

# The Citizen Forester

JUNE 2017  
NO. 203

## Plant Water Use and the Impact of Drought

By Mandy Bayer All areas of Massachusetts experienced some level of drought in 2016.

Although the timing and severity may have differed, many plant responses were similar. To understand why plants have certain responses to water stress and to predict longer-term impacts of drought, it is important to consider some of the ways plants use water.

Plants use water in four main ways, including transpiration, transport of mineral nutrients, metabolic processes, and for turgor pressure. Transpiration is the evaporation of water from plants to the atmosphere. It is the process by which plants are cooled and is dependent on humidity. Lower humidity and higher temperatures increase the rate of transpiration. Mineral nutrients from the soil are dissolved in water and move from the roots through the xylem to the leaves where they are utilized in processes such as photosynthesis. Water is also needed for photosynthesis, as well as other metabolic reactions. The production of carbohydrates, proteins, plant hormones, and secondary metabolites can all be disrupted by water stress. Turgor pressure provides structure and is needed for cell elongation. Turgor pressure is needed for non-woody plants to remain upright.

Most horticultural plants have mechanisms that are utilized or developed to retain or obtain water during drought. These mechanisms can be plant traits that are present before drought stress occurs, such as deep root systems, growing in an ecological niche, or leaf features. Deep root systems allow plants to have access to water over a greater area of the soil profile. Some plants grow in areas where drought is unlikely or may be an ecotype that is more tolerant of drought. Leaf features that help plants withstand drought include thick, fleshy stems and

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Plant damage from the top down and/or the outside in is a sign of damage from drought stress.

leaves that can store water, waxy-coated leaves that help to reduce transpiration, hairy leaves that help to reduce wind movement around leaves (reducing transpiration), light-colored foliage (silver, gray, blue, white), which reflects light (reducing heating), and narrow leaves, which reduces the surface area for heating.

Other mechanisms are in response to drought. Plants close their stomata in response to soil drying to decrease transpiration. Leaf movements, including rolling, wilting, and changing orientation, can reduce heating of leaf surfaces via light and/or limit transpiration. Rolling leaves reduces the leaf areas exposed to light (therefore heating), reduces area movement along the leaf surface, and creates a high humidity environment within the roll, which reduces transpiration. In some cases plants may even drop some or all of their leaves to reduce transpiration.

Short-term drought symptoms can include marginal leaf scorch, rolled or folded leaves, leaf drop, early fall color, wilting, off-colored or yellow leaves, twig and branch dieback, and reduced growth. These symptoms can be

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# Drought Plant Water Use and the Impact of Drought

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the result of reduced water for transpiration, nutrient deficiencies due to reduced transport, and/or reduced photosynthesis.

Reduced photosynthesis can be the result of fewer leaves, closed stomata, or changes in leaf orientation. Over long periods of time, this can lead to reduced growth and reduced carbohydrate production and storage.

Moving into 2017, the extent of continued damage will be variable, depending on the type of plant, extent of establishment, type of soil, the area in which the plant is **located, and how long the drought continues.** [Editor's note: as of May 16, all of Massachusetts was out of drought status.] There is a greater likelihood of damage with new plants, plants with smaller root systems, plants with shallow root systems, plants with injuries, or plants with poor or damaged root systems.

Damage caused by water stress in 2016 may become evident in ways other than drought stress symptoms. During the winter, drought-stressed plants will be more likely to have weakened branches break during storms. Drought-stressed plants are also more susceptible to typical winter injuries, including desiccation (especially broadleaved evergreens), sunscald, frost-splitting, winter burn, or dieback. Stressed plants are also more likely to have increased injury from de-icing salts, as high concentrations of de-icing salts can cause additional drought stress.

It can be challenging to identify symptoms of drought stress, as many of the symptoms can be similar to those of other stressors, such as nutrient deficiencies or diseases. In general, injury from drought stress usually occurs from the top of plant down and from the outside in. For evergreens, needle-browning occurs from the tip downward. Other symptoms can include fewer and/or smaller leaves, shorter branches, less flowers and/or fruit, loss of branches, heavy seed loads, and dieback.

Root hairs and feeder roots, which are generally located in the upper foot of soil, are usually the first to die during drought. These are the roots that take up the greatest amounts of water and nutrients, so even as the drought



Rolled leaves are a symptom of drought stress and are a mechanism for reducing water loss through transpiration.

lessens, plants can still have reduced water and nutrient uptake, as it can take years for root systems to be repaired. This can lead to nutrient deficiencies even when nutrients are present in the soil.

Drought-weakened plants have increased susceptibility to insects and diseases. Disruption of metabolic processes also means that the production of protective chemicals is reduced. Plants, especially plants with physical damage, such as cracks in branches, should be monitored. Root rots, cankers, wood rots, spider mites, and wood-boring insects are more likely to occur in response to drought stress.



