this analysis, we assume that 75% of the value of these activities is directly attributable to the existence of forests of Connecticut. For fall foliage viewing, we assume a percentage of 100%. The method used for the forest recreation sector in the federal agency research used for this section (USDA Forest Service and U.S. Fish & Wildlife Service) is a multiplier-like approach so that a dollar spent on forest-based recreation in Connecticut ripples through the economy of jobs and income to many support industries to recreation.

The key data source for the economic value of forest recreation is the National Survey on Recreation and the Environment from the USDA Forest Service. Additionally, we have used results from the new National Survey of Fishing, Hunting, and Wildlife-Associated Recreation conducted most recently in 2011 by the U.S. Fish and Wildlife Service of the federal Department of Interior. These 2011 data have been updated to 2013 using the Consumer Price Index.

The forest-based recreational activities listed above contribute $ 1.2 billion in sales annually to the Connecticut economy. These are distributed among purchases at food and beverage stores, service stations, lodging places, eating and drinking establishments, and a host of other retail trade or service sectors. Fall foliage viewing is the largest contributor with 25% of the total sales, and is followed by, in order, camping, hiking, wildlife viewing, snowmobiling and downhill skiing (Figure 23).

Figure 23



About 4,600 people are employed in forest-based recreation and tourism sectors with payrolls of $122 million annually.

Jobs	Payroll
4,600	$121,997,984

Sources: Multiple sources including National Survey on Recreation and the Environment from the USDA Forest Service and National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. Analysis by Dr. Hugh Canham

Value of Ecosystem Services

The purpose of this publication is to show the economic value of the forest-related economy in Connecticut. The data provided shows those parts of the goods and services provided by Connecticut's forests that can be measured and, generally, have a monetary value placed on it within the economy. Other goods and services from Connecticut's forests are not so readily measured in dollars and cents, especially the natural assets sometimes referred to as "ecosystem services". Forest ecosystems are ecological life-support systems that provide a full suite of goods and services that are vital to human health and livelihood. They include wildlife habitat and biological diversity, clean air, clean water and watershed services, scenic landscapes, and carbon storage, which we discuss briefly but on which we did not place a monetary value.

Carbon in forests and, more accurately, a tree's ability to sequester carbon from carbon dioxide in the air into wood through photosynthesis is now taking on monetary value for some forest owners through the California greenhouse gas regulatory process. Prices being paid in 2014 range from $10 to $12 per ton of carbon sequestered but prices in this infant market can fluctuate widely. A rough average of carbon being sequestered in Connecticut's forest that can be monetized in these new markets is likely between 0.5 ton and 1.5 tons of carbon per acre per year, depending on the age, forest type and stocking of the forest, among other factors. Though modest, it may be the start of converting valuable ecosystem services to market-based assets. Regardless, ecosystem services not yet monetized should be considered a valuable part of the forest-based economy in Connecticut.

Connecticut Division of Forestry

The Connecticut Division of Forestry within the Department of Energy and Environmental Protection can be reached at 860-424-3630.

Programs within the Division of Forestry focus on working with partners to protect Connecticut's forest resources. These programs:

- encourage private land owners to practice responsible long-term forest management (private landowners own nearly 85% of Connecticut's forest),
- protect Connecticut's forest resources from the effects of fire, insects, disease, and misuse,
- provide accurate and timely information about Connecticut's forest resources
- certify forest practitioners,
- manage the State Forests, in which exist many large blocks of unfragmented forest land, and
- encourage local forest industry.

The National Association of State Foresters, a non-profit organization that is made up of the individuals who head the state forestry agencies in the U.S, periodically reviews information about the state agencies that oversee forestry in their respective state. The most recent report on this topic is "NASF State Forestry Statistics Benchmarks - Fiscal Year 2012" and can be found at http://www.stateforesters.org website under publications.

Issues with potential to affect the future forest-based economy in Connecticut

There are a number of issues that could affect the future forest-based economy in Connecticut.

- Land removed from active management – If significant acreages of forestland are removed from the working forest, those acres may still provide the backdrop for the forest recreation/tourism part of the economy but will no longer also provide the raw material for the forest products manufacturing sectors of the economy. This can also occur when forest land is fragmented by development.
- Climate change – In the short-term, slightly longer growing seasons resulting from shortened winters and slightly warmer temperatures, given all other things being equal, may increase the growth of Connecticut's trees and provide for slightly longer warm weather periods each year for recreation in the woods. Shortened winters may have negative effects on that portion of the recreation economy. This phenomenon may benefit parts of the forest-based economy. Should climate change also result in increased forest pest problems and reduce overall annual rainfall (or result in other changes), the perceived benefits could be offset. Over the long-term, any positive effects from climate change could disappear should temperature increases and climate changes not modify over time.
- Loss of markets – For the forest products sector from the woods to the mill, robust market opportunities are extremely important. The trend data shown in this report depicts a smaller overall forest products manufacturing industry than 20 years ago with trends suggesting continued contraction. The positive sign is that the industry is producing more product per worker than ever before and diversifying markets which are located within and near Connecticut in the northeast region. The wood energy sector continues to grow, particularly for thermal installations in homes, schools etc.
- Loss of tree species – As with the changes brought on in the forest economy when american chestnut dropped out of the forest due to the chestnut blight in the 20th century, new pathogens and invasives may do the same for species like ash and hemlock, with unknown effects.
- Reduced federal and state support for forestry assistance programs – Certain forest activities, chiefly forest management by the tens of thousands of private forest owners in Connecticut, have been subsidized, in part, by the federal government in the form of cost-share payments for management plans and a variety of forest management activities. The Connecticut Division of Forestry staffing levels are also being affected by state budget issues as with other sectors. It is expected, in these times of reducing federal budgets in discretionary spending, that cost-share opportunities for forest stewardship will dwindle, resulting in less forest improvement work on the ground for that subset of the forest owner population that has taken advantage of the financial assistance.
- Federal and state tax and other policies – Business owners in the forest products and forest recreation sectors in Connecticut have long said that stable public policies are important for business. Changing policies, however well-meaning they might be, make for a challenging business environment.
- Cost of travel – A large portion of the forest-based recreation economy in Connecticut is based on individuals traveling from other locations and within to visit Connecticut and enjoy the beauty of this heavily forested state. The price of transportation fuels is a key factor in whether tourists decide to travel to Connecticut. Recent drops in transportation fuels will have positive effects on forest recreation spending. As transportation fuels increase in the future – as they no doubt will, recreation in the forest, at least for visitors from elsewhere, may be reduced.

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This booklet is part of a series on the economic importance and value of forest-based manufacturing and forest-related recreation and tourism sectors in the northeastern states of Maine, New Hampshire, Vermont, New York, Massachusetts, Connecticut and Rhode Island produced by the North East *State* Foresters Association (NEFA). Past reports can be viewed at www.nefainfo.org

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