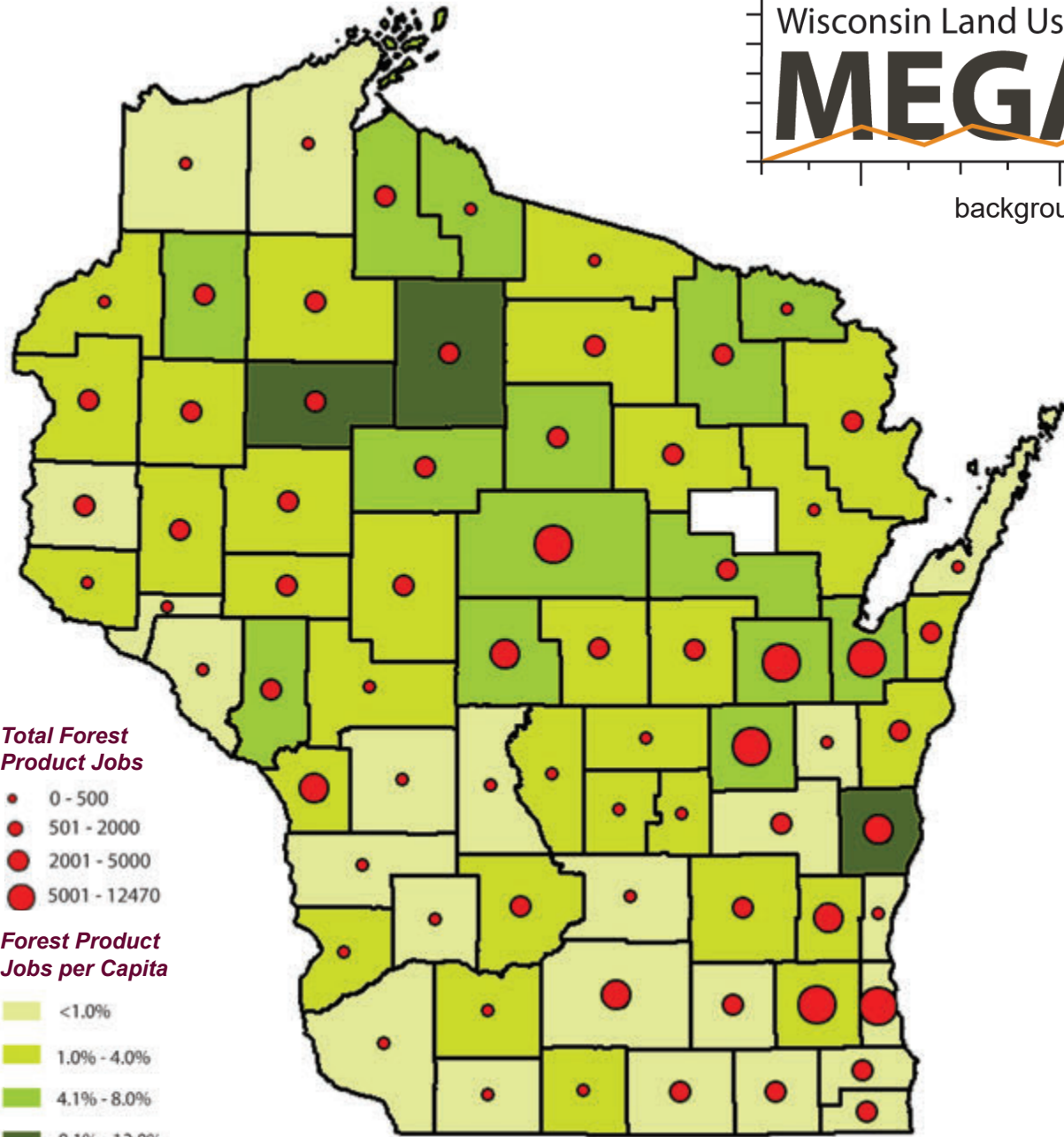
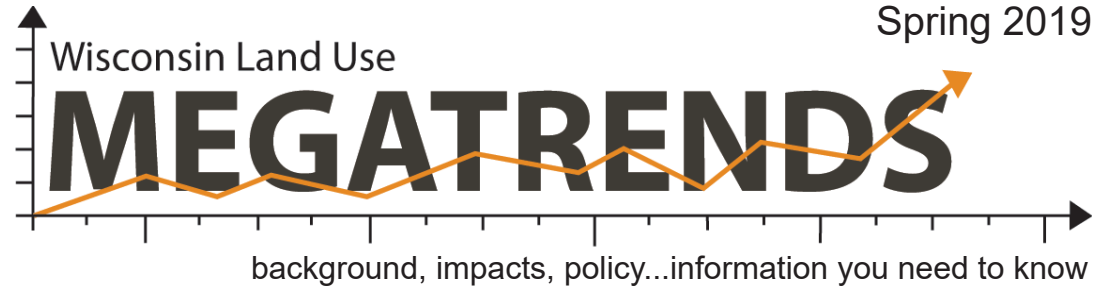


Spring 2019



Total Forest Product Jobs

- 0 - 500
- 501 - 2000
- 2001 - 5000
- 5001 - 12470

Forest Product Jobs per Capita

- <1.0%
- 1.0% - 4.0%
- 4.1% - 8.0%
- 8.1% - 12.0%

Find Your County

What role do forestry related jobs play in your county?

FORESTS

Introduction

Forests have played a large role in the physical and economic development of Wisconsin. Natural and human forces also have shaped Wisconsin's forests. This report provides a brief history of Wisconsin's forests and reflects on the social, economic and environmental costs, benefits and challenges facing our forests. Policy and management options for landowners, local officials and communities looking to support our forests are also provided.

History of Wisconsin Forests

Glaciers receded from northern Wisconsin roughly 12,000 years ago. Early forest communities were short-lived and changed with natural forces such as climate change, natural succession, and disturbance by wind, fire, disease and insects.¹¹ Native Americans also shaped the landscape through practices such as hunting, foraging, burning, clear cutting, selective logging, planting, and dam building.¹¹ When Europeans first arrived in Wisconsin in the 1600s, they found vast areas of hardwoods and conifers in the north, and patches of hardwoods interspersed with grassland, savanna, and open wet meadow in the south.¹¹

Federal land surveys began in 1832 opening the state to development. As the nation expanded, so did the

Cover: Wisconsin Forest-Related Jobs

The cover map shows total forest product jobs per county and per capita. The greatest number of forest-related jobs are located in metropolitan counties surrounding Green Bay, Appleton, Milwaukee and Wausau. The highest number of jobs per capita are located in Price, Rusk and Sheboygan counties. Forest product jobs include forestry and logging, wood product manufacturing, pulp and paper manufacturing, printing and related support activities, manufacturing of sawmill, woodworking, and paper machinery, and biomass electric power generation. Data is not available for Menominee County.^{C1}

demand for lumber. The location of early mills led to the growth of cities and towns and influenced railroad routes.¹² By the early 1900s, Wisconsin was a premiere logging state. Early harvesting efforts focused on pines and selecting only the most suitable and profitable timber. This changed as demand for the state's furniture, paper, and tanning industries grew. Timber companies grew larger, land holdings consolidated, and harvest patterns changed. Timber companies shifted their focus from pines to hardwoods and began to clear forests of almost all usable trees.¹² Facing a dwindling resource supply and growing competition from the Pacific Northwest, logging soon began to decline. The period of intense timber harvest, known as the Cutover, lasted from roughly 1880-1920.

