Massachusetts Urban Forestry Program

The Citizen Forester

JANUARY 2012

Urban Tree Canopy and Your Community

An urban tree canopy (UTC) analysis can be an important tool for urban foresters to aid in planning where to strategically plant trees. The UTC can be defined as the parts of trees—leaves, branches, and stems— that are visible when seen from above. The tree canopy provides many benefits: intercepting rain water, cooling streets, reducing the formation of air pollutants, providing wildlife habitat, improving aesthetics, and many more.

A UTC analysis gives planners a picture of where there is existing UTC, where there is possible UTC (both in vegetated and impervious areas), and where it is not possible to increase UTC. It also determines how much UTC is present and possible, expressed as a percentage. With a concrete number, planners can set goals for future UTC and work toward meeting those goals. UTC analyses can be conducted at both small and large scales, giving planners information about the UTC in neighborhoods as well as a community as a whole.

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Many communities are unable to conduct UTC analyses in-house, so they often contract the analysis out. The Spatial Analysis Lab at the University of Vermont works with the Forest Service on UTC analyses; many private companies conduct analyses as well

Urban tree canopy assessments can be conducted using aerial and satellite images and geographic information systems (GIS) software. With aerial images, trees located in the shadows of buildings may not be visible, but canopy analyses conducted this way can be accurate and affordable for communities.

In recent years, LiDAR (light detection and ranging) has been used asses UTC. LiDAR data are obtained by aircraft flying overhead with global positioning equipment (GPS) and instruments that emit laser lights downward to detect distance. The result is a topographic map that can be used to extract tree canopy information. While highly accurate, obtaining LiDAR data can be expensive. Regardless of the type of image you use, a carefully done analysis from a high resolution image can provide accurate, reliable results.

In addition to the aerial or satellite image, a UTC requires some other data layers: land cover, building footprints, roads, rights of way, parcels, and geographic areas (neighborhoods, blocks, etc.). Additionally, other types of data may be included in an analysis, such as demographic data, that can aid in identifying environmental justice areas where planting could be prioritized.

Once the UTC analysis is complete, planners can objectively assess and prioritize planting activities to maximize benefits, such as improvements in water and air quality. Analyses that consider zoning and land use—residential (low, medium, high density), commercial, and industrial among others—can show planners what land uses support current UTC and which have the most potential to support more. For example, researchers have found that shoppers prefer spending time in areas with trees, so a community wishing to bolster a commercial district may consider planting trees as part of a revitalization program. A UTC analysis helps managers decide where they can prioritize planting to maximize benefits.

Fortunately, for urban forest managers, i-Tree, the free software developed by the Forest Service and partners, has a web-based canopy analysis tool that can provide a quick assessment of existing UTC in a community. All

Urban Tree Canopy (continued)

that is required is a web browser and an ESRI Shapefile to limit the geographic extent of the assessment. Once the Shapefile is uploaded, the program generates random points on a Google aerial image in the area the Shapefile delineated (i.e. a town boundary) and at the most basic level, the user assigns a value of "tree" or "non-tree" based on where the point is located. Users can input other categories, such as "vegetated" or "impervious" to get more detailed information from the assessment. The more points the user generates, the more accurate the assessment. A running UTC percentage and standard error are shown.

Many municipalities across the United States have turned to canopy analyses, not only for planning, but also as a public education tool with extensive websites and online tools. Montgomery County, Maryland has a Canopy Explorer Tool where users can delineate parcels or other areas to see canopy information. Many communities in Virginia have also conducted canopy analyses and the state maintains a website where users can access these as well as other links on UTC. Tools like these help residents understand the value of trees and can help gener-



Sample image from 4-band, multispectral image used in a UTC analysis in Ann Arbor, MI

ate community support for urban forestry.

UTC analyses have evolved in recent years and can be valuable tools for urban forest managers. An initial UTC assessment can serve as a baseline for future evaluations as communities monitor progress in improvements in tree canopy.

Picks and Shovels

The USDA Forest Service is doing extensive research on urban tree canopy assessments using LiDAR technology. For information on a Forest Service canopy project in New York and for more information on LiDAR see: http://nrs.fs.fed.us/urban/utc/

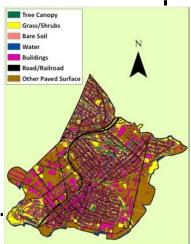
To conduct a quick assessment of canopy in your community using i-Tree Canopy, a free, web-based program, go to http://www.itreetools.org/canopy/index.php You will need an ESRI Shapefile (.shp) for your community.

