



Climate Change Planning at Regional and Local Level:

A Focus On Conservation



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Metropolitan Area Planning Council STRATEGIC PLAN 2015–2020

November 2014

Encourage development and preservation consistent with **SMART GROWTH PRINCIPLES**.

Partner with our cities and towns to **PROMOTE REGIONAL COLLABORATION**, enhance **EFFECTIVENESS**, and increase **EFFICIENCY**.

Play a leading role in helping the region to achieve greater **EQUITY**.

Help the region reduce greenhouse gas emissions and adapt to the physical, environmental, and social impacts of **CLIMATE CHANGE** and **NATURAL HAZARDS**.

#	Strategic Priorities	Broad Objectives	Objectives (next five years)	Measures	Process Measures	To Date	Annual Goal	Total goal	To go	Projects/Notes
CLIMATE CHANGE										
D.1.1 MAPC will work with municipalities to help them become more resilient in the face of climate change										
			a. MAPC will develop a template for the development of climate change adaptation plans for municipalities and subregional efforts. The template will include a method for assessing climate change vulnerabilities.	<ul style="list-style-type: none"> The methodology and template will be created. MAPC will work with 5 municipalities and an additional 5 multi-municipal clusters to develop climate change adaptation plans. 	methodology & template created	1	1	1	0	initial draft developed, undergoing revision; ED funds and Barr funds
