UNDERSTANDING URBAN FORESTS AND THEIR ROLE IN COMMUNITY VIABILITY

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VirginiaTech
College of Natural Resources and Environment

Virginia Cooperative Extension
Virginia Tech • Virginia State University

"Benefits of Urban Forests"

American Forests

http://tinyurl.com/AFtreeben

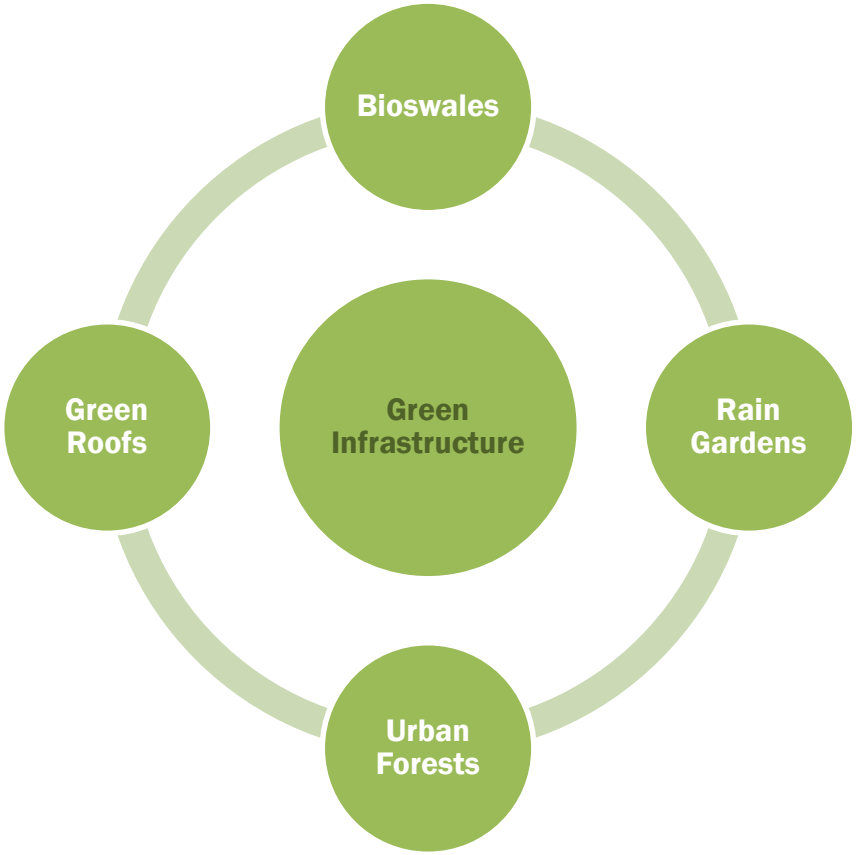
PRESENTATION OVERVIEW

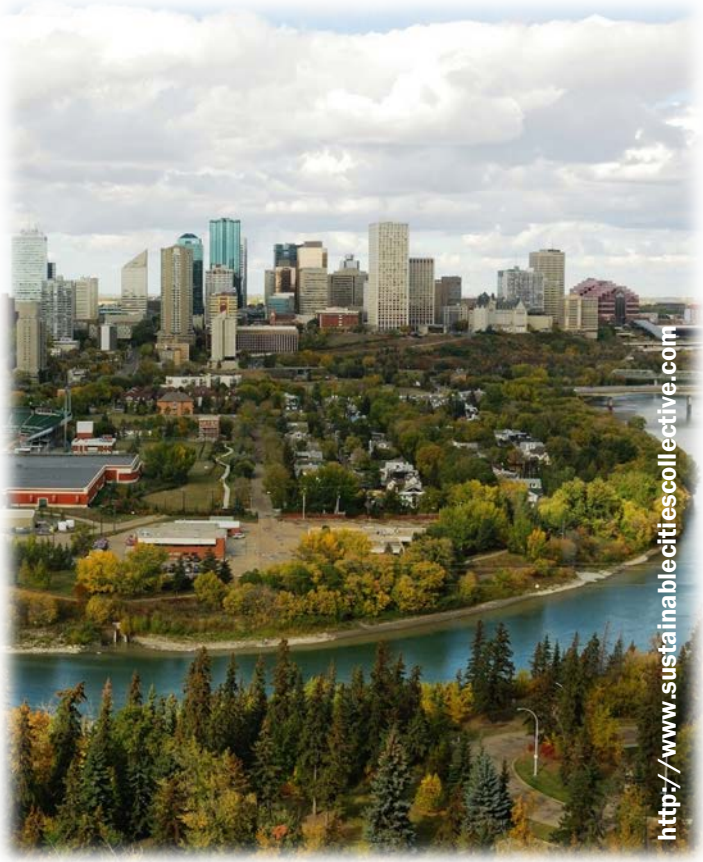
- What is an urban forest?
- How do urban forests contribute to community viability?
- How are urban forests planned?
- What specialized knowledge and skills do urban foresters contribute to planning?
- Discussion of intersection between urban forestry and urban planning

WHAT IS AN URBAN FOREST?