As logging declined, many communities struggled to cope. The state attempted to attract new immigrants by promoting agricultural development across northern Wisconsin. Due to economic and environmental constraints, many of these attempts failed. By 1927, an estimated 2.5 million acres or one-quarter of the land in Wisconsin's 17 northern counties became tax delinquent.¹³ Communities that managed to survive prospered as retail and distribution centers or as paper manufacturers.¹²

Early conservation efforts, including a comprehensive forestry law in 1904 and attempts to establish state forest preserves were met with mixed success. It was not until the late 1920s that federal and state efforts aligned to make progress on conservation and reforestation.¹⁴ Tax delinquent lands became the basis for our county, state and national forest system.¹³ Following World War II, the Northwoods experienced an economic revival through forest recovery and tourism.¹² Today, the state supports a wide variety of healthy forest ecosystems. New challenges also face Wisconsin forests, including environmental issues, economic demands, and changing expectations among people who own and manage forests.¹⁴

Forest History Timeline



Early 1800's

Fur trading and lead mining attract settlement to Wisconsin Territory

1809

First sawmill on Fox River in DePere

1830's

Small scale logging near Portage, Prairie du Chien, and Green Bay

1840's

Major logging along the Black, Chippewa, and Wisconsin Rivers

1848

Wisconsin becomes 30th state

1880

Logging dominates Wisconsin's industrial economy for 30 years

Early 1900's

Clear cutting, over harvesting and fires decimate Wisconsin forests

1904

Wisconsin adopts comprehensive forestry law and hires state forester

1915

Wisconsin Supreme Court blocks state forestry programs

1924

Constitutional amendment allows acquisition, development and preservation of state forests

1927

Forest Crop Law (FCL) established

1928

First school forest in Laona

Forest Resources

Wisconsin is home to 17.1 million acres of forest land.¹⁵ By area, forests cover nearly half of the state. Figures I1 and I2 show the current extent of forests and forested wetlands by county.¹⁶ Most forests are located in northern, western and central Wisconsin. In contrast, agricultural land and urban development predominate across southern and eastern Wisconsin, where urban forests are the norm.

There are roughly nineteen different forest types in Wisconsin. Oak-Hickory is most common and covers 4.4 million acres in western Wisconsin. Maple-Beech-Birch and Aspen-Birch are also common, covering 3.9 and 3.0 million acres in northern Wisconsin. Together, these three forest types make up two-thirds of all Wisconsin forests.¹⁵

Wisconsin forests can be divided into two broad categories based on climate and soil: the Northern Mixed Forest and the Southern Broadleaf Forest. The area between these two ecological zones is called the Tension Zone and contains a diverse mix of species from both the north and south.¹⁴ The Tension Zone snakes across the state from an area just north of the Twin Cities in northwest Wisconsin to Milwaukee in southeast Wisconsin. Scientists have been closely watching this area to see how forest species react to changes in land use and a warming climate. This area has been slowly and steadily moving north.¹⁷

Figure I1
Percent Forest Cover¹⁶

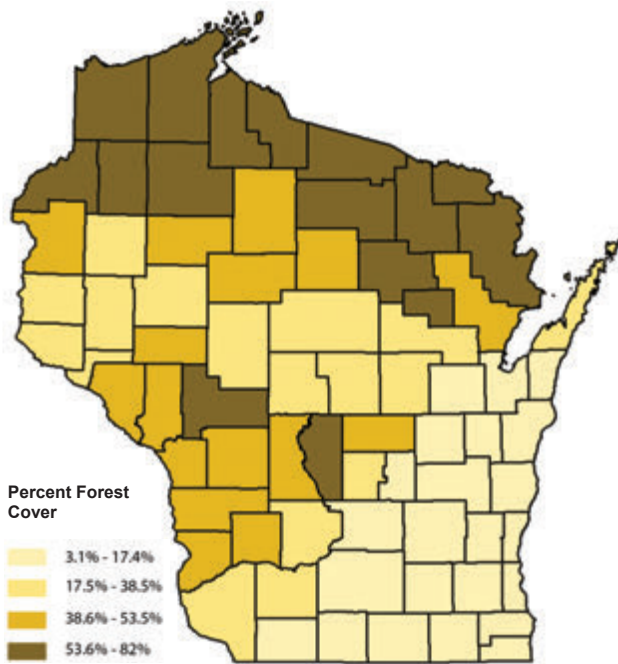
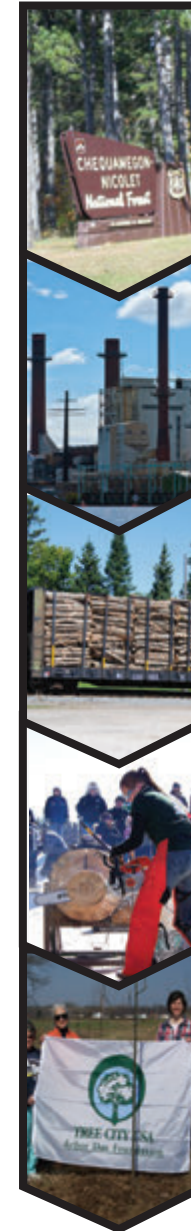
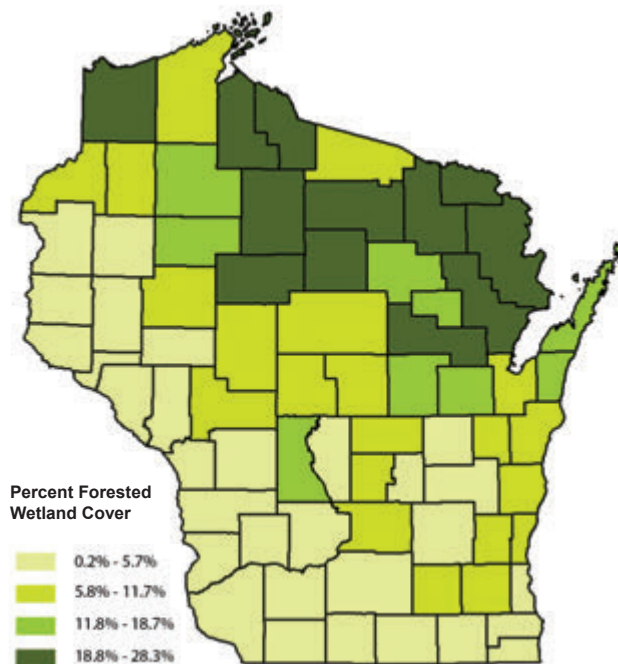