			b. MAPC will develop a climate resiliency toolkit, based on measures including MAPC's Regional Climate Change Adaptation Strategy (RCCAS) and clean energy resiliency initiatives. The toolkit will include strategies and actions municipalities can take to prepare for the effects of climate change.	<ul style="list-style-type: none"> The toolkit will be created 40 communities will implement action items. 	toolkit	0	1	1	1	longer term goal (FY2018)
					local actions	1	8	40	39	Milton stormwater utility adopted



Metro Boston Regional Adaptation Climate Change Strategy

- *WORKING DRAFT* -

Funding provided by the Federal Sustainable Communities Program and the Barr Foundation

Revised June 2015

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Includes:

- ✓ **Regional / Subregional Vulnerability Assessment**
- ✓ **Adaptation/Mitigation Goals and Objectives**
- ✓ **Implementation Strategies**
- ✓ **Resources/References**

Regional Vulnerability Assessment Summary

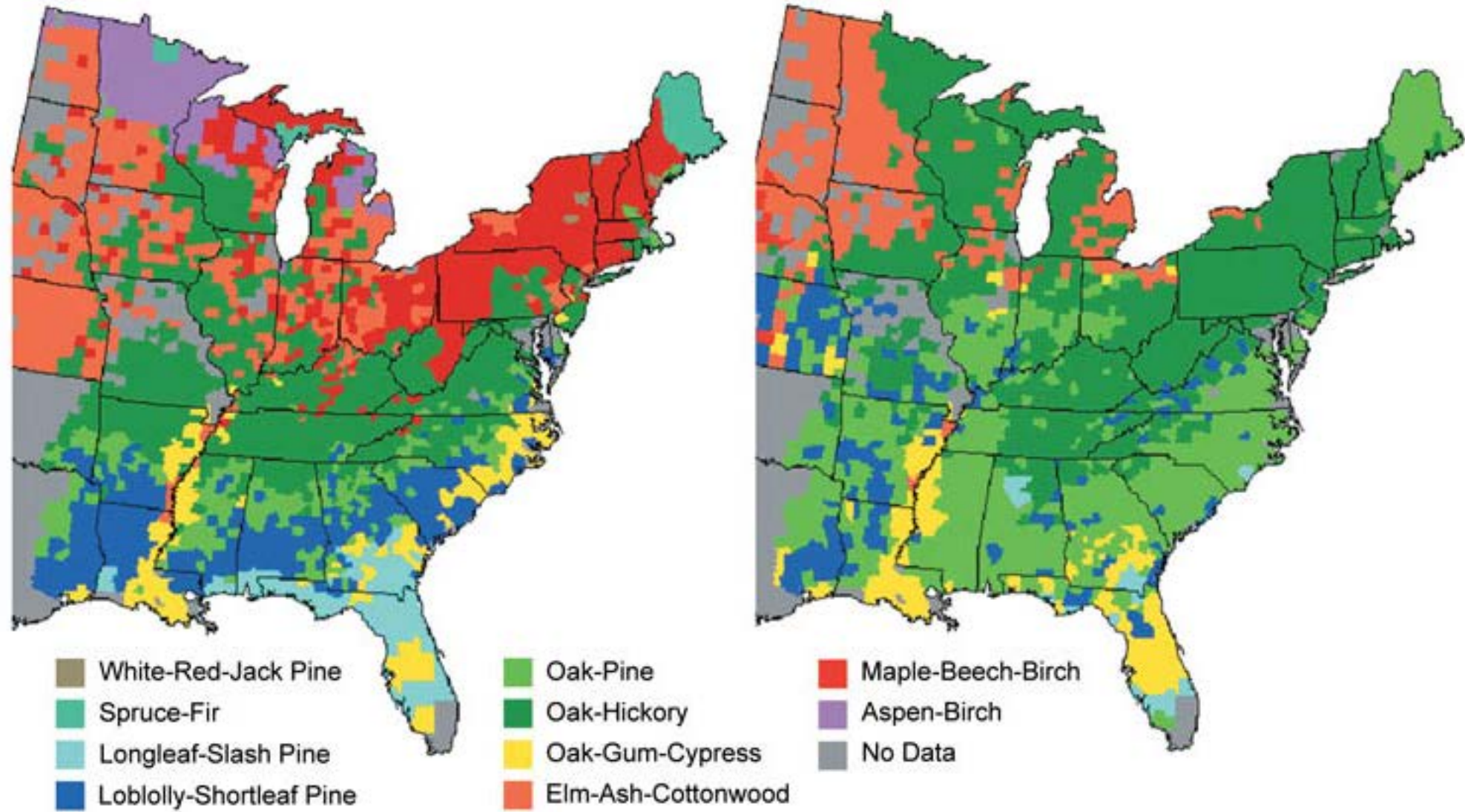
Parameter	Current Conditions (1960 - 2000)	Predicted Range by 2050	Predicted Range by 2100
Average Annual Temperature	47 °F	47 – 56 °F	56 – 60 °F
Average Summer Temperature	69 °F	69 - 76 °F	76 - 84 °F
Average Annual Winter Temperature	24 °F	24 – 32 °F	32 – 37 °F
Average Annual Precipitation	41 in.	+ 5% - 8%	+ 7% - 14%
Average Summer Precipitation	11 in.	- 1% - 3%	- 1%
Average Winter Precipitation	8 in.	+ 6% - 16%	+ 12% - 30%
Streamflow (# Days of Flow from Jan. 1 Peak)	85 days	77 - 80 days	72 – 74 days
Droughts (# Days per 30 yrs)	13 days	18 - 20 days	16 - 23 days
Sea Level Rise	0.8 - 1 foot	1 - 4 feet	2 – 7 feet*