Eliminate weeds to reduce competition for available water.

## Moving Forward....

In developing new landscapes or maintaining existing landscapes, it is important to consider water conservation principles in design, installation, and maintenance to help promote more sustainable landscapes.

- Design with irrigation and plant water needs in mind.
  - Group plants by water needs and to allow for reduced and efficient irrigation practices.
- Improve or maintain soil structure to promote water conservation.
  - Avoid compaction
  - Prevent runoff
- Improve soil organic matter (get soil [tested!](#))
- When irrigation is possible, make sure it is efficient.
  - Use drip irrigation or soaker hoses
  - Maintain irrigation systems to avoid water loss and improve application efficiency and uniformity
  - Adjust applications according to environmental conditions and changing plant water needs
  - **Plants need around 1" of water per week, applied slowly to a depth of 8-12"**
    - Frequency and duration will depend on soil and weather
  - Remember plants need 2-3 years for establishment.
- Use mulch to reduce evaporation from the soil
  - **2-4" layer, kept away from the trunk/base of plant**
  - Helps control fluctuating soil temperatures
  - Adds organic matter to the soil
  - Helps reduce weeds

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# Plant Water Use and the Impact of Drought

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- Choose the right plant for the right place (including turf)
  - Group plants to help improve irrigation efficiency.
- Appropriate maintenance
  - Avoid over-fertilization, as it increases growth, which increases the water demand of the plant (to find out about nutrient needs, get your soil [tested](#).)
  - Control weeds to reduce water competition
  - Only prune damaged or dead branches to avoid increasing the amount of stress on the plant

## Sources

Caldwell, Ainsley. [Drought and Urban Trees](#). City of Atlanta Department of Planning & Community Development. 2017, 2/13.

Douglas, Sharon. 2002. [Minimizing the Long-Term Effects of Drought on Trees and Shrubs](#). The Connecticut Agricultural Experiment Station.

Hopkins and Hüner. 2004. *Introduction to Plant Physiology*. 3<sup>rd</sup> Edition. John Wiley & Sons Inc., Hoboken, NJ.

Kujawski, Ron. 2011. [Long-term Drought Effects on Trees and Shrubs](#). UMass Extension.

Seymour, R. M. and G. L. Wade. [Make Every Drop Count: Xeriscape- Seven Steps to a Water-Wise Landscape](#). University of Georgia Extension.



Increased winter desiccation injury is possible with drought stressed plants, especially broadleaved evergreens.

Mandy Bayer is the extension Assistant Professor of Sustainable Landscape Horticulture in the UMass Stockbridge School of Agriculture.

## Species Spotlight—Mountain laurel, *Kalmia latifolia*

By Mollie Freilicher, Community Action Forester



Flowers (Mollie Freilicher)

Mountain laurel is a small broadleaf evergreen shrub, in the Ericaceae family, native to woodlands of eastern North America, from southern Maine to northern Florida, west to eastern Louisiana, and north to southeastern Indiana. It is often found at woodland edges or sometimes in wetlands or at the edge of wet areas. It can form dense thickets that can frustrate hikers

trying to make their way through and is a little infamous for its thicket-forming ability. In the planted landscape, mountain laurel grows six to ten feet tall, with a similar spread, and at maturity can have a graceful, yet gnarled appearance, with its twisting trunks.

The genus *Kalmia*, comes from Pehr Kalm, the Swedish-Finnish botanist-explorer, and student of Linnaeus. In 1748, Kalm traveled to North America looking for plants that could be cultivated in Scandinavia. One of the plants he wrote about in his three-volume *Travels in North America*, published in 1770, was mountain laurel. Of the **flowers, he wrote that they “rival that of most of the**

**known trees in nature.” Kalm also appreciated that “they have the quality of preserving their fine green leaves throughout the winter, so that when all other trees have lost their ornaments, and stand quite naked, these cheer [sic] the woods with their green foliage.” (Something to think about the next time you find yourself stuck in a thicket in winter.) The specific epithet “latifolia” comes from the Latin for “broad-leaved.”** Mountain laurel is hardy in zones four to nine. For the period of bloom in late May and early-to-mid June, these are stars of the woods.



Leaves and fruit (John Seiler, Virginia Tech)

G. B. Emerson in his 1846 *Report on the Trees and Shrubs Occurring Naturally in the Forests of Massachusetts* observed that mountain laurel was found throughout the state and that in the woods, it reached heights of 15 feet. Emerson expounds on a site near Meetinghouse Pond in Westborough that filled with islands of bloom in June and July that **“was worth going out of one’s way to see.”**

Leaves of mountain laurel are alternate, entire, and

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# Species Spotlight—*Kalmia latifolia*, mountain laurel

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Twig (John Seiler, [Virginia Tech](#))

clustered toward the tips of twigs. They are elliptical in shape, two to five inches long and up to one-and-a-half inches wide, with a pointy tip. They are a glossy dark-green color. As evergreens, they retain their foliage through the winter.

