

USDA Forest Service

# URBAN FOREST CONNECTIONS

*webinar series*

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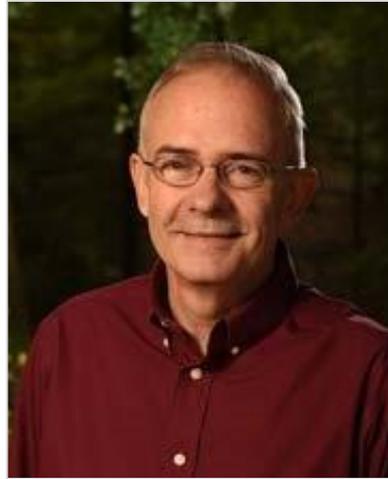


# NUCFAC HIGHLIGHTS: CLIMATE CHANGE IMPACTS AND ADAPTIVE STRATEGIES



**Lance Davisson**

*Chair  
National Urban and Community  
Forestry Advisory Council*



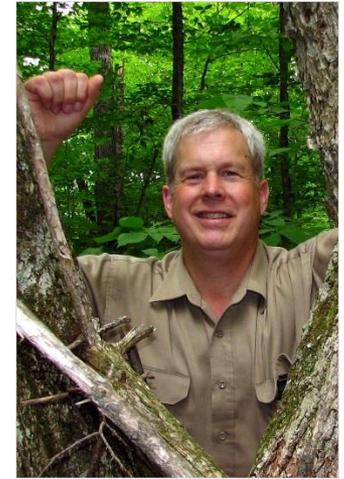
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*Research Forester  
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**Andy Whitman**

*Director, Sustainable  
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Manomet*

# Manomet's *WeatherWise* Workbook

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Ethel Wilkerson



USDA Forest Service

UrbanForest

Connections

*webinar series*

July 13, 2016

Brunswick ME



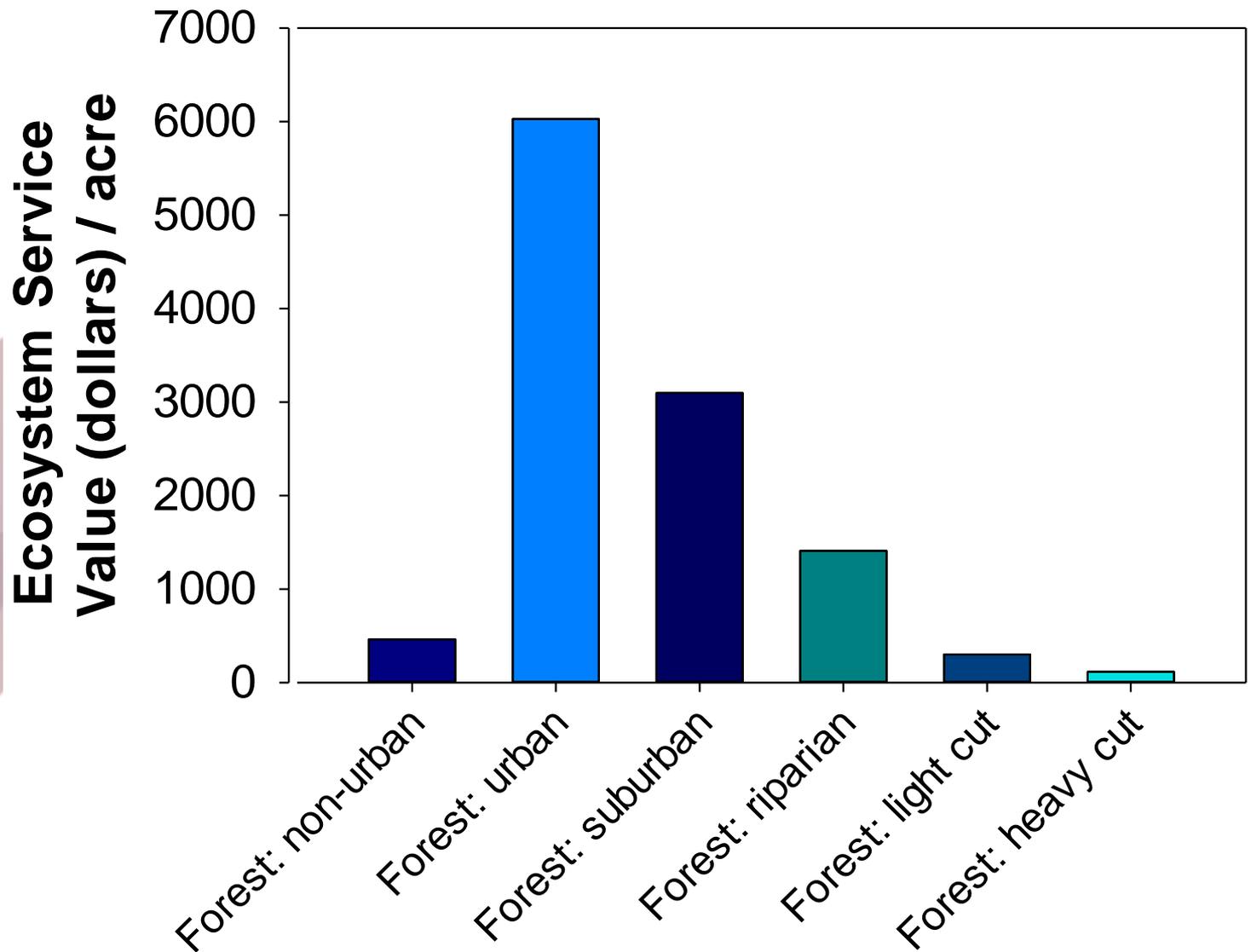
## Urban areas drive the economy<sup>1</sup>