"The sum of all woody and associated vegetation in and around dense human settlements, ranging from small communities in rural settings to metropolitan regions."

~ Miller, Hauer, & Werner (2015). Urban Forestry: Planning and Managing Greenspaces





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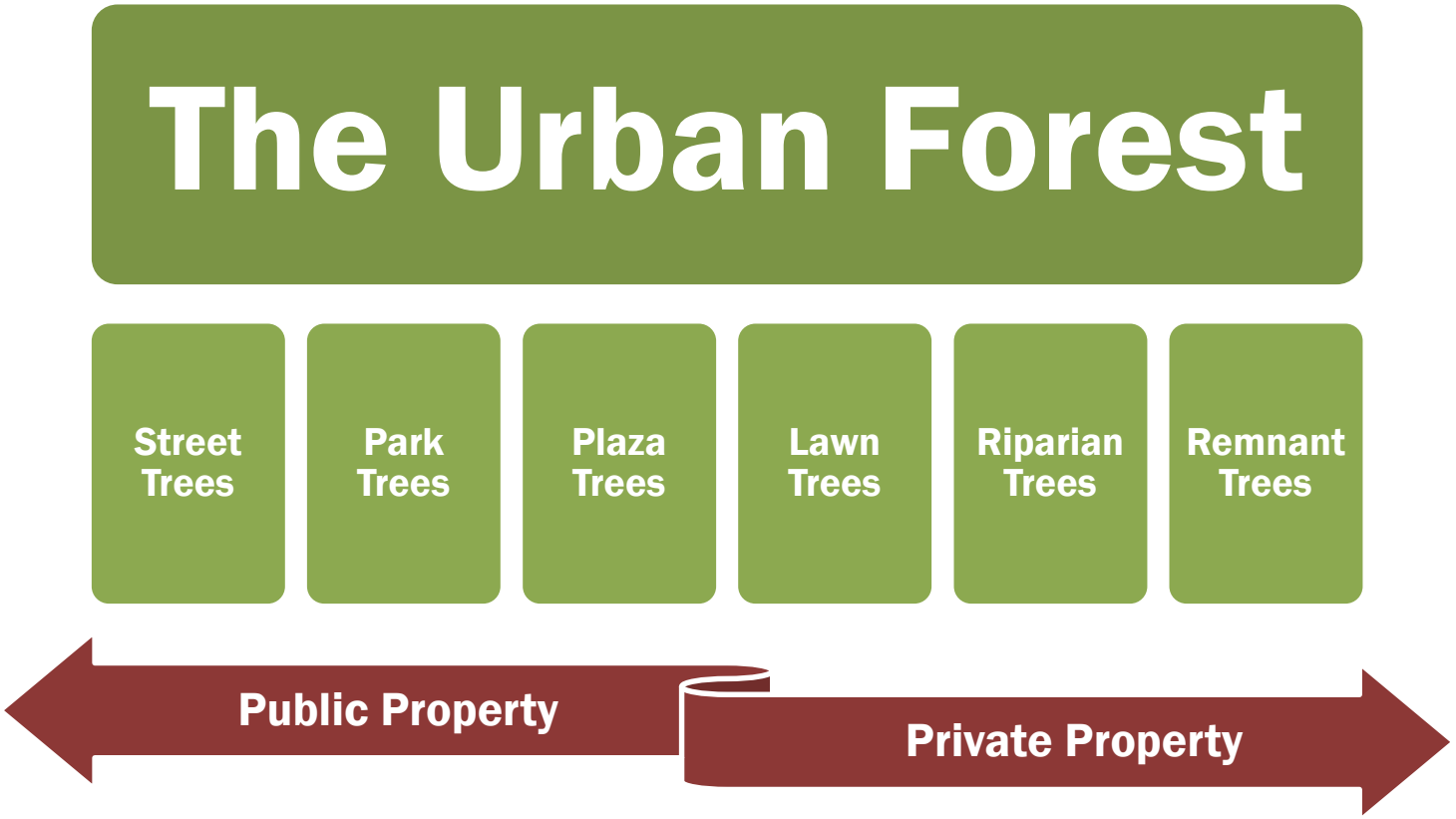