Bark of mountain laurel is brownish-tan in color and is ridged and peely. Trunks are often twisted or gnarled. Twigs are brown when young and become green or red in color as they mature.

Flowers bloom in late-spring to early summer and are pink or reddish to white in color and last for at least two weeks. They occur in 4-6 inch-diameter clusters at the tips of branches. Initially the flowers are pinkish, and they fade to white. Each flower, cup or bell-like, with fused petals, is about an inch in diameter. The fruit, a brown capsule, is not ornamental.

In the landscape, mountain laurel can grow in partial shade to full sun. Mountain laurel grows best in cool, acidic, well-drained soil, but can be subject to desiccation on windy sites.

Like its herbaceous relative *K. angustifolia*, also called sheep kill or sheep laurel, mountain laurel is poisonous to livestock, though Native Americans have used parts of the plants for medicinal purposes. Of the wood, Kalm writes that the wood of mountain laurel is very hard and that the wood was favored for weaving shuttles and was a favorite of joiners and turners.

Mountain laurel is a great addition to partly-shaded areas and to naturalized landscapes, where it can thrive under the (not too-heavily shaded) canopy. Flowering will be best, though, in locations that are sunnier. Planted as a group or mass, mountain laurel can be dramatic in its flowering and dramatic in its twisty gnarled form at maturity. As far as insects go, leaf spot and lacebugs can

be problematic, and mountain laurel will not do well in high pH soils. Mountain laurel does support native wildlife and Doug Tallamy includes it in his list of suggested plants for New England in *Bringing Nature Home*, which encourages readers to “sustain wildlife with native plants.”



Form and natural habitat (Mollie Freilicher)

Mountain laurel is easy to transplant and there are many cultivars that have interesting characteristics, such as ‘Carousel,’ which has a pattern of cinnamon-purple bands around the edge of the corolla, ‘Elf,’ a dwarf form with flowers almost the size of the species, ‘Raspberry Glow,’ a form with burgundy-red buds that open to burgundy-



Bark (John Seiler, [Virginia Tech](#))

red flowers, and ‘Sarah,’ another variety with red buds and pink-reddish flowers. Dirr lists over 60 cultivars, many of which can be easily found in Massachusetts. If you haven’t already, make some space in your community for this plant, which Emerson wrote was “richly deserving a place in every American garden.”

## References

- Dirr, Michael A. 1998. *Manual of Woody Landscape Plants*. 5<sup>th</sup> Edition. Stipes: Champaign, IL.
- Harrison, Mary. 1993. Plant History: Expanding the Horizons of a Small Garden. *Arnoldia*. (53:1).
- Tallamy, Doug. 2007. *Bringing Nature Home*. Timber Press: Portland.
- Virginia Tech. [vTree](#).

# 2017 Urban and Community Forestry Challenge Grant Awards

Boston –The Baker-Polito Administration has announced \$112,500 in 2017 Urban and Community Forestry Challenge Grants to nine Massachusetts municipalities and non-profit organizations to maximize the social, economic, and environmental benefits of increased tree canopy in communities across the Commonwealth. The funds for the 50-50 matching grant program are provided by the United States Department of Agriculture’s (USDA) Forest Service and the Massachusetts ReLeaf Trust Fund, and are administered by the Massachusetts Department of Conservation and Recreation (DCR).

**“By working in partnership with the USDA Forest Service, municipalities, and nonprofits, our administration will continue its commitment to more trees for our communities,”** said Governor Charlie Baker. **“The awarding of this year’s Urban and Community Forestry Challenge Grants will strengthen and diversify local tree stocks, which provide real benefits like lower heating and cooling costs for Massachusetts families and businesses.”** **“Planting trees helps build stronger and more resilient communities within the Commonwealth,”** said Lieutenant Governor Karyn Polito. **“Across Massachusetts, our administration is dedicated to increasing the state’s diverse urban and community tree inventory to ensure they remain healthy and vibrant for our citizens to enjoy for years to come.”**

The 2017 Urban and Community Forestry Challenge Grants, which range from \$3,000 to as much as \$30,000, will assist in the following key areas:

- Building and strengthening citizen advocacy;
- Developing and adopting tree and forest ordinances and policies;
- Securing or training professional staff;
- Developing and implementing an urban forestry management plan;
- Attaining a Tree City USA Award;
- Completing strategic community tree plantings and **“Heritage Tree” care projects; and**
- Other projects that are well-conceived and will result in sustained improvements to urban and community forestry management in other areas.