* Uncertainty surrounding ice sheet melt rate. New information factoring in higher rates suggests up to 10 feet.

Forest Impacts

Recent Past
1960-1990

Projected
2070-2100

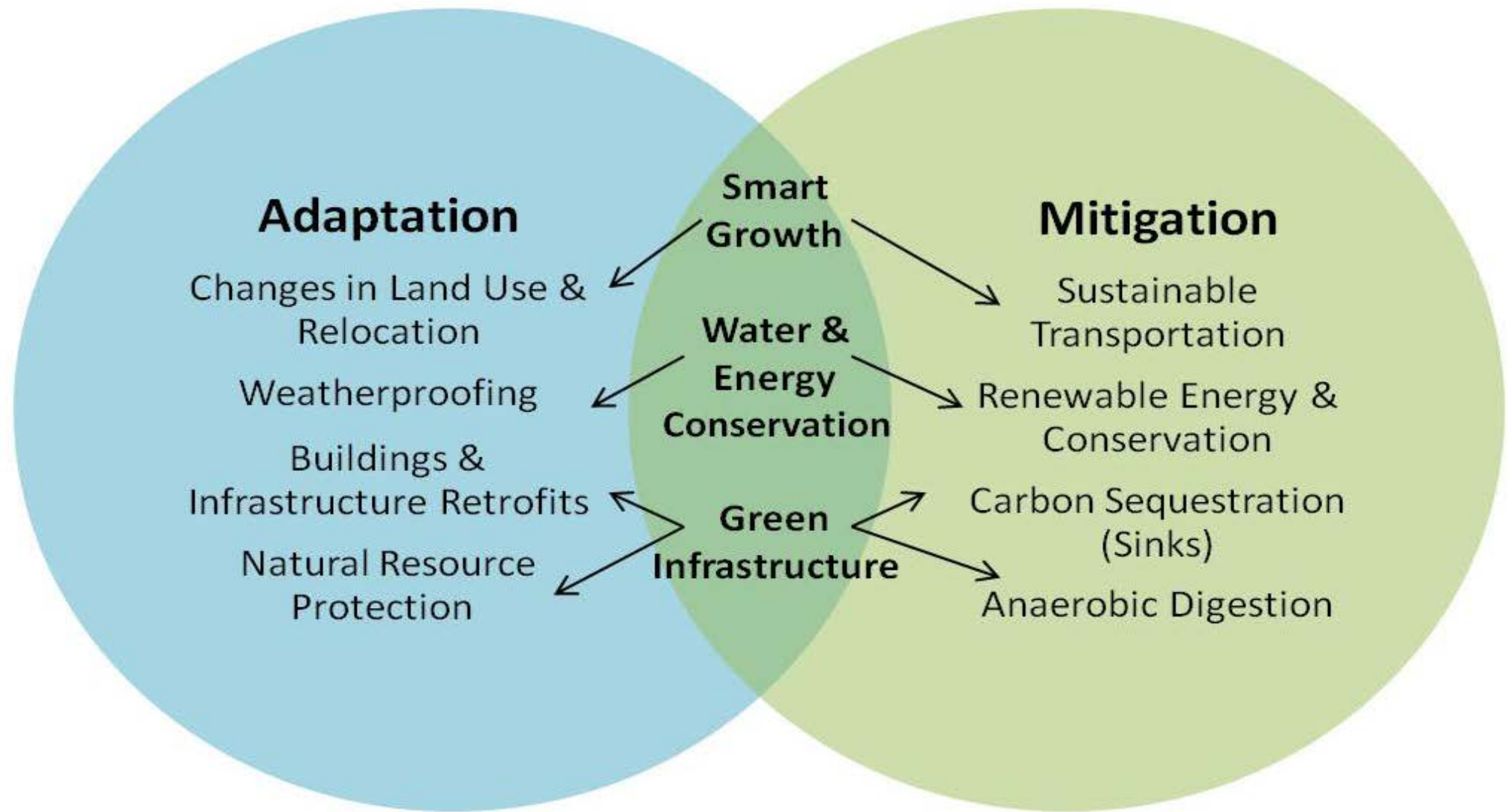


Source: US EPA Region 1

Strategy Goals & Objectives

Sector	Subtopic	Objectives
Built Environment	Development, Green Infrastr., Tree Canopy	1) New development/redevelopment designed to adapt to climate impacts (heat, precipitation, etc.)
	Development	2) Redevelopment located outside of the highest hazard areas
Natural Resources	Protection	3) Natural functions of ecosystems, shorelines and critical habitat areas will be restored
	Management	4) Conserve and manage habitats to support healthy fish, wildlife and plant populations and ecosystem functions
	Restoration	5) Restore ecosystem processes to increase capacity to adapt
Coastal Zone	Protection, Storm Assess.	6) Coastal areas resilient to climate change impacts
Key Infrastructure	Energy, Water/WW/SW, Transportation, Green Infrastructure	7) Resilient transportation, water/wastewater, and energy infrastructure
	Roads & Crossings	8) All existing tide and flood control structures assessed for flood control
Local Govt./ Econ.	Asset Mgmt & Capacity	9) Local and regional asset management preparation and monitoring
Human Health & Welfare	Vector Diseases, Vulnerable Populations	10) A public protected from extreme climate change health impacts, with particular focus on vulnerable populations


RESILIENCY =



How?

A. Vulnerability Assessment w/ A Conservation Lens

1. Assess urban forestry conditions:
 - a. Spatial Analysis
 - b. Urban Forest Resource Inventory
 - c. Open Space Plan
2. Determine impacts to forest resources based on Future Conditions:
 - a. Additional Spatial Analysis
 - b. Quantitative Analysis
 - c. Qualitative Analysis – Information from Muni Officials, Conservation Orgs, Residents, etc.
3. Think about Linkages:
 - a. Stormwater Management
 - b. Public Health
 - c. Built Environment



Resilient: (*adjective*) able to withstand or recover quickly from difficult conditions

MAPC Climate Planning Projects



South Shore Climate Assessment – pilot (2011)



Scituate & Duxbury Coastal Resiliency Plan (2015)



Massachusetts Office of Coastal Zone Management

Minuteman Subregional Climate Assessment (2016)



Resilient Quincy Plan – pilot (2016)



Climate Smart Region Program – pilot (2016)



Braintree Vulnerability Assessment (2017)