Figure I2
Percent Forested Wetland Cover¹⁶

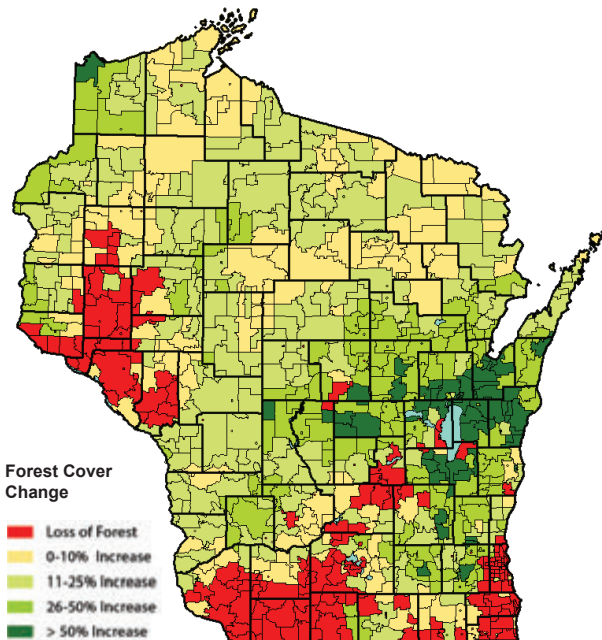


- 1929
State law allows counties to take title to tax delinquent land, establish county forests, and zone for forestry
- 1933
Chequamegon and Nicolet National Forests established from 1933 - 1942
- The Civilian Conservation Corps plant millions of trees in Wisconsin
- 1950
Forests and lakes fuel tourism and recreation
- 1953
Wisconsin becomes number one paper-making state in the nation
- 1960
Lumberjack World Championships held annually in Hayward
- 1960's - 1970's
Dutch Elm Disease decimates urban forests giving rise to urban forestry profession
- 1978
Sheboygan is first Wisconsin Tree City USA
- 2001
K-12 Forestry Education Program (LEAF) established
- 2013
School forests in every county
- 2016
Wisconsin has 193 Tree City USA communities, 96 community forests and 247 school forests

See references for photo credits

The age, composition and distribution of Wisconsin's forests is constantly changing. Since the Cutover Period of the early 1900s, forest cover has increased dramatically throughout central and northern Wisconsin. As shown in Figure 13, recent gains are most heavily concentrated in northeast Wisconsin.¹⁸ Continued efforts at the state, county and local level to manage forests have resulted in regeneration of forests and conversion of marginal agricultural land to forests.¹⁴ Loss of forest land is most dramatic in southeast, southwest and western Wisconsin. Contributing factors include economic decline, sale of industrial forestland, conversion of forests to other uses, changes in federal cost-share and tax programs, and changes in landowner management strategies.¹⁹

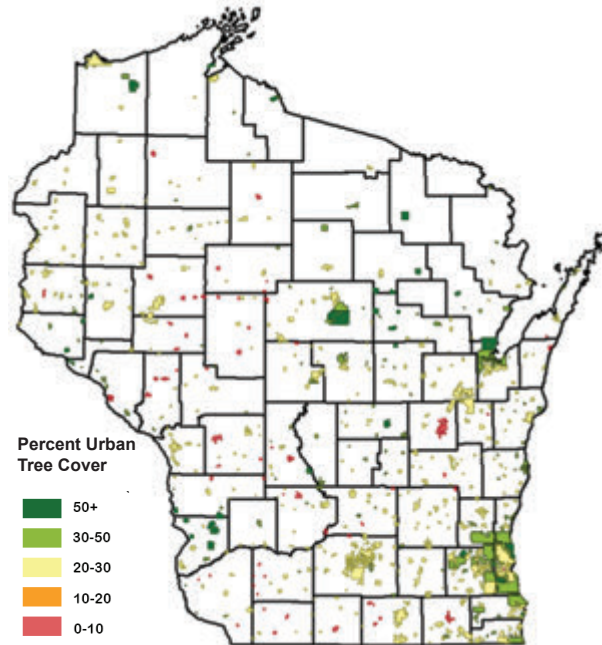
Figure 13
Net Forest Cover Change, 1992 - 2015¹⁸



Urban Forests

Though much is known about rural forests, we are just beginning to understand the urban forest. Urban forests include all publicly and privately-owned trees within an urban area. This includes trees located within yards, along streets and river corridors, in parks, cemeteries and school grounds, on undeveloped land and abandoned industrial sites, and in stands of remnant forest. Since 1930, the USDA has been monitoring and tracking the health of large forest plots through its Forest Inventory and Analysis program. Stands of trees that are less than one acre in size or that are used predominantly for urban or agricultural uses are not included in these efforts.¹⁰ Figure 14 provides a snapshot of urban tree cover in Wisconsin's municipalities.

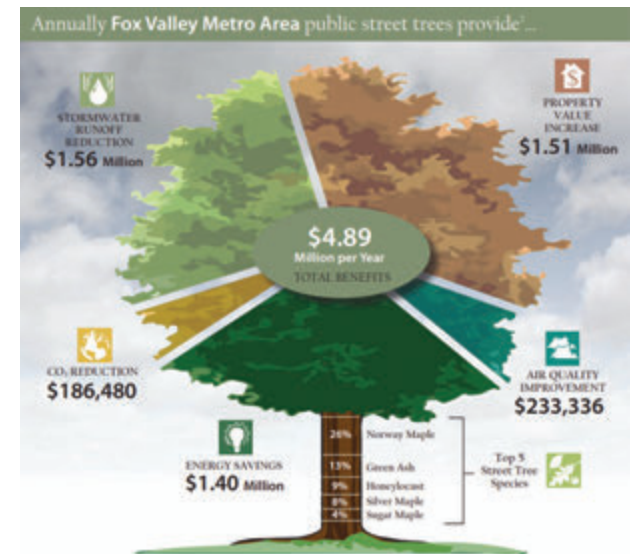
Figure 14
Percent Urban Tree Cover in Municipal Areas¹¹¹



Facts about Wisconsin's Urban Forest^{111, 112}

- There are 42.8 million trees in urban areas.
- Residential areas contain the majority of urban trees (69%) and have the greatest tree density of 69 trees per acre).
- Wisconsin municipalities have an average tree canopy of 29%.
- Ozaukee County has the highest tree canopy in the state at 45%.
- Wisconsin's urban trees have a replacement value of \$19.3 billion.
- Urban trees provide annual energy savings of \$79 million, remove \$47 million worth of air pollution, and store \$507 million worth of carbon.