**“Our Commonwealth has a long, proud history of conservation efforts, and it gives me great pleasure that the Baker-Polito Administration has partnered with these communities and organizations, who have pledged to strengthen our state’s tree infrastructure,”** said Energy and Environmental Affairs Secretary Matthew

Beaton. **“Not only do trees reduce energy needs on local homes and businesses, but they also provide us with cleaner air, reduce noise pollution, beautify neighborhoods, reduce storm water runoff, and offer additional habitats for animals.”**

**“The Urban and Community Forestry Grants Program serves as an excellent example of the Baker-Polito Administration’s dedication to fostering partnerships with communities, nonprofit organizations, and other entities to reach a common goal that will truly benefit the public,”** said DCR Commissioner Leo Roy. **“I would like to thank all of this year’s applicants for producing such strong proposals, and we look forward to watching as these projects grow.”**

One of the nine grant awards were funded from the Mass ReLeaf Trust Fund utilizing donations from the National Grid Corporation. National Grid contributes to DCR to offer Urban Forestry Challenge Grants in pre-determined amounts to communities affected by the company’s hazard tree removal program, which identifies and targets trees near main power feeder lines.

The following proposals were awarded 2017 Urban and Community Forestry Challenge Grants:

Arlington Tree Committee and Town of Arlington DPW (\$15,000) Title: Arlington Street Tree Inventory	Town of Milton DPW (\$3,500) Title: Milton Community Street Tree Reforestation Program
Town of Deerfield and the Franklin Regional Council of Governments (\$20,000) <b>Title: Deerfield’s Public Trees: Planning and Planting</b>	City of Salem (\$30,000) Title: Citywide Tree Inventory and Analysis
City of Gardner (\$4,000) Title: Tree Replacement Project (funded by the Mass ReLeaf Trust, with funds from National Grid)	City of Pittsfield (\$3,000) Title: Wellesley Park Tree Replacement Project Phase II
Town of Greenfield (\$5,000) Title: 2017 Tree Planting Program for Greenfield	Walpole Highway, Parks and Cemeteries (\$20,000) Title: Strategic Tree Inventory and Tree Health Survey
	Applicant: Worcester Tree Initiative (\$12,000) Title: Urban Tree Stewards – Youth Program

Read the full press release at [mass.gov](http://mass.gov).

# Growing on Trees—Webcasts and Events

## Urban Forest Connections

The **USDA Forest Service's Urban Forest Connections** webinar series brings experts together to discuss the latest science, practice, and policy on urban forestry and the environment. These webinars are open to all. Past webinar presentations and recordings are available [here](#).

Citizen Science and Open Data in Urban Forestry: Opportunities and challenges

June 14, 2017 | 1:00—2:15 p.m. (Eastern)

Lara Roman, USDA Forest Service  
Deborah Boyer, Azavea

To access the webinar, go to <https://www.fs.fed.us/research/urban-webinars/>.

Future webinars:

July 19, 2017 – Third Wednesday this month!

August 9, 2017

September 13, 2017

## TREE Fund Webinar

Soil Profile Rebuilding:  
Rehabilitating Compacted Soils  
Dr. Susan Day, Virginia Tech  
June 21, 2017 | 2:00 -3:00 p.m. (Eastern)

**If you've ever faced the problem of how to grow trees in compacted, rock-hard soils left behind after urban development and construction, then this is the webinar for you.** Dr. Day will teach you the secrets of Soil Profile Rebuilding (SPR), the soil rehabilitation method that allows you to remediate soils on-site, has a lasting effect, and can result in as much as 84% greater canopy relative to trees in untreated soil.

[Pre-registration](#) is recommended.

Log in [HERE](#) on June 21.

1 CEU available from ISA or SAF.

*Thank you to Utah State University Forestry Extension and Utah Division of Forestry, Fire and State Lands for hosting this program. Visit [treefund.org/webinars](http://treefund.org/webinars) to see upcoming webinars and to watch past broadcasts.*

## From the N.E. Wildflower Society

Introduction to Plant Families – July 5  
New England Plant Communities – July 6  
Tree Identification – July 26  
Native Woody Plant Materials – August 30  
Native New England Shrubs – September 7

More  
[info](#)

## Urban Forestry Today Webcast

Is Climate Change Real?

June 1, 2017 12:00 p.m. – June 12, 2017 1:00 p.m. (Eastern)

Dr. Katharine Hayhoe, Texas Tech University

From cities to farmlands, from forests to oceans, climate impacts virtually all facets of our daily lives. Join Dr. Katharine Hayhoe, Professor and Climate Scientist, Texas Tech University, as she outlines the facts and fallacies of global climate change and its impact on the environment around us.

To attend live, & receive free CEU, go to: [www.joinwebinar.com](http://www.joinwebinar.com) and enter the ID code: 811-772-323.

This broadcast is free and will offer the opportunity to earn 1.0 ISA CEU and 0.5 MCA credit.