Northeastern

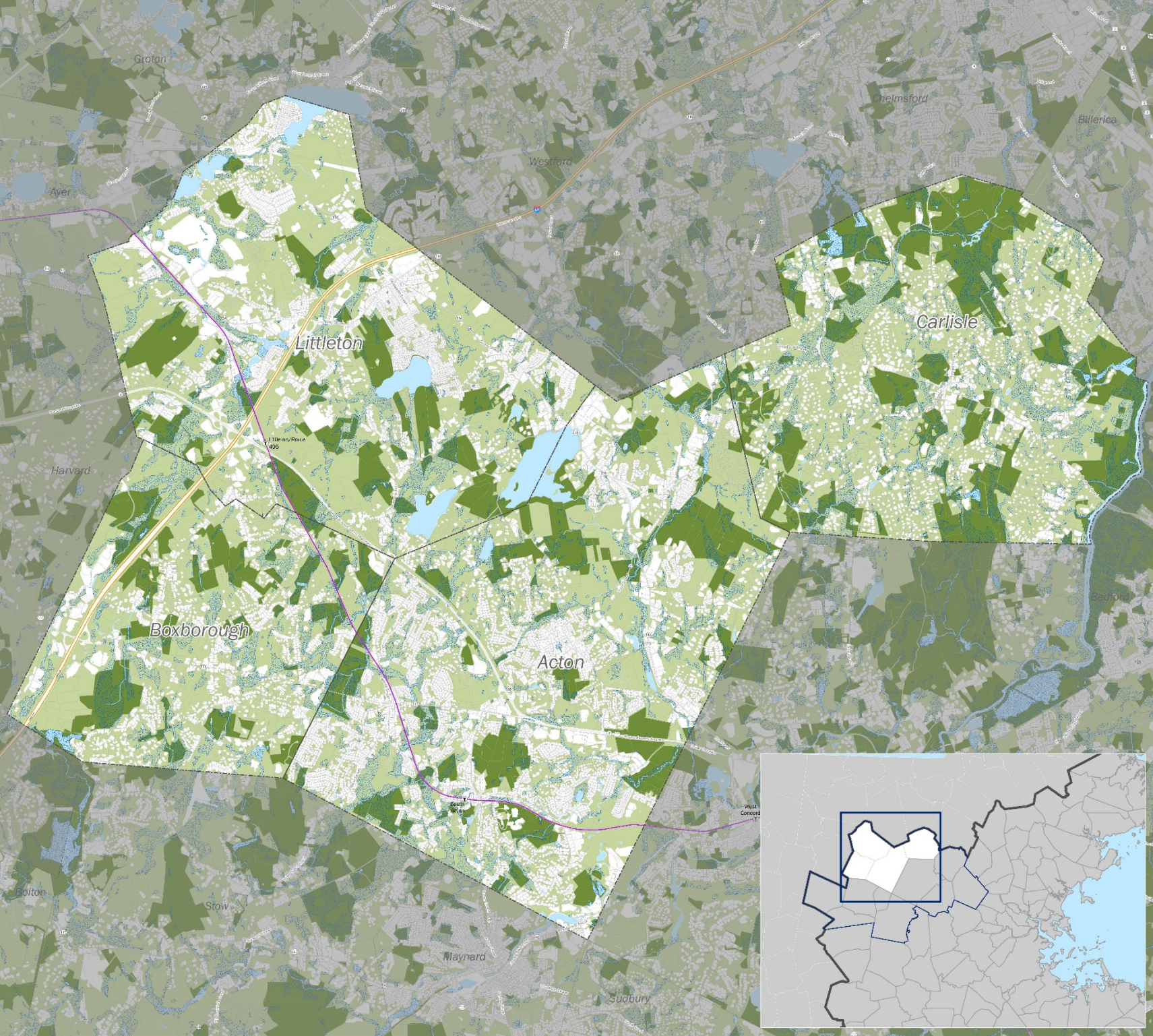
Newton Climate Assessment & Action Plan (2017)



Brookline Vulnerability Assessment (2017)



Vulnerability Assessments: Mitigating Factors - Forests, Green Spaces



MAGIC Subregion (Acton, Carlisle, Boxborough, and Littleton) Climate Adaptation Plan

Mitigating Factors

- Municipal Boundaries
 - Commuter Rail Stations
 - Commuter Rail Lines
 - Parcels
 - Wetlands
 - Rivers and Streams
 - Water Bodies
 - Protected Open Space
 - Open Space and Vegetation
- Roads**
- Interstate
 - U.S. Highway
 - State Route
 - Non-numbered route



The information depicted on this map is for planning purposes only. It is not adequate for legal, regulatory, or general level use.