Figure 15
The US Forest Service provides software called iTree Landscape to help communities measure and quantify the benefits of the urban forest.¹¹³

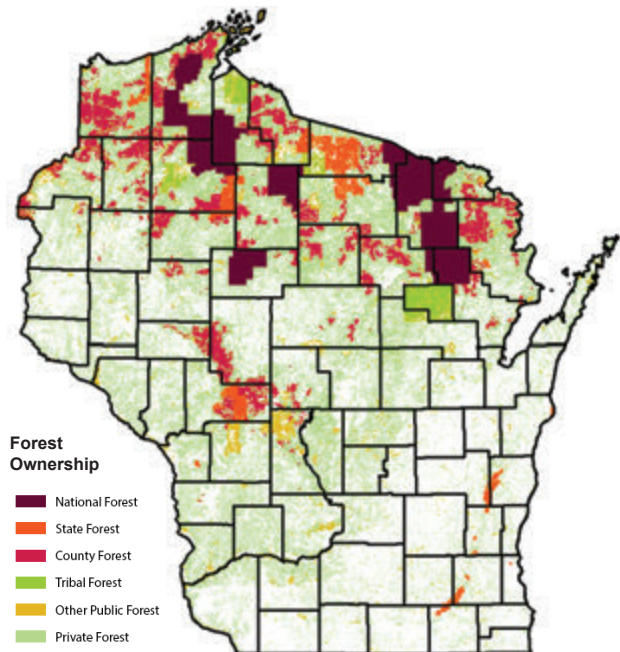


Forest Ownership

Ownership is a key factor in forest management. Figure 16 shows the pattern of forest ownership in Wisconsin. Roughly 70 percent of Wisconsin's forests are held under private ownership.¹¹² Private landowners include industrial landowners such as paper companies; large corporations such as Real Estate Investment Trusts (REITs) and Timber Investment and Management Organizations (TIMOs); American Indian tribes; and private woodland owners.

Individual and family owners account for the majority of private ownership in rural areas. There are an estimated 391,000 individual and family owners that care for more than 11 million acres of forest within the state.¹¹⁴ This ownership segment has grown considerably and is expected to keep growing as forest lands are subdivided and developed.

Figure 16
Forest Ownership in Wisconsin¹⁶



In urban areas, private landowners also play an important role in promoting the health and resilience of urban forests. More than 70 percent of Wisconsin's residents live in an urban or village setting. Within urban areas, two thirds of all trees grow in residential areas and are under private ownership. This suggests an important role for landowners to play in promoting the health and resilience of urban forests.

Large areas of federal, state and county-owned forest are also located in the state. Counties account for the largest share of public ownership. County forests range in size from 1,000 to 273,000 acres and cover a total of 2.4 million acres across 29 northern counties.¹¹⁵

The federal government is the second largest public landowner with nearly 1.6 million acres of forest. The U.S. Forest Service manages two national forests, collectively known as the Chequamegon-Nicolet

Figure 17
Wisconsin Forest Ownership¹¹⁴

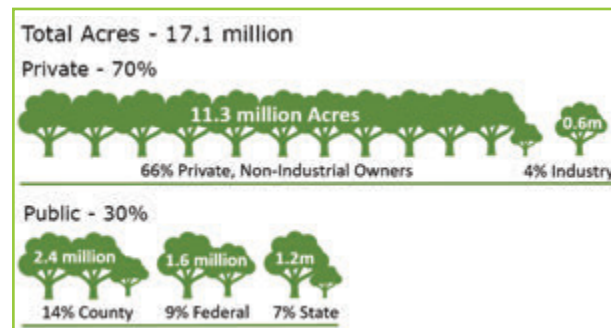
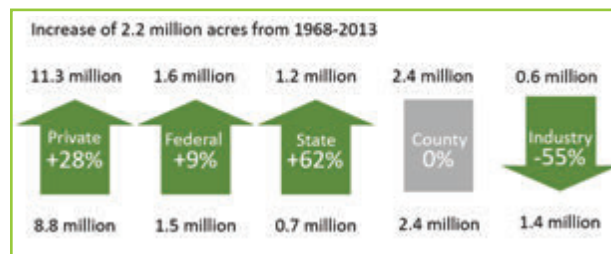


Figure 18
Trends in Forest Ownership¹¹⁴



National Forest. The Chequamegon side of the forest is centered around Park Falls and covers nearly 860,000 acres in six counties. The Nicolet side is located just east of Rhinelander and covers 660,000 acres in six counties.¹¹⁶ A small amount of additional forest land is managed by agencies such as the U.S. Fish & Wildlife Service and Department of Defense.

At 1.2 million acres, the State of Wisconsin owns the smallest share of public forest land. The Wisconsin Department of Natural Resources manages ten state forest properties that cover roughly 0.5 million acres.¹¹⁷ Forests are also located in Wisconsin's numerous state parks, wildlife areas and natural areas.

Benefits of Trees

Wisconsin reaps many valuable benefits from its abundance of forests and trees. Trees clean the air, store carbon dioxide, and contribute to reduced heating and cooling costs in both rural and urban areas. In addition, trees reduce the urban heat island effect and increase property values, among other benefits. Trees are an integral part of local ecosystems and help shape quality of life in both rural and urban areas. For more information on the value of trees, please visit our online resources.

Figure 16¹¹⁸
Trees contribute to human health and wellness by providing opportunities for outdoor recreation and exercise.