- 81% of population, increasing faster rural areas
- 12% of land area
- 65% of jobs
- 75% of GDP
- >75% of infrastructure

<sup>1</sup> U.S. Census. 2010.



## NE Urban forests have high value<sup>2</sup>



<sup>2</sup>Troy, A. 2012. Valuing Maine's Natural Capital. Manomet Center for Conservation Sciences, Brunswick, ME.

# Key Threats to urban/community forests<sup>3</sup>

- Variable weather (e.g. climate change)
- Exotic pest species (e.g. EAB, ALB, HWA)
- Invasive plant species
- Increasing development (e.g. intensification and sprawl)
- Declining budgets

<sup>3</sup>[Nowak, D.J. et al. 2010. Sustaining America's urban trees and forests: a Forests on the Edge report. Gen. Tech. Rep. NRS-62. USDA, Forest Service, 27 p.](#)

Whitman, A. and R. Wynne. (unpublished). Threats to urban and community forests in Sagadahoc County, Maine. Manomet. Brunswick, ME.



## Urban forest and climate change<sup>4</sup>

Factor	Impact
Increased temperatures	<ul style="list-style-type: none"><li>• Greater numbers of tree pests and pathogens</li></ul>
Increased winter temperatures	<ul style="list-style-type: none"><li>• More frequent winter kill (freezing and thawing)</li></ul>
More frequent summer drought	<ul style="list-style-type: none"><li>• Aggravated by urban soil compaction &amp; impermeable surfaces</li><li>• Urban foliage more attractive to pests and pathogens</li></ul>
Increased winter precipitation	<ul style="list-style-type: none"><li>• Damage due to increased snow and ice loading</li></ul>
More frequent extreme weather	<ul style="list-style-type: none"><li>• More uprooted trees</li><li>• Root damage from waterlogging</li></ul>