Produced by:
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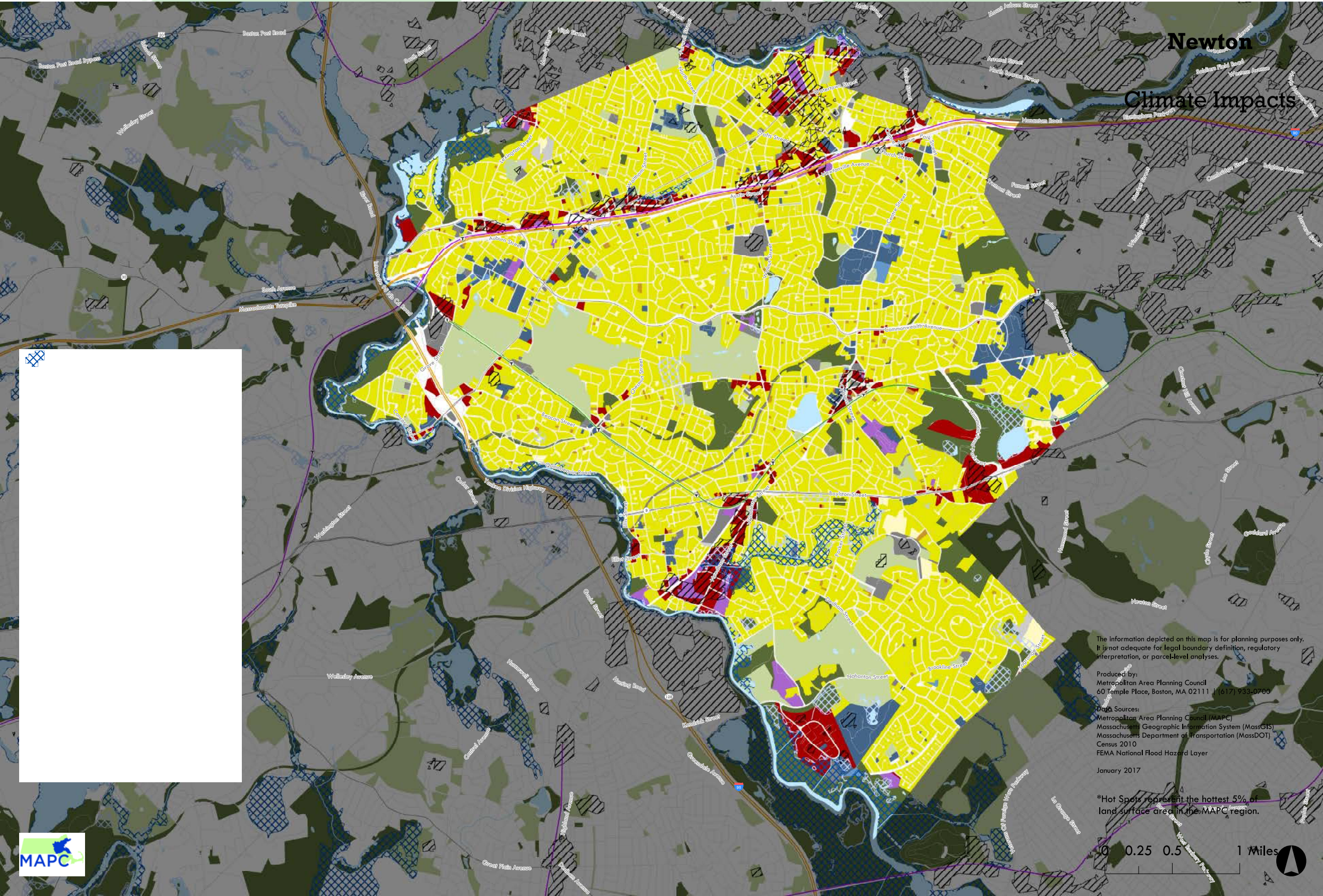
Data Sources:
Aerial Imagery/Mapbox
Metropolitan Area Planning Council (MAPC)
Massachusetts Geographic Information System (MassGIS)
Massachusetts Department of Transportation (MassDOT)