Economics

Wisconsin's forests are a critical component of the state's economy. Figure E1 provides a set of quick facts about the Wisconsin forest economy. Forests provide the raw materials for homes, offices, furniture, paper, medicines, paints, plastics and many other related products. More than 1,850 Wisconsin companies produce nearly \$20 billion of products each year using wood. Two-thirds of their raw material comes from forests located on private land. In total, 300,000 Wisconsin jobs rely on the forest products industry.^{E1}

Distribution of the Forest Economy

All Wisconsin counties are connected to the forest economy in some way. The maps below show the distribution of jobs associated with primary wood industries (growing and harvesting trees), secondary wood industries (producing paper and wood), and tertiary wood industries (advanced manufacturing involving paper or wood).^{E2}

Figure E2
Primary Wood Industry Establishments^{E2}

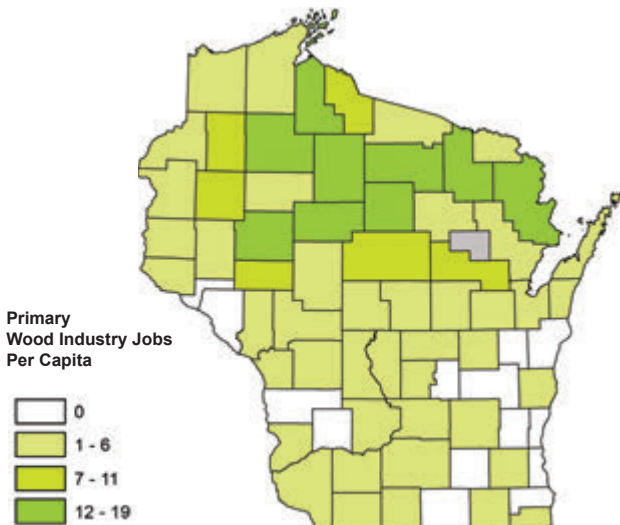
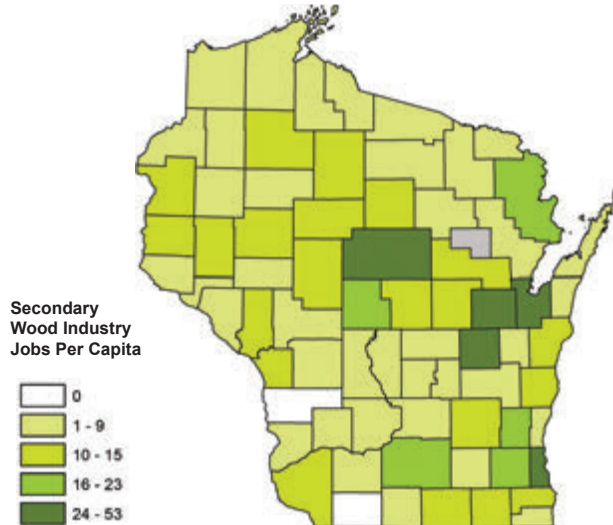


Figure E1
Quick Facts on Forest Economy^{E3}

- Forestry is the number one employer in 10 counties
- Forestry is one of the top ten industries by employment and output in Wisconsin
- Forestry provides 1.8% of the jobs and 4% of the output in the state
- Every job in forestry supports 1.7 additional jobs in the state
- Every million dollars of output in forestry creates \$721,000 of output in other sectors
- Wisconsin is the number one paper producing state in the U.S.
- Forestry is 2% of the state GDP
- Forest products international exports totaled \$2.2 billion

Output is the total value of the industry in the local economy

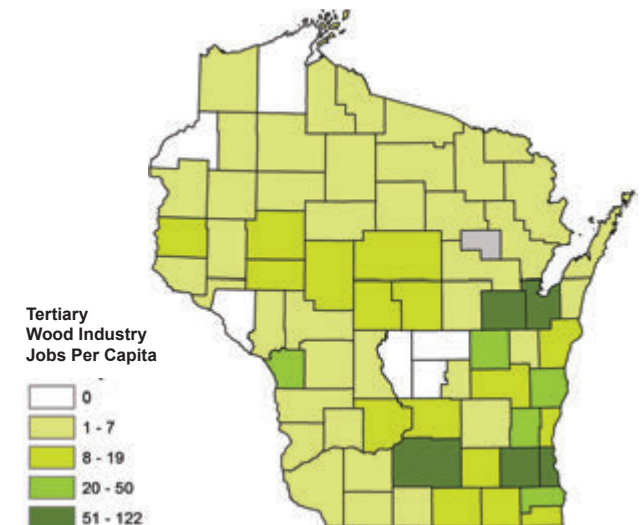
Figure E3
Secondary Wood Industry Establishments^{E2}



Primary wood industries include forestry and logging and are shown in Figure E2. The location of these industries coincides with the location of trees available for harvest. The impact of Wisconsin's northern forests is felt across the state, with raw materials being shipped to other communities for additional processing and value-added manufacturing.

Secondary wood industries take harvested timber and make it into a usable product. This category includes paper and wood product manufacturing and is shown in Figure E3. Paper is particularly important in the Green Bay-Fox Valley corridor, also known as the "Paper Valley." Historically, this region was an ideal location for industrial paper operations due to its proximity to water power, transportation routes, and rich reserves of northern Wisconsin forests.^{E4} Wood products, including lumber and building supplies, are most prevalent in the Wausau and Milwaukee metropolitan areas.

Figure E4
Tertiary Wood Industry Establishments^{E2}



Tertiary wood industries are those that take lumber and paper and make it into another product such as wood furniture, cabinets, or printed products. Industries that produce machinery for sawmills, woodworking, and industrial-scale paper-making are also included in this category. Figure E4 shows the concentration of these industries in some of our larger metropolitan and industrial hubs including Green Bay, Madison and Milwaukee.

While Menominee County is left out of the maps due to lack of data, the Menominee Tribe and Reservation, which coincides with county boundaries, has practiced sustainable forestry for over 150 years. These lands comprise 235,000 acres of which 217,000 acres are actively managed and contribute to all wood industries.^{E5}

Economic Impact

Wisconsin forests provide direct and indirect benefits to Wisconsin families, businesses and communities. The three industries in Table E1 are directly tied to Wisconsin's forests. These industries provide jobs in both rural and urban communities. Pulp and paper jobs are most significant, providing over 30,000 jobs, nearly \$20 billion in direct economic output, and \$4 billion in value-added contributions to the community (wages, rents, interest and profits).^{E6} Not shown are indirect impacts, which are also significant.