For information on how an urban tree canopy analysis can help with strategic tree planting see the Summer 2011 issue of the USDA Forest Service Research Review available at http://nrs.fs.fed.us/news/review/13

To view a tree canopy analysis of Chelsea, MA done with aerial imagery check out www.fs.fed.us/nrs/utc/reports/UTC_Report_Chelsea.pdf

Recent UTC analyses from the Forest Service, see http://nrs.fs.fed.us/urban/utc/pubs/

Image from the 2002 UTC analysis of Chelsea, MA



Species Spotlight—Eastern hophornbeam Ostrya virginiana

Eastern hophornbeam is a native understory tree that commonly occurs in Massachusetts woodlands. It can grow 30-50 ft tall with a spread of 25-30 ft. It grows in USDA hardiness zones 4-9. As hophornbeams age, they



grow from a pyramidal form to a more rounded form. The leaves are alternate, doubly serrated and medium to dark green in color, changing

to yellow in the fall. The bark is scaly, peeling into vertical strips, providing year-round interest. The fruit is a small pod that grows in clusters that look like hops—hence the common name. The fruit offers food for birds

well as squirrels, rabbits, deer, purple finch, rose-breasted grosbeak, and downy woodpeckers.

Hophornbeam is at home in partial shade to full sun in sites away from roadside salts. It can tolerate a variety of soils and does best in sites that are not too wet. It has relatively few insect and disease prob-



lems.



This tree has recently popped up in yards in the Asian longhorned beetle regulated area in Worcester County as a species on the replanting list.

Boxwood Blight Detected in Connecticut

In October 2011, boxwood blight, a disease caused by the fungus *Cylindrocladium pseudonaviculatum* was identified in Connecticut—the first time the disease was recorded in the United States. Boxwood blight is also present in the Europe and New Zealand; it was first discovered in the United Kingdom in the mid-1990s, but was not identified until 2002.

All species of boxwood (*Buxus spp.*) are known to be vulnerable to the disease, however some species are more vulnerable than others. *Buxus sempervirens*, common or American boxwood is among the more vulnerable. According to the Connecticut Agricultural Experiment Station, the blight was detected in four counties: Fairfield, Hartford, Middlesex, and New London.

The blight impacts the boxwood above ground, in the leaves and stems. Dark lesions appear on the leaves (see picture at right) and these can grow larger, eventually causing the leaf to turn brown and drop off. Lesions also can appear on the stems. The fungus can

infect the leaf and stems directly, without using a wound as an entry point.

Young plants and recent transplants experiencing defoliation can eventually die following a repeated struggle to re-leaf.

Under damp conditions, the disease can quickly spread. The spores travel by air and water and can also be spread by animals, and people— on boots and clothing.

http://
extension.umass.edu/
landscape/news/
boxwood-blightfoundconnecticut

Photo: CT Agricultural Experiment Station



Job Opportunity

The University of Massachusetts Amherst is hiring an **Extension Assistant Professor** in Urban and Community Forestry. The position is a 12-month, nontenure track appointment with workload divided among teaching (20%), research (20%), and extension and outreach (60%). The candidate will teach two classes annually—one from existing curriculum in arboriculture and urban forestry and the other to complement other courses.

The candidate will develop and implement an integrated research and extension agenda including engaging university faculty, industry and government part-

ners in identifying, conducting and funding urban forestry research, education and extension/outreach; serving as a clearinghouse for research-based knowledge, ideas, information and techniques; engaging and involving partners and collaborators in the delivery of programs.

Application review will begin January 17.

http://eco.umass.edu/positions-in-eco/

Growing Greener—in Cambridge

The state's youngest urban foresters just may be in Cambridge. This past spring, the city introduced the Junior Forester Program for kids aged 5-13. About 25 eager participants signed up to adopt a street tree near their home or school.

The Urban Forestry Division trained the kids in the im-



portance of trees, how to measure moisture around tree roots with a moisture meter, how to weed and apply mulch, and how to water a street tree using a gator bag. The kids monitored the trees throughout the growing season. Following completion

of the program, they received a certificate and a patch.