September, 2019



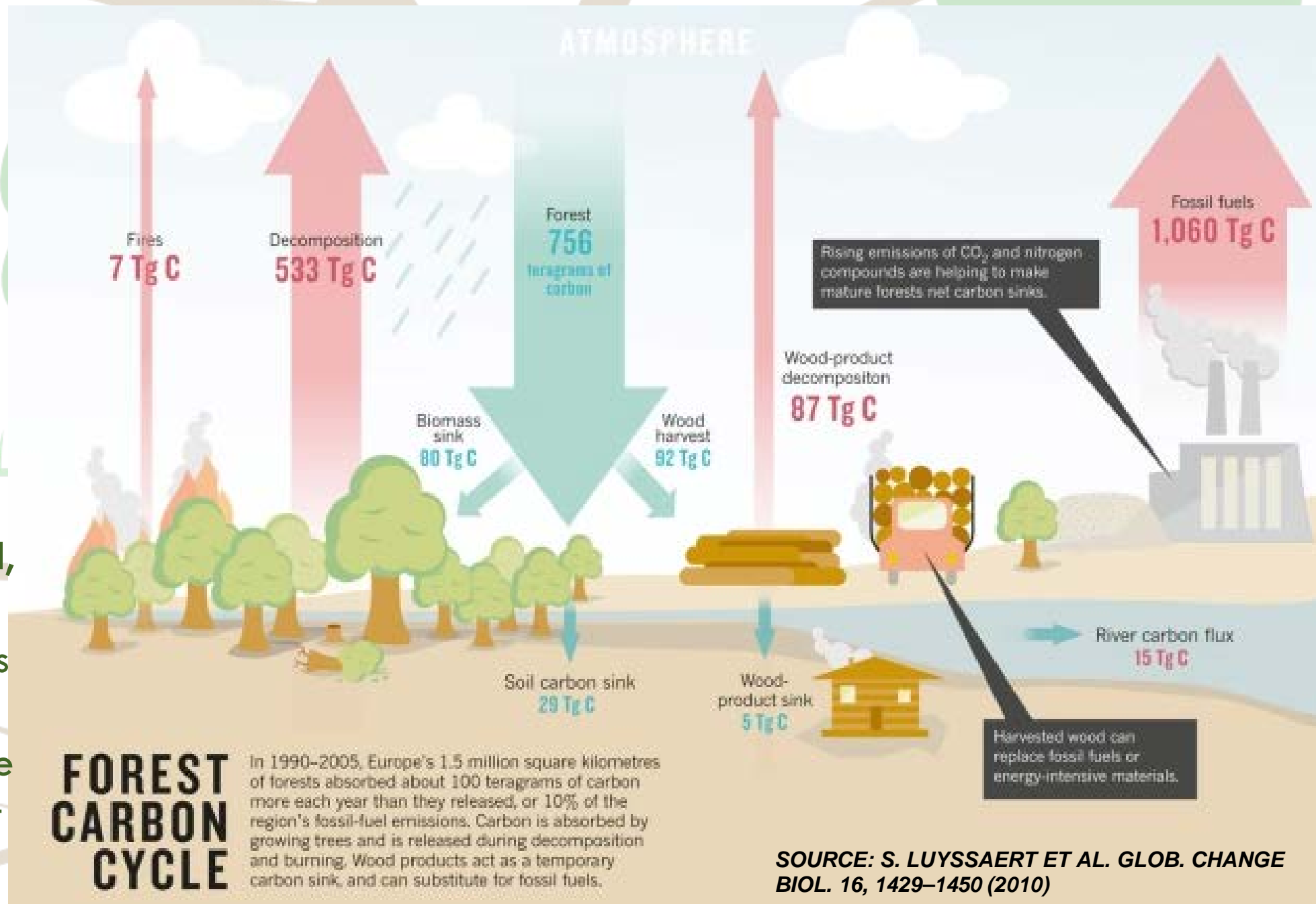
Vulnerability Assessments:



Highlight Resiliency Linkages:

carbon sequestration

Forests are important for removing carbon dioxide from the atmosphere and for serving as carbon sinks—places where carbon can be stored. In the eastern United States, it is estimated that 50% of carbon is stored in the forest soil, 36% is stored in living plants and trees, 8% is stored in deadwood, and 6% is stored in the leaf litter on the forest floor.



Action Plan Elements:



1. Prioritization:

- a. Select/prioritize natural areas for preservation – those known to be resistant to climate changes
- b. Planning goals/objectives to improve landscape connectivity:
 - Create and maintain linkages between natural areas
 - Striking a Balanced Approach: Planning for both “wild” forested areas and more intensively managed forest areas (i.e. street trees) in urban setting
 - Evaluate opportunities for retrofitting using Green Infrastructure

2. Policy / Regulatory Changes:

- a. Minimum tree canopy standards,
- b. Protection of natural areas (set-backs, land use standards),
- c. Land clearing standards and prohibitions,
- d. Resilient tree species list for new plantings, etc...

Implementing an Action Plan:



1. Anticipate constraints of policy change (e.g. government, development community opposition)
2. Execute education and outreach programming
3. Organization / Work Planning:
 - Departmental Work Plans
 - Interdepartmental Coordination (Climate Committee)
 - Conservation Programming (e.g. Urban Forestry, CPA, Conservation Easements)
 - Innovative Land Protection Measures (e.g. Transfer of Development Rights, Development Impact Fees, Green Infrastructure Incentives/ Credits (note: MS4))

Include Urban Forestry in Action Plan:

E.g. City of Kirkland, WA Urban Forestry Strategic Plan

- Includes 2014 to 2019 Work Plan for City Departments to Implement
- Strategies Include:
 - ✓ Tree Inventory Standards
 - ✓ Planting Guidelines
 - ✓ Urban Forestry Management Measures
 - ✓ Street Tree Code
 - ✓ Community Engagement Program