Table E1
Direct Economic Impacts^{E6}

	Employment	Output	Value Added
Sawmills and Wood Products	24,013 jobs	\$4.9 billion	\$1.5 billion
Pulp and Paper	30,614 jobs	\$18.7 billion	\$4.7 billion
Forestry and Logging	5,853 jobs	\$449 million	\$623 million
Total	60,480 jobs	\$24.1 billion	\$6.8 billion

Average annual wages for forest product industries are shown in Table E2. Wages range from about \$37,000 per year for machine operators to over \$100,000 for

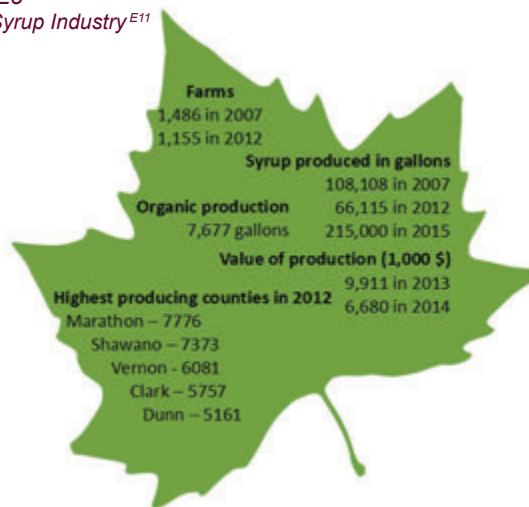
industrial production managers.^{E7} As a whole, these industries provide a living wage for families in Northern Wisconsin (this assumes two adults—one working, and one child).^{E8}

Table E2
Average Annual Wage by Forest Product Industry^{E6}

Industry	Average annual wage
Converted Paper Product Mfg	\$61,759
Wood Furniture Mfg	\$48,037
Wood Product Mfg	\$37,810
Pulp, Paper, & Paperboard Mills	\$71,473
Plywood & Engineered Wood Product Mfg	\$41,350
Sawmills and Wood Preservation	\$36,110
Logging	\$36,381
Support Activities for Forestry	\$42,517
Total*	\$47,083

Other important areas of the forest economy include maple syrup and cut Christmas trees, as shown in Figures E5 and E6. These products are considered agricultural and are included here because they are forest-related.

Figure E5
Maple Syrup Industry^{E11}



Future Outlook

Many traditional forest products industries are in a state of transition. Wisconsin has been the largest paper producing state in the country since 1953. However, many paper mills have closed or consolidated in recent years. With the growing digital economy, less paper is used for print products such as books, magazines and newspapers. Demand for corrugated cardboard (shipping boxes) and specialty papers remains high.^{E9}

There are fewer logging companies operating larger enterprises. Capital costs are high and present a challenge for those looking to enter the industry or expand operations. Many owners are also aging or retiring. Eighty percent of owners are over the age of 45 and less than half expect that they will pass their company on to the next generation. The logging industry has been able to continue to meet demand for wood because a small number of operations have increased production.^{E10} The continued ability of Wisconsin's logging and paper industries to thrive depends on their ability to adapt to meet changing needs.

Figure E6
Christmas Tree Industry^{E11}



Threats

Public and private forest managers across Wisconsin must deal with a range of stressors and threats to the forests that they manage. Figure T1 provides a list of major stressors and threats along with the projected changes and impacts on our forests. Each threat can stem from multiple social, economic, and ecological causes. As a result, management strategies are complex and sometimes call for a diverse professional team to devise and implement. With climate change expected to exacerbate many of these trends, forest managers and private landowners will need to take a more active role in managing our forests.

Figure T2 Flooded Farm, Rock County^{T4}



Figure T3 Germann Road Fire, Douglas County^{T5}



Figure T1 Stressors and Threats to Wisconsin Forests^{T1, T2, T3}



Higher temperatures and more intense precipitation.



Decline in habitat suitable for northern and boreal species such as paper birch, balsam fir, black spruce, and quaking aspen.



Damage to road networks resulting from high temperatures and more freeze-thaw events.



Increased severity, frequency and persistence of flood events.



Increased stress from forest pests, diseases, and non-native species.



Delays in forest management due to flooding and lack of frozen ground.



Longer growing season with potential for more forest growth.



Increased risk of wildfire due to warmer and drier conditions.



Over browsing by deer resulting in changes to forest structure, composition and diversity.



Changes in forest ownership and increased rates of parcelization and land use change.

Fire Risk and Housing

One of many risks associated with forests is the intermixing of housing and forests in the area known as the wildland-urban interface. The wildland-urban interface refers to a zone of transition between undeveloped land and land interspersed with human development. It can also refer to areas where housing and other forms of development are mixed with wildland fuels. As shown in Figure T4, areas of wildland-urban interface are present throughout much of Wisconsin's Northwoods. This suggests that homes and other structures in these areas are at a higher risk for wildfire.

Figure T5 shows the percent of seasonal housing units in Wisconsin. Many northern counties and parts of Adams, Juneau and Door County have very high percentages of housing that are seasonal. This means that landowners visit occasionally, and it is not their permanent residence. Many lake landowners and non-industrial private forest landowners are seasonal. If you compare Figures T4 and T5, there is a high correlation between seasonal homes and areas included in the wildland-urban interface. This can complicate efforts to manage the forest.

Figure T4 Acres of Wildland-Urban Interface^{T6}

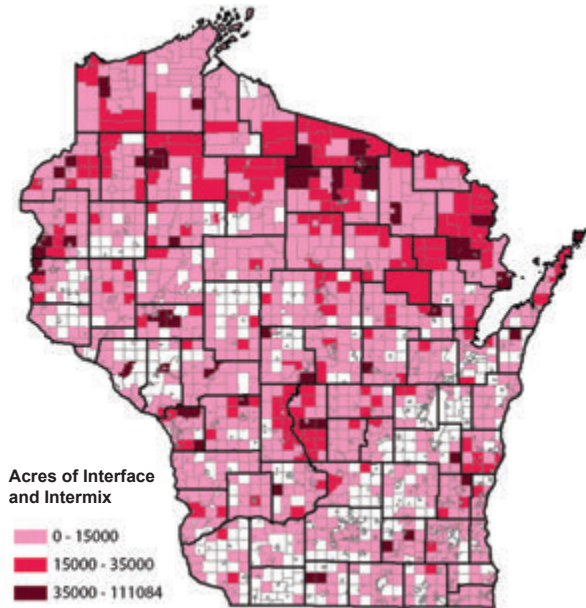
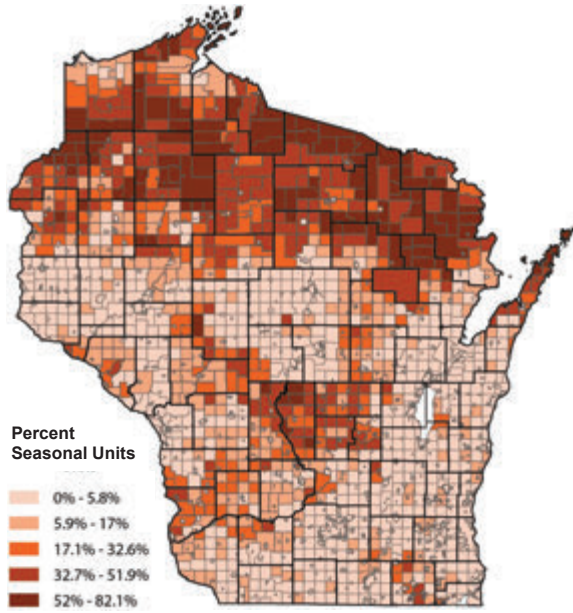