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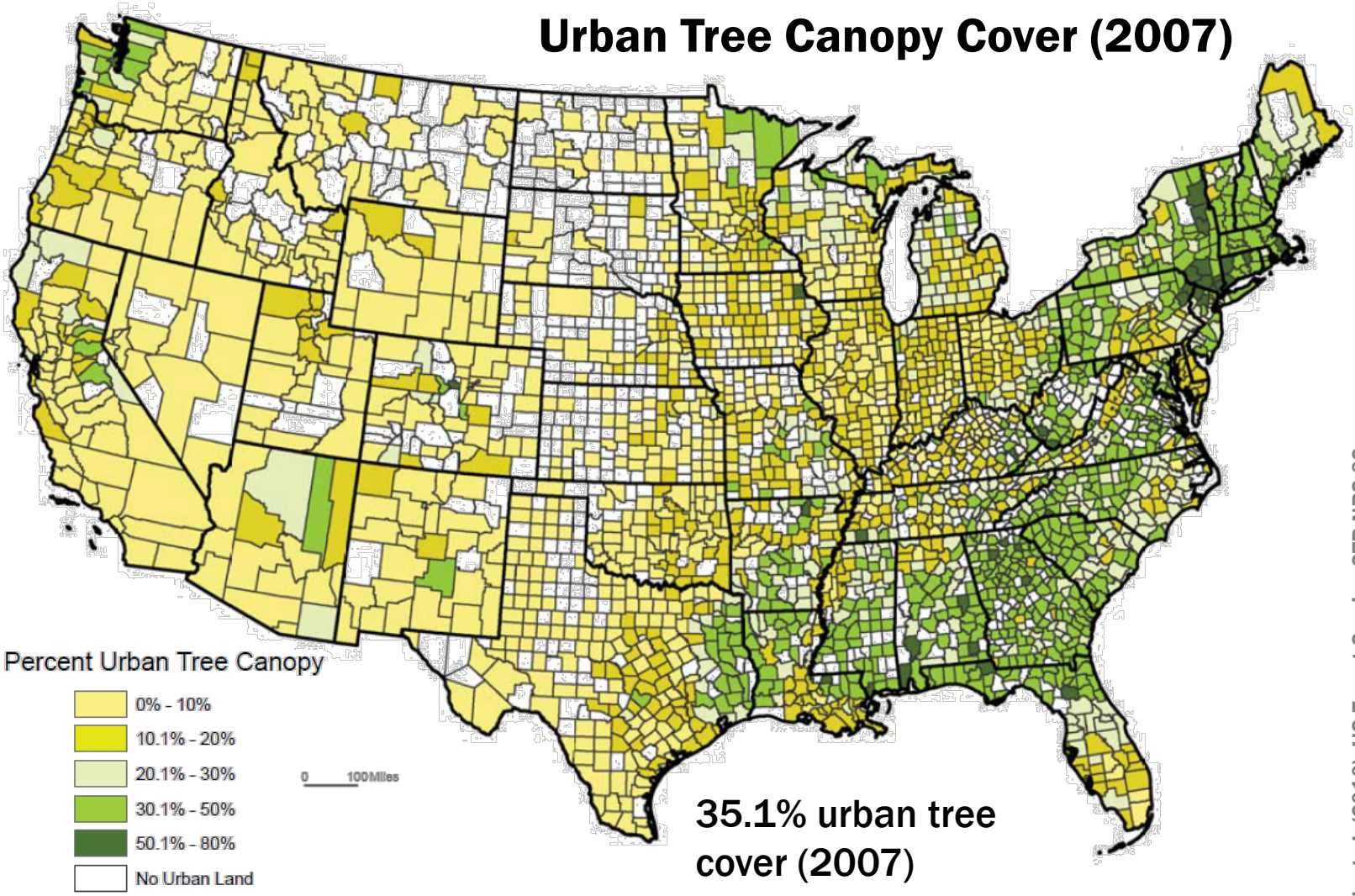