**Change Very likely - Timing and magnitude is uncertain.**

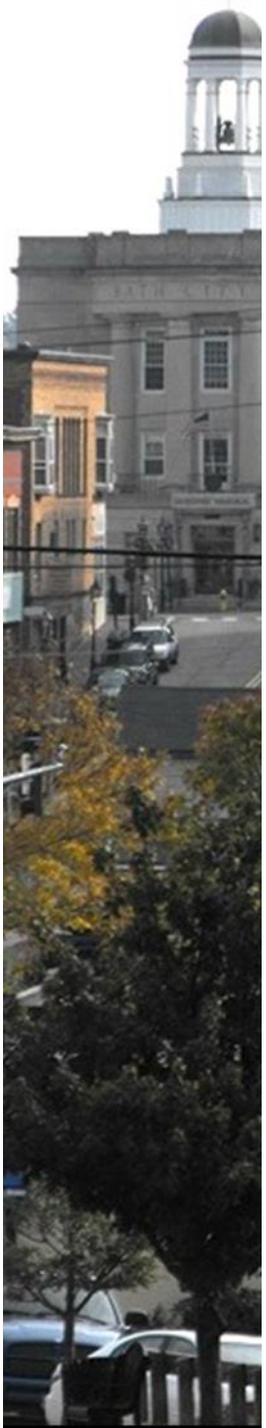
<sup>4</sup> [Whitman, A., et al. 2013. Climate Change and Biodiversity in Maine: Vulnerability of Habitats and Priority Species. Manomet. Report SEI-2013-03. Brunswick, ME.](#)

## Community forest & climate change<sup>5</sup>

Forest Type	Impacts under low and high emission scenarios
Spruce - fir forests	Low: Modest widespread decline and loss. High: Decline everywhere and greatest in southern and central Maine
Northern hardwood	Low: Some increased forest productivity. High: Some decline widespread.
Hemlock	Hemlock woolly adelgid results in widespread loss.
Oak and pine	Widespread expansion, especially of pine
Swamp	Localized but widespread decline or loss due to drought and SLR

**Change Very likely - Timing & magnitude is uncertain.**

<sup>5</sup> [Whitman, A., et al. 2013. Climate Change and Biodiversity in Maine: Vulnerability of Habitats and Priority Species. Manomet. Report SEI-2013-03. Brunswick, ME.](#)



## Urban Forests can reduce impacts<sup>6</sup>

- Moderate storm damage/impacts
- Moderate temperatures (e.g., for homes, heat island effect)
- Reduce peak water flows & flooding
- Absorb air pollution
- Keep sediment out water bodies
- Maintain community attractiveness
- Altered composition and ages to increase resiliency to pests
- Soften visual impacts of intensification and sprawl
- Provide wildlife habitat

<sup>6</sup> [Whitman, A. and E. Wilkerson. 2015. \*Increasing the Resiliency of Forests in New England. The Weather-Wise Workbook for Urban and Rural Forests.\* Brunswick, ME.](#)

# The WeatherWise Workbook<sup>7</sup>

Five worksheets for:

- Urban forest plans
- Land use planning and ordinances
- Land trust & community forest plans
- Suburban & rural landowners



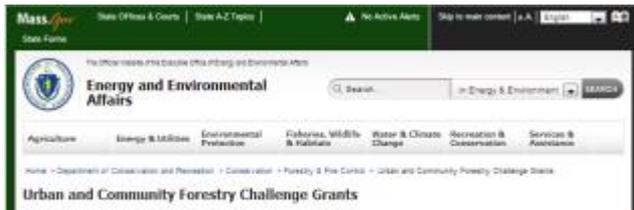
<sup>7</sup> [Whitman, A. and E. Wilkerson. 2015. \*Increasing the Resiliency of Forests in New England: The Weather-Wise Workbook for Urban and Rural Forests\*. Brunswick, ME.](#)

# WeatherWise Worksheets<sup>8</sup>



# 1. Prepare for Change

- General knowledge about climate change
- State and local information about potential threats



Urban and Community Forestry Challenge Grants

With support from the USDA Forest Service, the Massachusetts Urban and Community Forestry and Community Forestry Challenge Grant. These are 50-60 matching grants for and non-profit groups in Massachusetts communities of all sizes for the purpose of building excellent urban and community forestry at the local and regional level. This grant offering is a continuation of our previous grant opportunities (State Forest, Planning and Education). We have changed the format in an effort to streamline the grant process for applicants and limited resources.