Figure T5 Percent of Seasonal Housing Units^{T7}



Pests and Disease

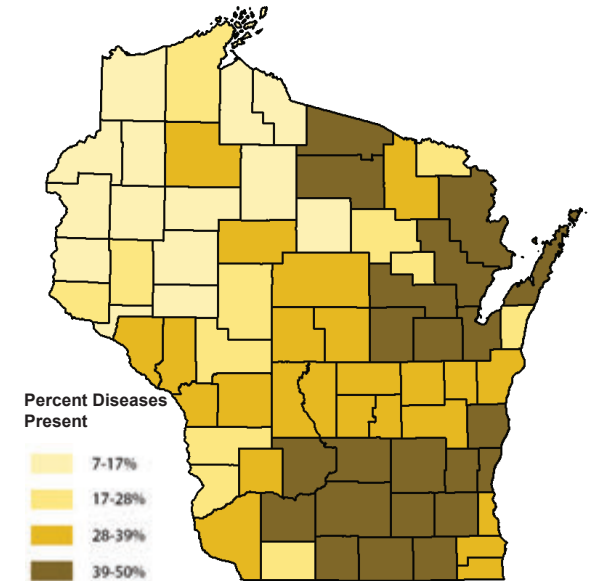
Wisconsin's forests are impacted by a range of insects, diseases, and other pests. Since at least 2003, the number of issues impacting Wisconsin forests has increased and spread. Figure T7 shows that all counties in Wisconsin are currently impacted by at least one out of fourteen known pests.^{T8} Figure T6 illustrates the range of pests impacting Wisconsin forests.

Some pests prey on particular species of trees. Examples of hardwood issues include bur oak blight (a fungal disease impacting oaks) and phytoplasma (a bacterial parasite impacting ash and hardwoods). Conifer issues include eastern larch beetle (a native bark beetle that feeds on tamarack) and spruce and jack pine budworm (moth larvae that feed on spruce and jack pines). With repeated attacks, these pests can weaken and potentially kill trees.

A range of exotic species are a problem in Wisconsin. Exotic insects include gypsy moth, emerald ash borer, and Japanese beetle. Other exotics include jumping worms, fungal diseases, and non-native tree and weed species. European Buckthorn is an example of a non-native tree that is spreading throughout Wisconsin. It is particularly prevalent in residential areas.

Trees in urban areas face a similar set of threats.^{T9} Gypsy moth, emerald ash borer, and pine shoot beetle

Figure T7 Extent of Forest Pests and Diseases^{T6}



currently present the greatest risks. Gypsy moth has the potential to impact 5.8 million trees or 13.6 percent of the urban forest. Though it hasn't reached Wisconsin yet, the Asian longhorned beetle presents an even greater risk. This insect preys on maples and other hardwoods and could impact up to a quarter of Wisconsin's urban trees. Lack of species diversity exacerbates threats to our urban forest.

Figure T6 Examples of the types of forest disease present in Wisconsin^{T8}

Exotic Pest Issues

Emerald Ash Borer^{T7}



Hardwood Issues

Bur Oak Blight^{T8}



Conifer Issues

Spruce Budworm^{T9}



Management

County Forests

County forests represent the state's largest public forest landholding. Collectively, 29 counties own 2.4 million acres of land that are sustainably managed under a unique state-county partnership.^{M1} County forests are managed to provide for a variety of public benefits and activities. These include public recreation, wildlife habitat, timber sales, fire protection, and long-term ecosystem and watershed health.^{M2} Timber management is a primary objective for many counties. Most produce a continuous supply of timber with revenues directly benefiting counties and participating towns. Many counties also manage their forests for recreation and tourism. The county forest system provides more than 9,100 miles of managed snowmobile trails, 1,700 miles of managed ATV trails, 3,300 campsites, and numerous hunting, fishing and recreational opportunities.^{M2} Each year, county forests produce \$30-40 million in direct timber sales.^{M1}

State Forests

The Wisconsin Department of Natural Resources (WDNR) manages state forest properties and other public lands for a variety of purposes. These include outdoor recreation, camping, wildlife habitat and timber management. Sustainable forestry practices are used in forest management with an eye toward maintaining

Figure M1
McKenzie Creek Wildlife Area^{M3}



a healthy forest, aesthetics, and local economies. Recognizing that the vast majority of forest land in Wisconsin is not publicly controlled, WDNR also works in partnership with private landowners and communities to provide funding and technical assistance for sustainable forestry practices at the local level.

Private Woodland

More than two-thirds of the state's forest lands are held in private ownership. Private woodland owners have a range of goals and objectives which may include timber production, wildlife habitat, recreation, or aesthetics. These goals are subject to change given landowners' changing attitudes and needs, financial situations, and ability to buy and sell land.^{M1}

A variety of funding and technical assistance programs are available at the federal, state and local level to assist private forest landowners. One of the most recognized is the Managed Forest Law (MFL) program. This is a tax incentive program that encourages sustainable forestry on privately-owned land. Once enrolled, MFL lands must be managed by the landowner in accordance with a forest management plan written by a certified consulting forester. In exchange, the landowner pays reduced property taxes. This program is structured to reduce the annual holding costs of land, thereby encouraging management practices that focus on long-term sustainability.

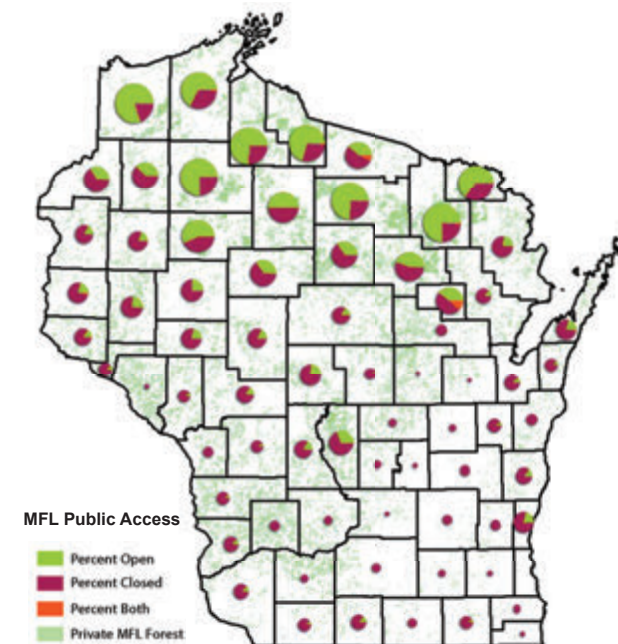
A forest management plan is a useful tool for identifying the landowner's goals and objectives, describing forest resources and conditions, and listing long-term management actions.