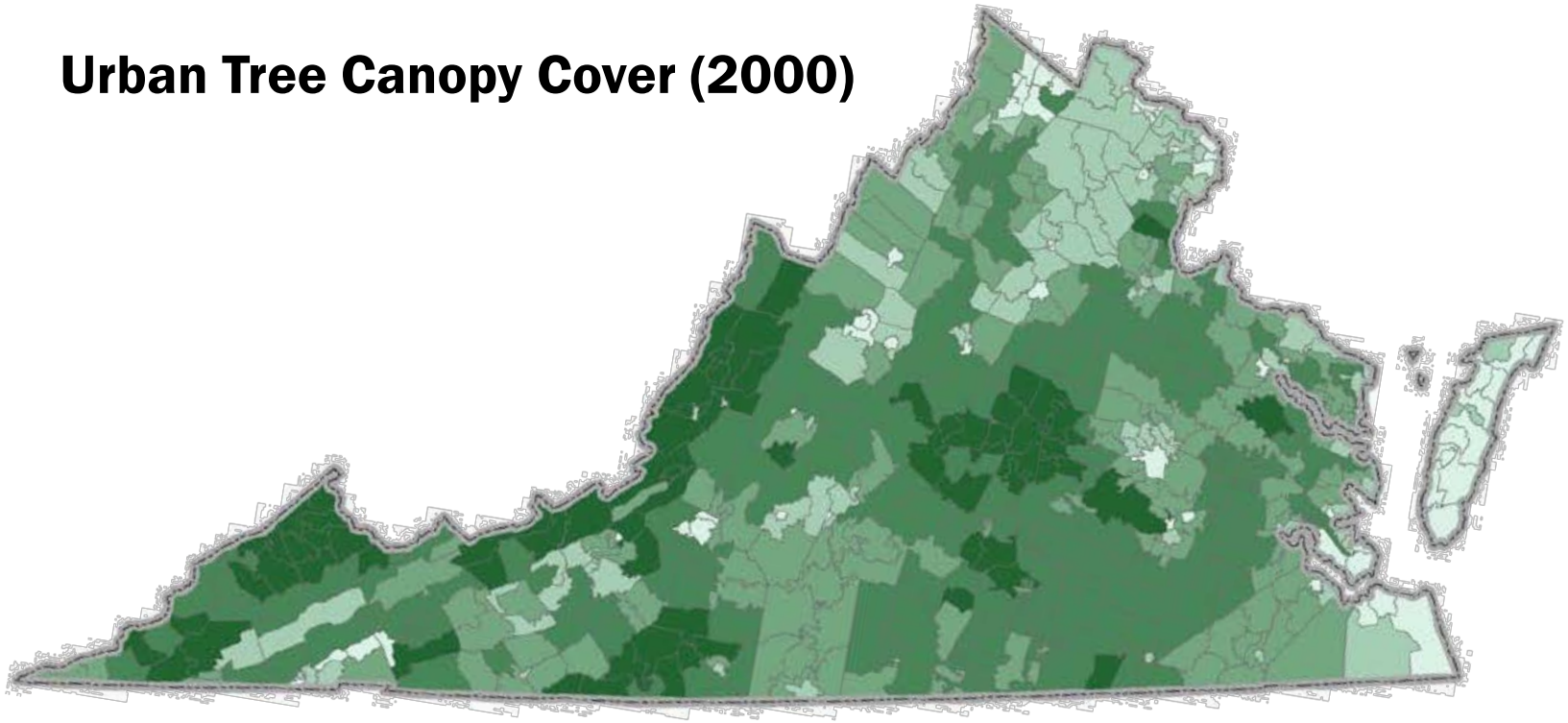
35.1% urban tree cover (2007)

3.8 billion trees (2001)

Source: Nowak et al. (2010). US Forest Service GTR NRS-62.

WHAT IS AN URBAN FOREST?

Urban Tree Canopy Cover (2000)



Percent

- 7.5% - 28%
- 28.1% - 43.3%
- 43.4% - 55.2%
- 55.3% - 65.4%
- 65.5% - 81.2%

34.7% urban tree cover (2000)

85.3 million trees (2000)

Source: Nowak & Greenfield (2009). US Forest Service GTR NRS-50.

WHAT IS AN URBAN FOREST?

U.S. Cities Are Losing 4 Million Trees a Year

Tree coverage is steadily shrinking in urban America, according to a new study of aerial photos.

From *The Atlantic* CITYLAB

ERIC JAFFE | @e_jaffe

| Feb 9, 2012 |

Tree and impervious cover change in U.S. cities

David J. Nowak*, Eric J. Greenfield

USDA Forest Service, Northern Research Station, 5 Moon Library, SUNY-ESF, Syracuse, NY 13210, United States

Urban Forestry & Urban Greening 11 (2012) 21–30

Tree cover in 17 of the 20 analyzed cities had statistically significant declines in tree cover, while 16 cities had statistically significant increases in impervious cover. ... City tree cover was reduced, on average, by about 0.27 percent/yr, while impervious surfaces increased at an average rate of about 0.31 percent/yr.

Source: http://www.citylab.com/weather/2012/02/us-cities-are-losing-4-million-trees-year/1183/

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Despite various and likely limited tree planting and protection campaigns, tree cover tends to be on the decline in U.S. cities while impervious cover is on the increase. While these individual campaigns are helping to increase or reduce the loss of urban tree cover, more widespread, comprehensive and integrated programs that focus on sustaining overall tree canopy may be needed to help reverse the trend of declining tree cover in cities. ... Developing coordinated healthy tree canopy programs across various land ownerships can help sustain desired tree cover levels and better manage cover change.

Source: http://www.citylab.com/weather/2012/02/us-cities-are-losing-4-million-trees-year/1183/

URBAN FORESTS & COMMUNITY VIABILITY

"Urban forests contribute to the livability and sustainability of communities."

STORMWATER MITIGATION

Source: https://www.arborday.org/trees/stormwater.cfm

URBAN FORESTS & COMMUNITY VIABILITY

"Urban forests contribute to the livability and sustainability of communities."