For more information, contact:

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*The Urban Forestry Today 2017 Webcast Series is sponsored by the University of Massachusetts Department of Environmental Conservation, in cooperation with the USDA Forest Service, Massachusetts Department of Conservation and Recreation, University of Massachusetts Extension, and Massachusetts Tree Wardens' & Foresters' Association.*

## FEMA Webinar: FEMA Reporting: A Sustainable Approach

June 6, 2017 | 4:00 p.m. (Eastern)

A disaster could happen any minute — is your local government prepared to submit required reports to the Federal Emergency Management Agency? Or, will your team waste hundreds of hours scrambling to provide FEMA with activity plans, time records, material usage, and photos for reimbursement?

## From the Arnold Arboretum

Exploring the Arboretum for Educators – First Saturdays  
ID the 25 Most Common Trees in Boston – June 11  
In the Groves: A Summer Solstice Journey – June 16/17  
Drought-Tolerant Plants... – July 11  
Thoreau and the Language of Trees – July 8

More  
[info](#)

# Growing on Trees

## Western Mass Tree Wardens' Summer Dinner Meeting

Tuesday, June 20, 2017, Northampton, MA

- 5:00—5:15 Gathering
- 5:15—5:45 Forest Health Update--*Nicholas Brazee, UMass Extension*
- 5:45—6:15 Dinner
- 6:15—7:15 Safety and Efficiency of Mechanized Urban Tree Care--*Dan Mayer, Mayer Tree Service*
- 7:15—7:30 Wrap-up and evaluations

Dinner Cost \$30

*MCA and ISA credits have been requested.*

Registration deadline: June 15.

For more information, call or email:

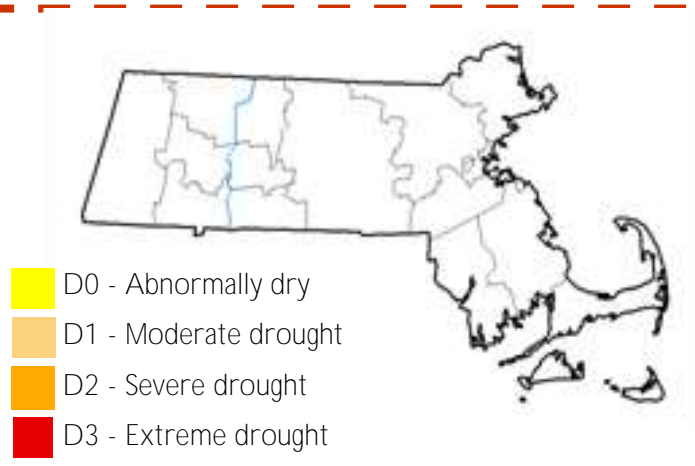
781-894-4759 • [info@masstreewardens.org](mailto:info@masstreewardens.org)

## Drought Monitor

Conditions as of [May 23, 2017](#) . It has been a while **since we've seen the map look like this!** Currently, 100% of Massachusetts is out of drought condition.

<http://droughtmonitor.unl.edu/>

Massachusetts drought resources may be found here: <http://drought.unl.edu/Planning/DroughtPlans/StatePlanning.aspx?st=ma>



## Growing Greener—in Salem



Salem Common.  
(Photo: [Henry Zbyszynski](#))

The City of Salem was recently awarded a DCR Urban and Community Forestry Challenge Grant for \$30,000 to conduct a citywide tree inventory and analysis. The City will work with a consultant and will partner with Salem Sound Coastwatch, which will organize volunteers to assist with the inventory. The \$70,700 project will be matched with a \$30,000 cash match, \$2,200 in-kind match from the city and Salem Sound Coastwatch, and \$7,500 in volunteer value. The city is seeking to develop its urban forestry program and utilize a database to systematically track tree work. The city conducted a pilot inventory and estimates that there are 18,600 street trees in the city. While not part of this project, the inventory and analysis will allow the city to take the next step to develop a comprehensive urban forestry management plan.

# Big Tree Spotlight—Sunderland Buttonwood

By Mollie Freilicher **This month we're kicking off a** new occasional feature for the *Citizen Forester* where we highlight big and notable trees around the Commonwealth. These may include **our state champion trees, "big" trees, or otherwise noteworthy trees. We'll start off with an old friend,** the Sunderland Buttonwood (aka Sunderland Buttonball or Sunderland Sycamore). The Sunderland Buttonwood is our state champion American sycamore (*Platanus occidentalis*).