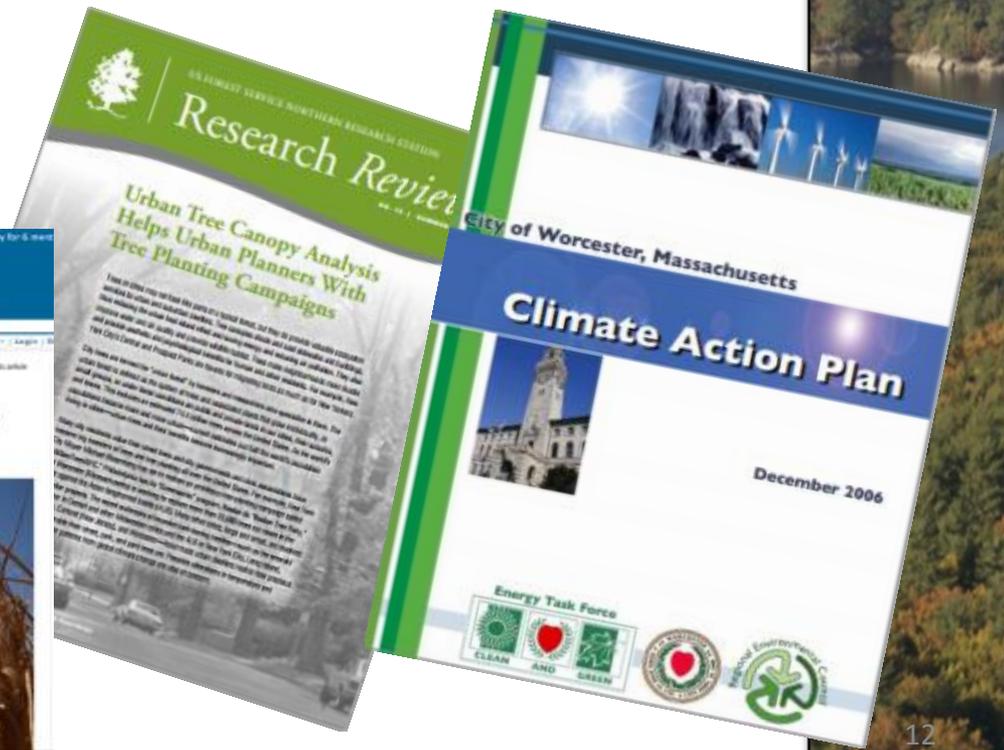
What is Urban and Community Forestry?

For the purposes of these grants, Urban and Community Forestry refers to professional management and maintenance of a municipality's public tree resources in partnership with community institutions. On a broader scale, Urban and Community Forestry involves the management of all a municipality's or region's "green infrastructure" in order to maximize environmental quality. For a more detailed description [click here](#).

What Makes a Strong Urban and Community Forestry Program?