URBAN HEAT ISLAND MITIGATION

Just three trees, properly placed around a house, can save up to 30% of energy use. *(U.S. Forest Service Center for Urban Forest Research)*

Source: https://www.arborday.org/trees/climatechange/heatisland.cfm

URBAN FORESTS & COMMUNITY VIABILITY

"Urban forests contribute to the livability and sustainability of communities."

PUBLIC HEALTH

The Atlantic | JAMES HAMBLIN | JUL 29, 2014 | HEALTH

The Health Benefits of Trees

They prevent $7 billion in health costs every year by filtering air pollution—not to mention their psychological effects. New research says the closer you can live to trees, the better off you are.

In the current journal *Environmental Pollution*, forester Dave Nowak and colleagues found that trees prevented 850 human deaths and 670,000 cases of acute respiratory symptoms in 2010 alone. That was related to 17 tonnes of air pollution removed by trees and forests, which physically intercept particulate matter and absorb gasses through their leaves.

Source: http://www.theatlantic.com/health/archive/2014/07/trees-good/375129/

URBAN FORESTS & COMMUNITY VIABILITY

"Urban forests contribute to the livability and sustainability of communities."

REAL ESTATE VALUE

Trees in the city: Valuing street trees in Portland, Oregon

Geoffrey H. Donovan[a,*], David T. Butry[b]

[a] *Pacific Northwest Research Station, Portland Forestry Sciences Laboratory, P.O. Box 3890, Portland, OR 97208, United States*
[b] *Building and Fire Research Laboratory, National Institute of Standards and Technology, Gaithersburg, MD 20899, United States*

Landscape and Urban Planning 94 (2010) 77–83

"On average, street trees add $8,870 to sales price and reduce time-on-market (TOM) by 1.7 days."

Source: http://www.fs.fed.us/pnw/pubs/journals/pnw_2010_donovan001.pdf

URBAN FORESTS & COMMUNITY VIABILITY

"Urban forests contribute to the livability and sustainability of communities."

COMMERCE

Business Districts: Increased Sales, Desirability and Rents

- Shoppers will travel further and longer to visit a district with high quality trees, and spend more time there once they arrive. [45]
- People have more favorable perceptions of communities with green roads. [46]
- Visitors to well-treed central business districts will spend 9 to 12 percent more for products. [46]
- People will pay higher prices for goods in green communities. For instance, in one study, sports shoes were priced 7% higher in the green setting, and a sit-down dinner or a flower bouquet were 10% higher. [47]
- A study found 7% higher rental rates for commercial offices having high quality landscapes. [44]

Jobs

- In California in 2009, urban forestry supported 60,067 jobs, resulting in $3.3 billion in individual income, $826 million of Local, State, and Federal taxes, and added $3.5 billion in values to CA's economy. [7]
- The environmental horticultural industry—including all businesses and government units involved in distributing, installing, and maintaining plants, landscapes, trees, and related equipment—in 2002 was estimated at $147.8 billion in output, 1,964,339 jobs, $95.1 billion in value added, and $64.3 billion in labor income. [99]

Source: http://www.actrees.org/files/Research/benefits_of_trees.pdf

URBAN FORESTS & COMMUNITY VIABILITY

"Sustainable, high-value urban forests requires understanding of costs."

- **Planting and maintenance costs**
- **Infrastructure conflicts and damage**
- **Loss of functional space**
- **Safety and security issues**
- **Unwanted shade and wildlife**
- **Allergies and debris**
- **Removal and disposal costs**
- **Liability settlements**

*"The average annual **net** benefit of a mature large tree is $85 in a yard and $113 on public land."*

~ McPherson et al. (2007). Northeast Community Tree Guide: Benefits, Costs, and Strategic Planting. US Forest Service PSW-GTR-202.

"Whether urban forests are an asset or a liability depends largely on their planning and management."