Size:

Circumference (in): 309.6

Height (ft): 109.8

Average Spread (ft): 130

Total points: 452



Photo by Pennington Geis, [Panoramio.com](http://Panoramio.com)



Henry Brooks, *The Big Buttonwood, Sunderland*, 1890, Photogravure  
The J. Paul Getty Museum, Los Angeles

The exact age of the tree is not known, but it is thought to be between 350- 400 years old. There is not much historical information on the tree, but it is believed that the local militia may have gathered under the tree. It is included in the *List of Large, Old and Interesting Trees* (1892), and *History of the Town of Sunderland* (1899), where it gets a passing reference, **along with another buttonwood that, to the author's "infinite disgust," had been removed upon the author's return on a visit home.**

The Sunderland Buttonwood is also highlighted in the American elm-heavy *Historic Trees of Massachusetts* (1909), where it is one of a few buttonwoods included. The tree is located on Route 47, just north of the intersection with Route 116. There is a plaque in front of the tree, placed at the bicentennial of the signing of the Constitution in 1987, which reads:

1787 THE NATIONAL 1987  
ARBORIST ASSOCIATION  
AND  
THE INTERNATIONAL SOCIETY  
OF ARBORICULTURE  
JOINTLY RECOGNIZE THIS  
SIGNIFICANT TREE IN THIS  
BICENTENNIAL YEAR AS  
HAVING LIVED HERE AT THE  
TIME OF THE SIGNING OF  
OUR CONSTITUTION



# Gleanings

## Assessment Concludes Urban Forests in Chicago Region Face a Warmer, Wetter Future

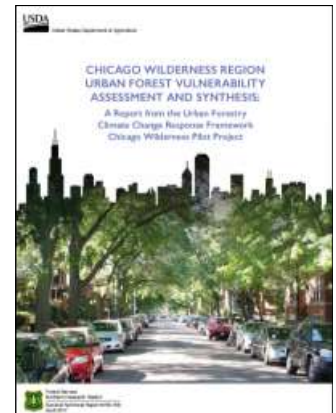
May 9, 2017—In a first-ever assessment of urban forest vulnerability to climate change in the Chicago region, a team led by the USDA Forest Service concluded that native tree species in a 7-million-acre area may decline, while invasive species may thrive with shifts in habitat suitability.

Seventeen percent of the [tree species](#) currently present in the [region](#) have either moderate-high or high vulnerability to [climate change](#), and 77 percent of individual trees with low vulnerability are [invasive species](#).

"The value of assessing the region's vulnerability to climate change is that it gives decision-makers, land managers, and homeowners an opportunity to plan ahead," said Leslie Brandt, a climate change specialist with the Forest Service and lead author of the Chicago region assessment.

"Communities have invested in their [urban forests](#), and the information that we provide can be used to maintain healthy forests that continue to provide services like removing pollutants from the air, reducing energy costs, and managing stormwater."

Published this week by the USDA Forest Service's Northern Research Station, the assessment evaluates urban forests within a region served by Chicago Wilderness, an alliance of more than 200 organizations working to improve the quality of life for people and improve natural resources in portions of Illinois, Indiana, Michigan, and Wisconsin. The vulnerability assessment documents past and current conditions and synthesizes the potential impacts of climate change on urban forests in the Chicago Wilderness region. The assessment also presents case studies of assessing vulnerability at the scale of municipal forestry and parks departments and describes future management considerations. The assessment also provides a process for municipalities, park districts, and [forest](#) preserve districts to assess their vulnerability to climate change, based on impacts and adaptive capacity. Read the full story at [phys.org](#) and view the report [here](#).




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## Greening the Gateway Cities



Greening the Gateway Cities crews from Revere and Lynn plant Persian parrotias on Lynn Common in Lynn. (Photo: Mike Griffin, DCR)



Greening the Gateway Cities crew from Lynn plants a tree in a backyard. (Photo: Mike Griffin, DCR)

# Gleanings

## The Wooden Skyscrapers That Could Help to Cool the Planet

Large timber buildings are getting safer, stronger and taller. They may also offer a way to slow down global warming.

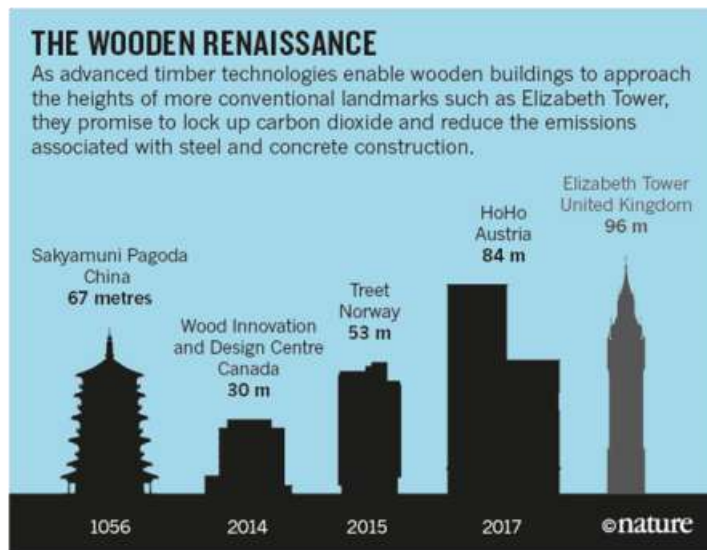
By Jeff Tollefson

May 17, 2017—One building stands out in the old logging town of Prince George, Canada. Encased in a sleek glass facade, the structure towers above most of its neighbors, beckoning from afar with the warm amber glow of Douglas fir. Constructed almost entirely from timber in 2014, the 8-story, 30-metre building is among the tallest modern wooden structures in the world. But it is more than an architectural marvel. As the home of the Wood Innovation and Design Centre at the University of Northern British Columbia (UNBC), it is also an incubator for wooden buildings of the future — and a herald for a movement that could help to tackle global warming.