OBJECTIVE/TARGET DATE	2014				2015				2016	
	Jan-Mar	Apr-June	July-Sept	Oct-Dec	Jan-Mar	Apr-June	July-Sept	Oct-Dec	Jan-Mar	Apr-June
1.0 URBAN FOREST ASSET										
1.1 Public Tree Inventories										
1. Right-of-way										
2. Active parks										
3. Open space										
4. "Other" – CKC, etc.										
1.2 Tree Planting Guidelines & Incentives										
1. Minor Efforts										
2. Major Efforts										
1.3 Environmental Benefits Analysis										
1.4 Re-assess Canopy Cover										
2.0 URBAN FOREST PROGRAM										
2.1 Develop UF Program/Funding										
2.2 Proactively Manage Public Trees										
2.3 Annual Work Plans				ALL			ALL			
2.4 Report to City Council										
2.5 Revise UF Management Plan										
3.0 MUNICIPAL-COMMUNITY INTERACTION										
3.1 Involve Community in UF Decisions										
3.2 Grow GKP Program										
3.3 Meet TCUSA & Growth Award Criteria										
3.4 Kirkland Arbor Day										
3.5 Heritage Tree Program										
3.6 Promote Tree-related Awards & Accreditation										
3.7 Kids' Outreach										
4.0 POLICIES & CODES										
4.1 Tree Code Outreach										
4.2 Public Tree Maintenance Standards										
1. Storm Response										
2. Vegetation Management Plans										
3. Safety Protocols/Policy										
4. TCIA Accreditation										
4.3 Update Tree Codes										

PCD/UF (Note: Urban Forester position = .5 FTE)
 Public Works
 Parks

CITY OF KIRKLAND

**Citywide Urban Forestry Strategic Management Plan
Urban Forest Work Plan 2014 – 2019**

Planning & Community Development
Parks & Community Services
Public Works



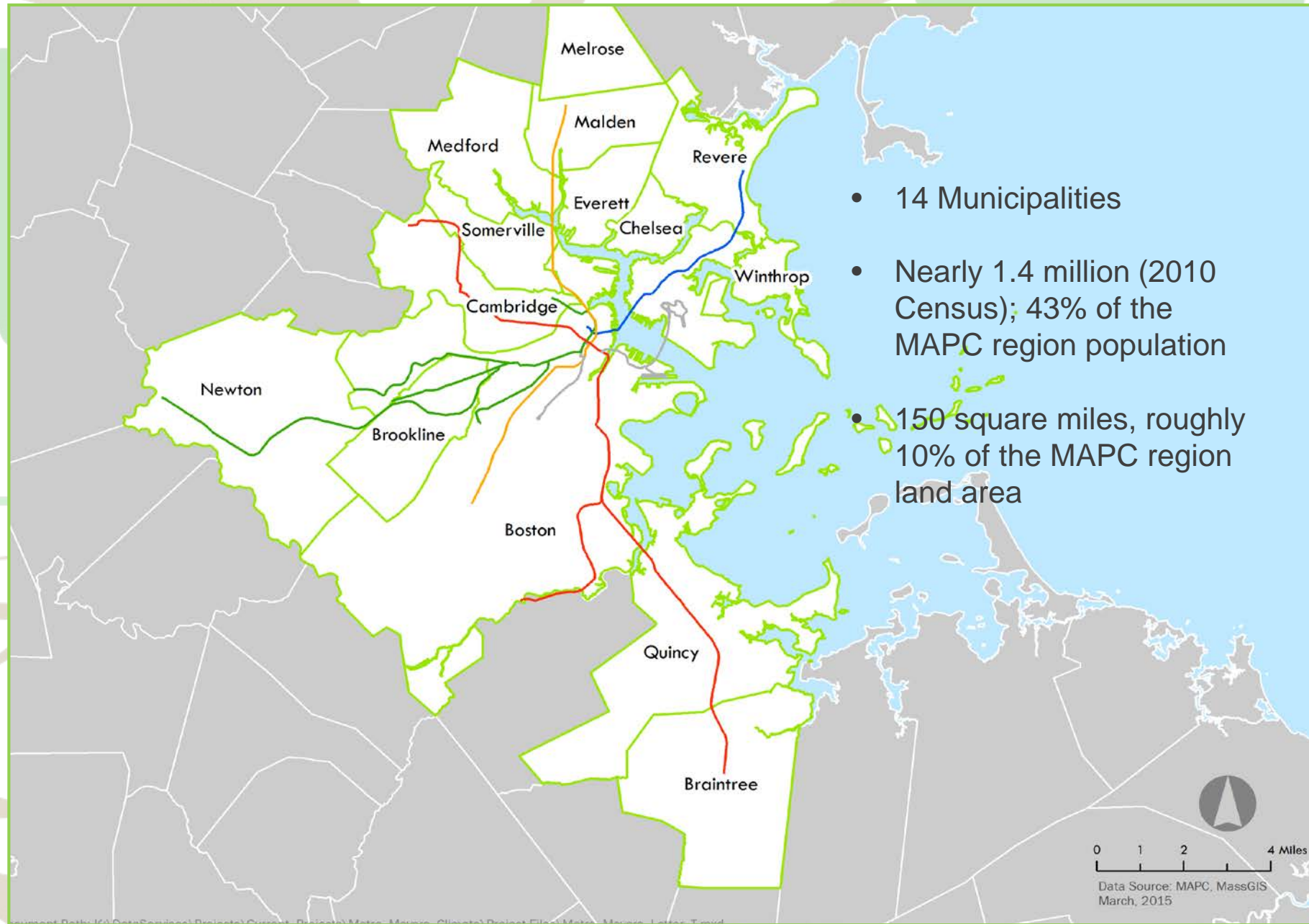
Implementation - Partnerships:

Metro Mayors Coalition

Safety in Numbers!