PLANNING URBAN FORESTS

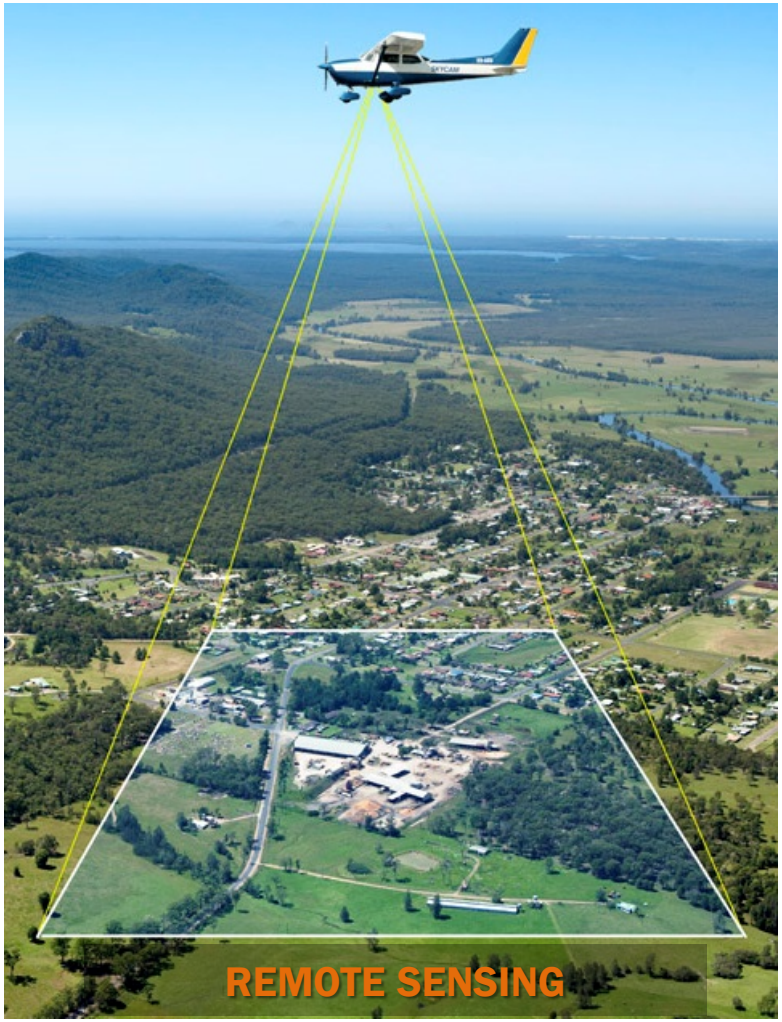
"Urban forests are the result of a community vision and thoughtful planning."

PLANNING URBAN FORESTS

"Assessment tells us the quantity, quality, and distribution of the resource."

Bottom-Up Approach

Top-Down Approach



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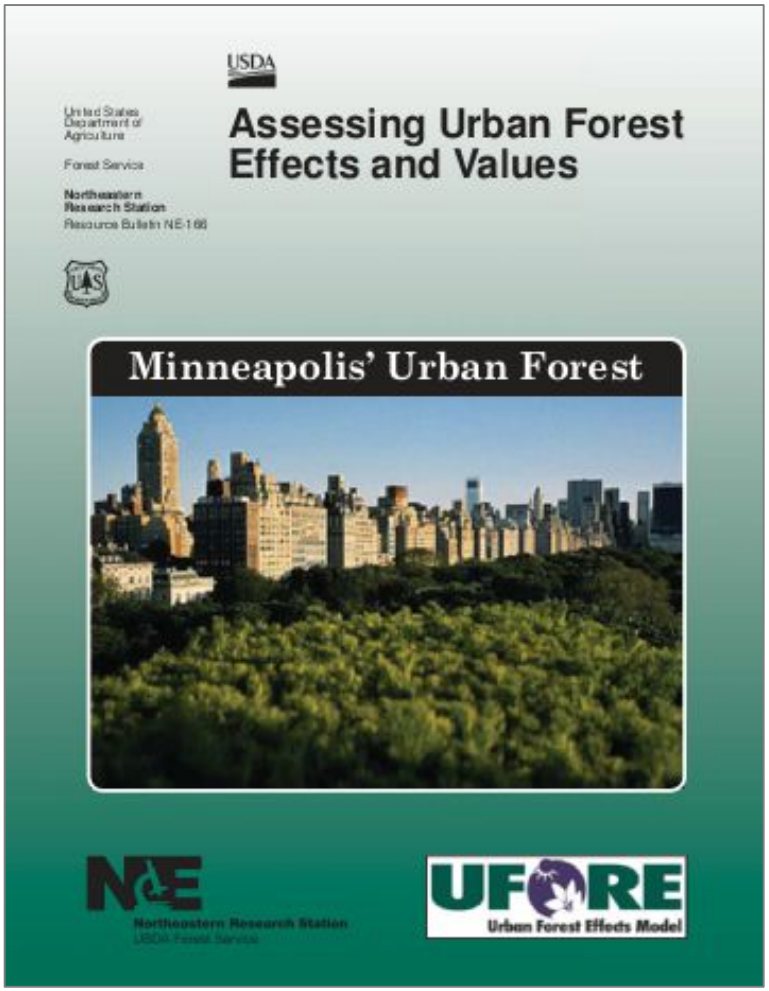
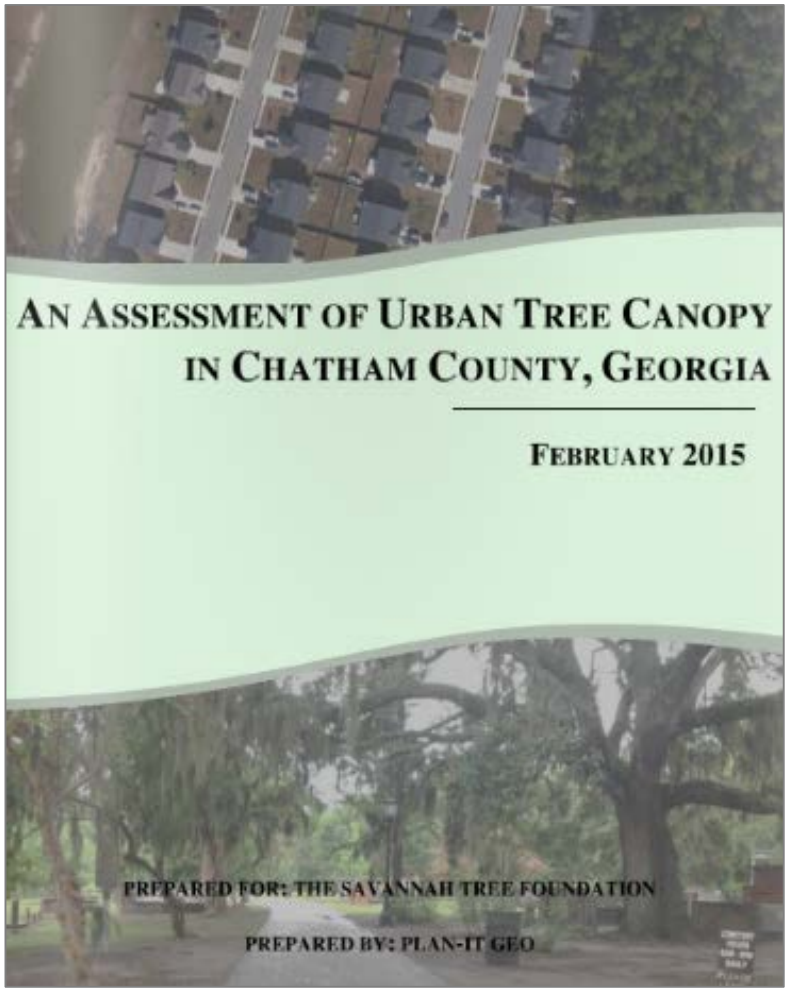