The building is less like a log cabin and more like a layered cake, constructed from wooden planks glued and pressed together, precision-cut by factory lasers, and then assembled on site. All told, the university avoided the release of more than 400 tonnes of carbon dioxide by eschewing energy-intensive concrete and steel, and the building locks up a further 1,100 tonnes of CO<sub>2</sub> that was harvested from the atmosphere by British Columbian trees. In total, that's enough to offset the emissions from 160 households for a year.

Wooden construction has ancient roots, but only in the past two decades have scientists, engineers, and architects begun to recognize its potential to stave off global warming. By substituting concrete and steel with wood from sustainably managed forests, the building industry could curb up to 31% of global carbon emissions, according to research<sup>1</sup> by Chad Oliver, a forest ecologist at Yale University in New Haven, Connecticut. In time, such a shift could help humanity to pull CO<sub>2</sub> out of the atmosphere, potentially reversing the course of climate change. **"It's the plywood miracle," says Christopher Schwalm, an ecologist at Woods Hole Research Center in Falmouth, Massachusetts. "This is something that could have a significant impact on the riddle that is global environmental change."**

Read the full story at [Nature.com](http://Nature.com). (*Nature* 545,280–282 (18 May 2017) doi:10.1038/545280a)




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### **To Whom Does a City's Nature Belong? Is it a Common Pool**



**Resource, or a Public Good? And Who Decides?**

Read 15 global perspectives on these questions at [The Nature of Cities](http://The Nature of Cities).

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### **American Chestnut Rescue Will Succeed, But Slower Than Expected**

May 16, 2017—The nearly century-old effort to employ selective breeding to rescue the American chestnut, which has been rendered functionally extinct by an introduced disease—chestnut blight - eventually will succeed, but it will take longer than many people expect. That is the gist of findings from a new study conducted by a research team composed of scientists from Penn State, The American Chestnut Foundation, and the State University of New York. This research should tamp down expectations of both the public and some members of the science community that victory is imminent, but it also provides reassurance that the rescue ultimately will result in chestnuts flourishing in forests again, according to lead author Kim Steiner, professor of forest biology, Penn State College of Agricultural Sciences. Read the full story at [phys.org](http://phys.org).

## News

**Belchertown Establishes First Town Forest**  
At Town Meeting on May 8, the Town of Belchertown voted to approve the purchase of 86 acres to become **the first town's first town forest, the "Mader Town Forest," which will come under the jurisdiction of the Conservation Commission. In addition to being the town's first town forest, this is also the first time in the town's history that timber value will offset the cost of purchase.**

### Embedded in Harvard Forest for One Year, To Study One Tree

By Carrie Healy

May 10, 2017—Author Lynda Mapes spent a year in the Harvard Forest in Petersham, Massachusetts, chronicling a single tree. This red oak stands in one of the oldest and most intensively studied research landscapes in North America. **"I have spent so many hours napping under this tree. Thinking. Climbing. Photographing. Making notes. Being with my tree. It's a very special tree, and it is a repository of so much time and so many memories and it will persist long after I do. And that's how it is with trees. I think that's why we care so much about them."** Listen to the full story at [nepr.net](http://nepr.net).

### Mass. Readies for Potentially Devastating Gypsy Moth Season

By Andrew Grant

May 24, 2017—Trees, which were weakened by the months-long drought that recently ended, are now facing a new peril: the return of the gypsy moth. While the moths may look like innocuous caterpillars, these invasive and voracious pests damaged more than 350,000 acres of forest last summer, the Massachusetts Division of Fisheries and Wildlife said. The moths begin to hatch in mid-May, eat almost continuously through July, and pose a very real risk to trees debilitated by drought, said Ken Gooch, forest health program director for the **Department of Conservation and Recreation**. **"The big problem is that they eat the foliage of trees, mainly oak. When they do that, the trees use their energy to make more leaves. That makes them vulnerable to other pests and things that actually kill the trees,"** said Gooch. Researchers have predicted that the damage could be even worse than last year, but this latest spell of wet, cold weather has bought the trees a much-needed reprieve, Gooch said. Read the full story at the [Boston Globe](http://BostonGlobe.com). (And [here](#) is one more from the *Globe* on gypsy moths.)