The MFL program also helps the state to meet public access and recreation goals. Enrolled lands can be designated as open or closed. Open means that the

property is open to the public for hunting, fishing, hiking, sight-seeing and cross-country skiing without additional permission from the landowner. Closed means that the landowner may permit or restrict access to their lands. The tax incentive for open land is considerably higher. Figure M2 shows the location of MFL lands and the percent open and closed to the public for recreation in each county. Statewide, there are approximately 1 million acres open to public access, and approximately 2.4 million closed acres.^{M5}

The Wisconsin Department of Natural Resources provides publications to assist landowners in managing their forest through good stewardship and best management practices. Guidance is also available through a network of WDNR foresters and private cooperating foresters.^{M1}

Figure M2
Managed Forest Law^{M4}



Urban Forests

In urban areas, just 15% of trees are located in public areas such as parks, natural areas, and public rights of ways. This means that roughly 85% of the urban forest is located on private land.^{M6} In Wisconsin, communities are increasingly recognizing the benefits of trees on private property and taking a “community canopy” approach to manage trees.^{M6} This means taking proactive steps to plan and care for trees on both public and private property. Working with landowners, businesses and developers, communities can more effectively manage for a variety of public objectives such as air quality, stormwater infiltration, climate regulation, energy use, wildlife habitat, public health, aesthetics and property values.^{M7} As one example, site planning techniques to promote energy savings are shown at right.

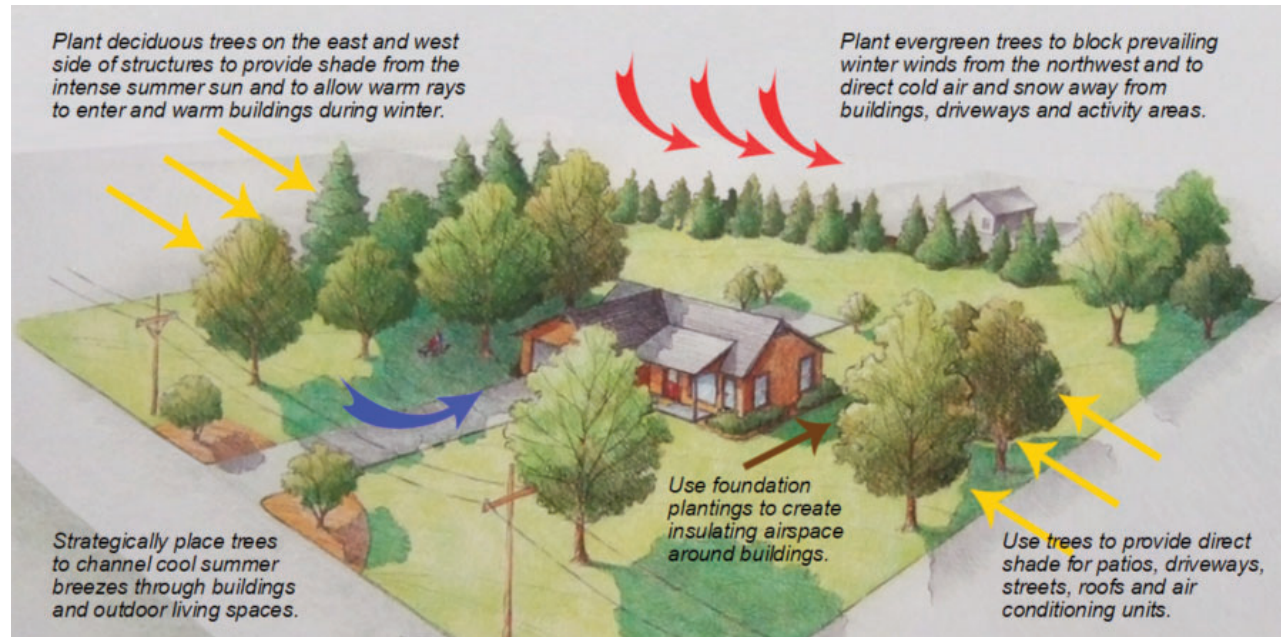
Following are some additional steps local governments can take to plan and care for the urban forest:

- Embed consideration of trees and forests into community plans, regulations, budgets, and actions.
- Provide dedicated funding for urban forestry.
- Establish tree preservation, planting and maintenance programs and ordinances.
- Inventory and map existing tree resources, including conditions and threats.

*Table M1
Municipal Forest Planning Roles^{M9}*

Department	Role in Caring for the Forest
Forestry	Establish a municipal forestry program and provide proper tree care management
Parks and Recreation	Plan for tree canopy, parks, recreation and outdoor experiences
Planning and Zoning	Account for trees in plans, policies, and land development regulations
Public Works	Include trees in stormwater management and green infrastructure plans
Transportation	Promote street and sidewalk design that accommodate trees
Economic Development	Support greening efforts as a means to promote economic development
Public Health	Promote access to nature and the health benefits of a natural environment

*Figure M3
Landscaping to Maximize the Benefits of Trees for Energy Savings^{M8}*



- Set tree canopy goals and track metrics.
- Communicate the benefits of the urban forest.
- Involve residents in tree protection through education, planting projects, and local tree boards.
- Work with elected officials and developers to review zoning, subdivision and other land development codes.
- Partner with conservation organizations and land trusts to protect and direct development away from forests and other sensitive lands.
- Work across municipal departments to plan and care for the urban forest. Table M1 outlines additional roles local governments can take to care for the urban forest.

The Wisconsin Department of Natural Resources is working to inventory, map and assess urban forest conditions across the state. They also provide grants and technical assistance to support urban forestry.^{M10}

Acknowledgments and References

On The Web

The Wisconsin Land Use Megatrends series is on the Web at www.uwsp.edu/cnr-ap/clue/Pages/publications-resources/LandUseMegatrends.aspx. Other topics include transportation, housing, water, agriculture, climate change, energy, and recreation.

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Cover

The cover map used the following sources: County Code Industry data from the United States Census Bureau, American Fact Finder.

Timeline Photos

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