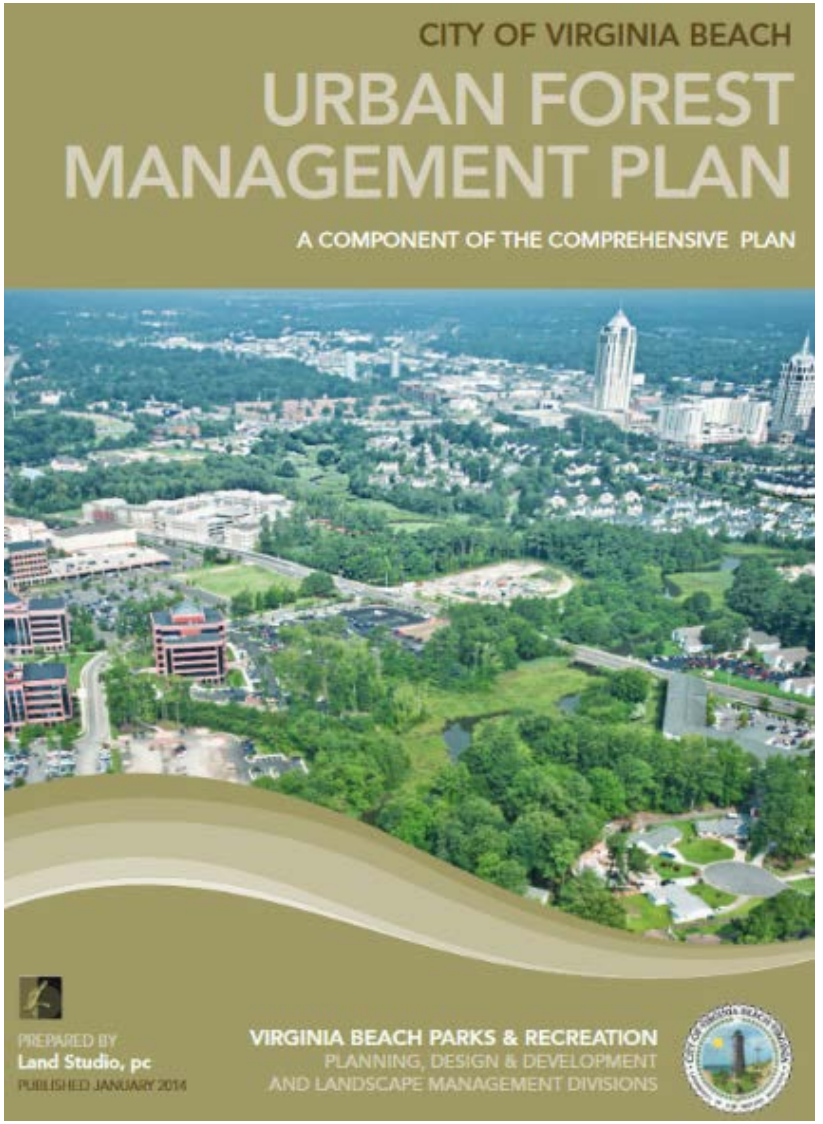
Top-Down Approach



PLANNING URBAN FORESTS

"The plan addresses the forest, the community, & the management approach."