### Trees in Eastern U.S. Head West as Climate Changes

By Emma Marris

May 18, 2017—Ecologists have long predicted that climate change will send plants and animals uphill and towards the poles in search of familiar temperatures. Such movements have increasingly been documented around the world. But a study now shows that changing rainfall patterns may be driving some tree species in the eastern United States west, not north.

Songlin Fei, a forest ecologist at Purdue University in West Lafayette, Indiana, and his colleagues tracked the shifting distributions of 86 types of trees using **data collected by the US Forest Service's Forest Inventory and Analysis Program** during two periods: from 1980 to 1995 and between 2013 and 2015 for all states. They found more species heading west than north, probably partly because of changing precipitation patterns, the team reported on May 17 in *Science Advances*<sup>1</sup>. **"That was a huge surprise for us,"** says Fei. Read the full story at [Scientific American](http://ScientificAmerican.com).

### Trees on Newbury Greens May Be At Risk

By Jennifer Solis

May 24, 2017—A lack of adequate parking for people who want to boat in town is endangering a row of historic trees along the Lower Green. Meanwhile, an old, beloved tree on the Upper Green is slated for removal. Tree Warden Tim Lamprey recently told town officials that an overflow of vehicles and boat trailers seeking to use the town launch ramp are repeatedly parking along the green, which exposes tree roots and compacts the **soil. "This will, over time, lead to the death of the trees,"** Lamprey warned, adding that it was **"scary" to think** about all the activities that occur on the Lower Green and what might happen if limbs from dying trees started falling. Read the full story at [newburyportnews.com](http://newburyportnews.com).

### News Headlines in Brief

[Winds Topple Trees Planted By Robert Frost](#)  
[McMansions Are Killing the Los Angeles Urban Forest](#)  
[Microscopic Soil Creatures Could Orchestrate Massive Tree Migrations](#)  
[All the Trees Will Die, and Then So Will You](#)  
[Quantum Computer Learns to 'See' Trees](#)

# On the Horizon

- Jun 1 Urban Forestry Today Webcast: Climate Change, [www.joinwebinar.com](http://www.joinwebinar.com), enter the ID code: 811-772-323.
- Jun 3 NEC-ISA Master's Challenge Invitational Tree Climbing Competition, Attleboro, [www.newenglandisa.org](http://www.newenglandisa.org)
- Jun 3 ISA Certification Exam, Dighton, [www.newenglandisa.org](http://www.newenglandisa.org)
- Jun 4 Chainsaw Skills for Women, Sheffield, <http://www.thetrustees.org/>
- Jun 6 MTWFA Establishing Trees in Urban Environments, Andover, [www.masstreewardens.org](http://www.masstreewardens.org)
- Jun 6 FEMA Reporting Webinar, 4:00 p.m. (Eastern), Register [here](#).
- Jun 7 Tree City USA Forum and Award Ceremony, Arlington
- Jun 10 [Memorial Gathering for Tom Houston](#), 2:00 p.m., Memorial Hall, UMass Amherst
- Jun 14 Urban Forest Connections Webinar, 1:00 p.m. (Eastern) [www.fs.fed.us/research/urban-webinars/](http://www.fs.fed.us/research/urban-webinars/)
- Jun 15 Landscape Pests and Problems Walkabout - Insects, Weeds and Cultural Problems, Beverly, [www.umassgreeninfo.org](http://www.umassgreeninfo.org)
- Jun 20 Western Mass. Tree Wardens Dinner Meeting, Northampton, [www.masstreewardens.org](http://www.masstreewardens.org) or [info@masstreewardens.org](mailto:info@masstreewardens.org)
- Jun 21 TREE Fund Webinar, 2:00 p.m. (Eastern), <http://www.treefund.org/webinars>
- Jul 19 MNLA Down to Earth: Annual Summer Conference & Trade Show, Princeton, [www.mnla.com](http://www.mnla.com)
- Jul 9-15 [UMass Summer College Program in Sustainable Tree Care](#), contact [bkane@eco.umass.edu](mailto:bkane@eco.umass.edu).
- Jul 29-Aug 2 ISA Annual International Conference, National Harbor, MD, [www.isa-arbor.com](http://www.isa-arbor.com)
- Aug 2 Mass. Certified Horticulturalist Exam, Elm Bank, Wellesley, [www.mnla.com](http://www.mnla.com)
- Sept 21 Southeastern Massachusetts Tree Wardens Association Annual Field Day & Equipment Show, Plympton
- Sept 22-24 [Women's Tree Climbing Workshop](#), Petersham
- Sept 23 MA Town Forest Event, Sheffield
- Oct 13-14 MA DCR Tree Steward Training, Harvard Forest, Petersham. Save the Date!

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