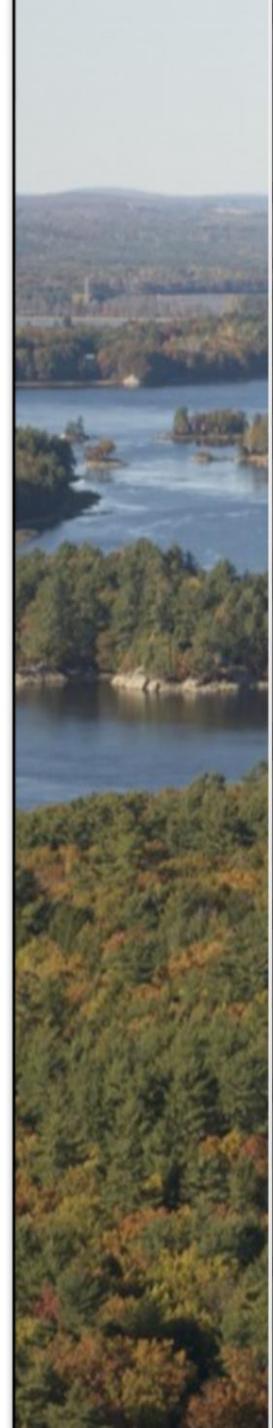
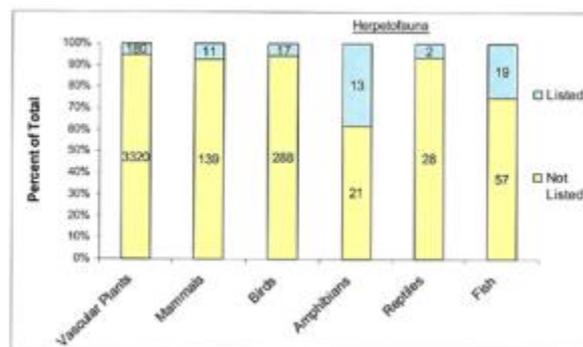
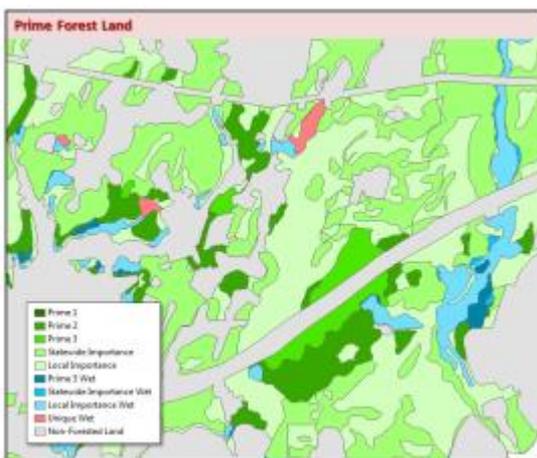
Step 1: Intent to Apply. If you or your organization is considering applying for this grant, visit Intent to Apply Form. You may submit an intent to apply any time during the year, and do so with you on your list. Final full proposals are due twice a year: May 1 and November 1. Forms must be received at least one month in advance of these deadlines, and preferably 45 days ahead of the deadline.

- [Intent to Apply Form](#)
- [Urban & Community Forestry Grant Application](#)
- [Sample Request for Proposal](#)



## 2. Plan for Change

- Management goals and objectives
- Location information
- Protection and maintenance activities
  - e.g., identify at-risk protection and maintenance
- Area descriptions and inventory
  - e.g., identify vulnerable parks, neighborhoods and stands



# Planning tools – i-Tree Suite<sup>6</sup>

Program	Description
<i>Canopy</i>	Tree canopy cover, area of cover types, and key benefits in Google Earth.
<i>Design</i>	Tree benefits and ideal planting zones in Google Earth and mitigate threats.
<i>Eco</i>	Uses your inventory data to quantify forest structure, key benefits, and threat impact.
<i>Vue</i>	Estimates cover types and some forest benefits urban, community, and private forests.

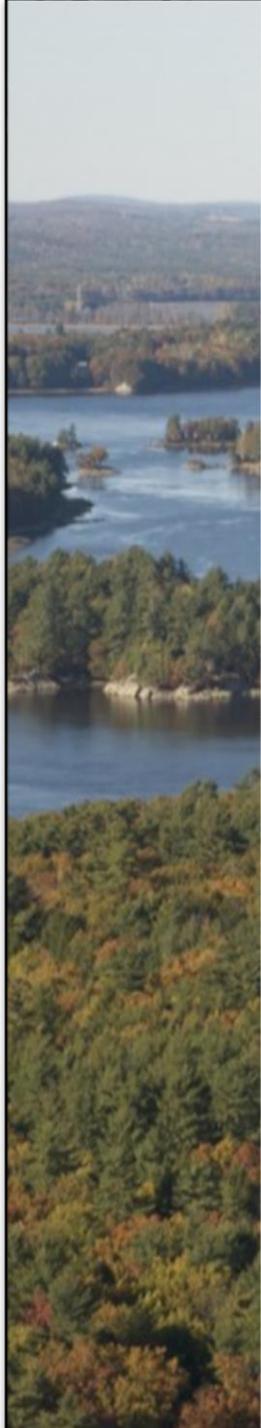
<sup>6</sup> [www.itreetools.org/](http://www.itreetools.org/), e.g., Whitman, A. and R. Wynne. 2014. Using i-Tree Canopy to Rapidly Assess the benefits of Local Forests: A Case Study from Bath, ME. Manomet, Brunswick, ME