Cambridge also revitalized a program for adults—evening neighborhood tree walks. While bad weather scuttled

one planned walk, Dave Lefcourt, city arborist, held two others in different parts of the city. Several residents attended the first walk in east Cambridge and spent an hour touring the trees. On the next walk, attendance increased five-fold, and residents toured the area around the main Cambridge library, and then walked to Harvard Yard, where they were met by Harvard's Director of Landscape Services who spoke about the trees in Harvard Yard. Residents gained an appreciation of trees in their community as well as had a great opportunity to interact with their city forester and learn about trees. For more information see www.cambridgema.gov/theworks

With sustained improvements like these in your community, you may be eligible for a Tree City USA Growth Award if your community is a current Tree City USA. Contact mollie.freilicher@state.ma.us for more information.

Growing on Trees—Grant Writing

Thinking about applying for a DCR Urban Forestry Challenge Grant or other grant, but feeling overwhelmed by the grant-writing process? Want to apply, but you have no experience writing grants? Check out the Alliance for Community Trees' website on grant writing http://www.treelink.org/grants/index.phtml

Here you'll find helpful advice on overcoming initial anxiety, basics of grant writing, keys to success, as well as other resources available on the internet.

Growing on Trees—Scholarships

Garden Club of America Zone VI Fellowship in Urban Forestry

This scholarship is open to advanced undergraduate students and graduate students studying environmental studies, horticulture, forestry, and other courses of study that relate to the urban forest.

The purpose of this award is to encourage students to study urban forest horticulture, planning, and management and the impacts of urban forests.

The award is \$4,000 for study and research that will advance knowledge of urban forestry. Recipients must be enrolled in the academic year of the fellowship.

Applicants should complete either the graduate applica-

tion or the undergraduate application and include a signed letter of recommendation from the student's faculty advisor.

Application deadline is January 31, 2012.

For more information see the Garden Club of America website:

http://urbanforestry.frec.vt.edu/scholarship/index.htm

or contact Dr. Eric Wiseman, Department of Forest Resources and Environmental Conservation, Virginia Tech, 228 Cheatham Hall, Blacksburg, VA 24061-0324. Phone: (540) 231-5148, Email: gcaurbanforestry@vt.edu

New England Chapter ISA Scholarships

The New England Chapter of the International Society of Arboriculture offers two scholarships to students enrolled at an accredited 4-year college, 2-year college, or university in Connecticut, Maine, Massachsuetts, New Hampshire, Rhode Island, or Vermont.. The student may also be a resident of one of the above states, but attends an accredited 4-year, 2-year, or university elsewhere.

The applicant must be a student member of the New England Chapter ISA (at the time of application or upon receipt of award). The course of study for the applicant must be related to plant materials: arboriculture, botany,

entomology, horticulture, plant pathology, urban forestry, or a related field. One semester of courses toward a degree in a plant-related field must have been completed at the time of application.

Deadline for application is **April 8, 2012**.

For more information see the NEC-ISA website: http://www.newenglandisa.org/scholarships.html or contact Jennifer Kettell, NEC-ISA Secretary and Scholarship Chair, Arnold Arboretum I25 Arborway, Boston, MA 02130

On the Horizon

January 11-12 99th Annual Conference of the

Massachusetts Tree Wardens and Foresters Association, Sturbridge www.masstreewardens.org

February I-3 New England Grows, Boston

Convention and Exhibition Center www.newenglandgrows.org

March 13 UMass Community Tree Conference,

New Research - New Insects & Diseases

- A New Safety Standard - A Reality

Check

Stockbridge Hall, Amherst http://extension.umass.edu/

April 7 ISA Exam, Amherst, MA (registration

deadline March 22) www.isa-arbor.org

April 13 MCA Exam

www.massarbor.org

May I Deadline for DCR Urban and

Community Forestry Challenge Grants

www.mass.gov/dcr

Tree City USA Applications were due December 31

Please submit your application ASAP

Bureau of Forestry

Department of Conservation and Recreation

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Deval Patrick, Governor

Timothy Murray, Lieutenant Governor

Richard Sullivan, Secretary, Executive Office of Energy and Environmental Affairs

Edward M. Lambert, Jr., Commissioner, Department of Conservation and Recreation

Peter Church, Director of Forest Stewardship, Department of Conservation and Recreation

The Citizen Forester is made possible through a grant from the USDA Forest Service Urban and Community Forestry Program and the Massachusetts Department of Conservation and Recreation, Bureau of Forestry.

If you have a topic you'd like to see covered or addition to the Citizen Forester newsletter (photo, event, etc.), please let us know.

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