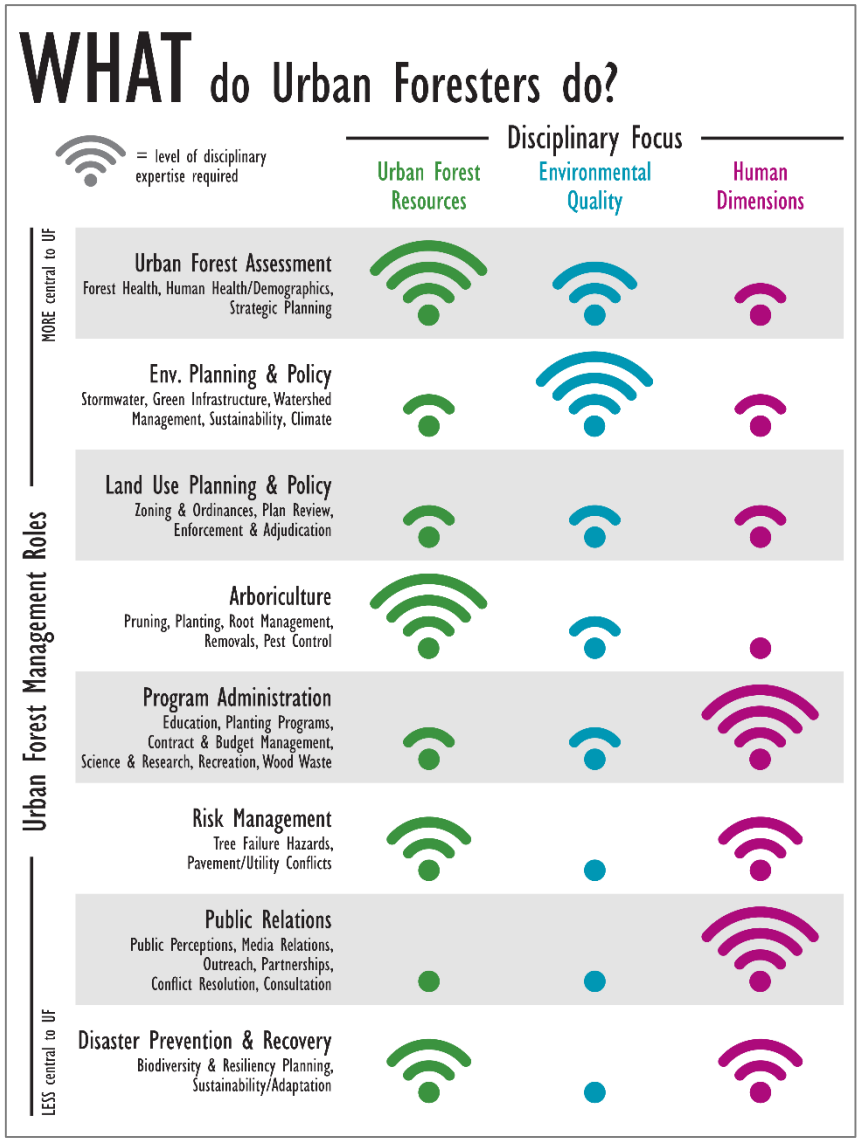
- **The forest**
  - Canopy cover
  - Age and species diversity
  - Geographic distribution
- **The community**
  - Municipal leadership
  - Commercial buy-in
  - Neighborhood action
- **The management approach**
  - Funding
  - Staffing
  - Policies
  - Practices



PLANNING URBAN FORESTS

"Urban foresters contribute unique expertise to urban forest planning."

- **Forest Assessment**
  - Composition & condition
  - Conservation priority
- **Site Evaluation**
  - Growing conditions
  - Use compatibility
- **Tree Protection**
  - Low impact development
- **Tree Selection**
  - Ecosystem services
- **Disaster Preparedness**
  - Canopy restoration
  - Debris utilization



URBAN FORESTRY & URBAN PLANNING

"Urban forests are critical to community viability and rely on thoughtful planning and implementation by a team of professionals."

- **A positive achievement you have experienced with urban forest/green infrastructure planning.**
- **Where do you go for information and technical assistance with urban forest/green infrastructure planning?**
- **A key opportunity to improve urban forest/green infrastructure planning in Virginia.**

QUESTIONS & COMMENTS

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