# 3. Apply Key Strategies & BMPs

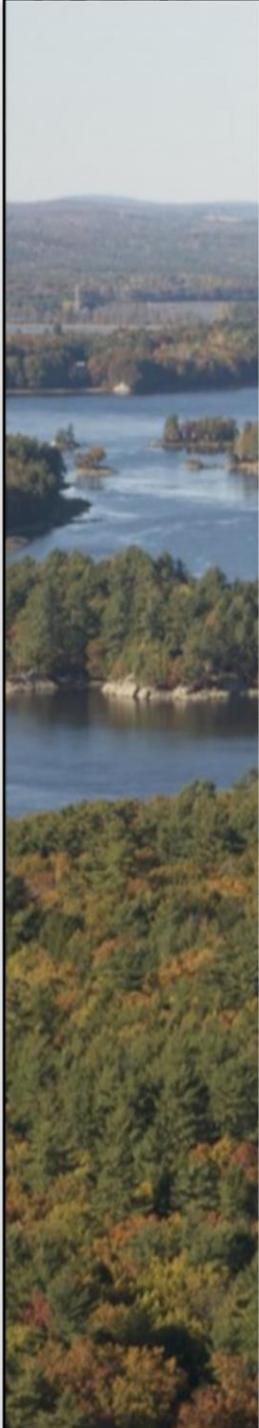
## *Examples:*

- Forest Health and productivity
  - Plantings or regenerate (saplings) of climate “winners”
- Wildlife Habitat
  - Maintain forest habitat connectivity
- Carbon storage
  - Minimize stand damage when harvesting timber
- Water Quality
  - Minimize disturbance to water bodies & wetlands
- Human safety and health
  - Manage wildfire risk appropriately
- Recreation
  - Monitor and repair trails after large storms



# 4. Monitor and Adjust

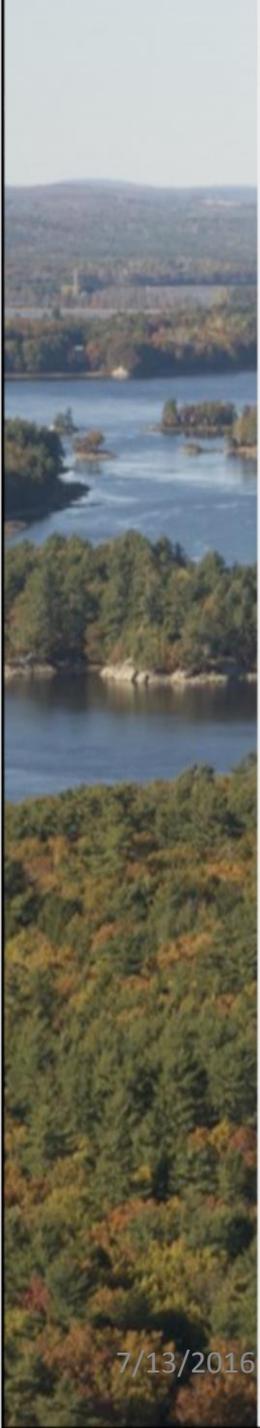
- Have simple and effective ways to monitor forest health
- Have an efficient monitoring system for Infrastructure
- Adjust management strategies to respond to existing and emerging threats



# Key workbook themes

- Focus on goals & objectives
- Prepare for greater uncertainty and more frequent, extreme events
- Increase forest resiliency
  - Exotic species mgt.
  - Roads and stream crossings
  - Likely climate change “winners” and “losers”
- Adjust to changing conditions
- Use no-regret BMPs (apply good forestry)





## Summary

- Urban forests are key assets
- Urban forests are vulnerable
- The *WeatherWise Workbook* can help communities use urban forests to increase their resiliency in a changing world

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<https://www.manomet.org/program/sustainable-economies/creating-resilient-urban-and-community-forests>

# Acknowledgements

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