May 2015:
Metro Mayors Coalition convened to sign a Climate Preparedness Commitment.

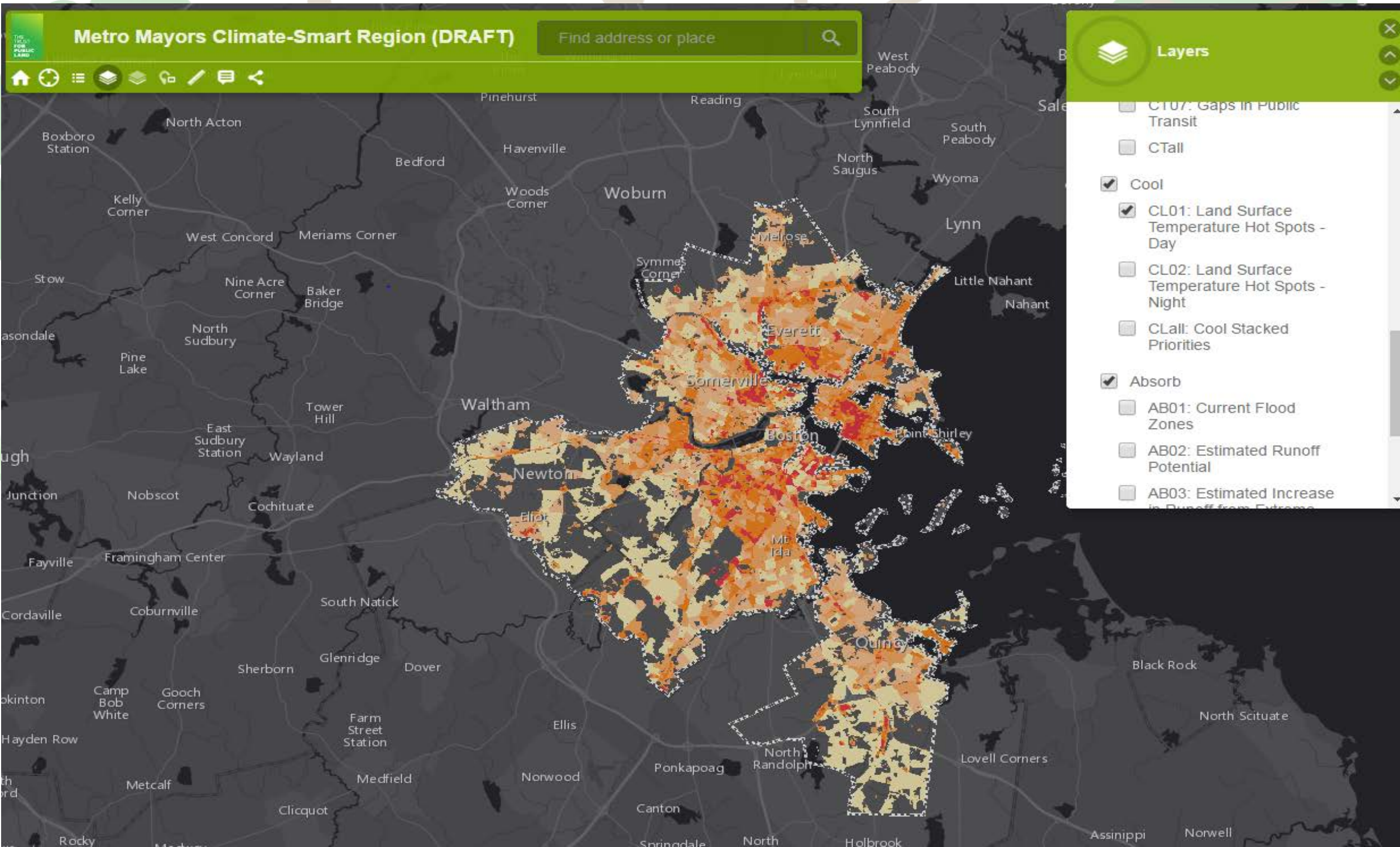
November 2016:
The Coalition convened to reflect on preparedness activities of the past year, announce their strategic priorities for 2017, and sign a regional mitigation commitment.



THE TRUST FOR PUBLIC LAND



Implementation - Tools: Climate Smart Region Decision Support Tool

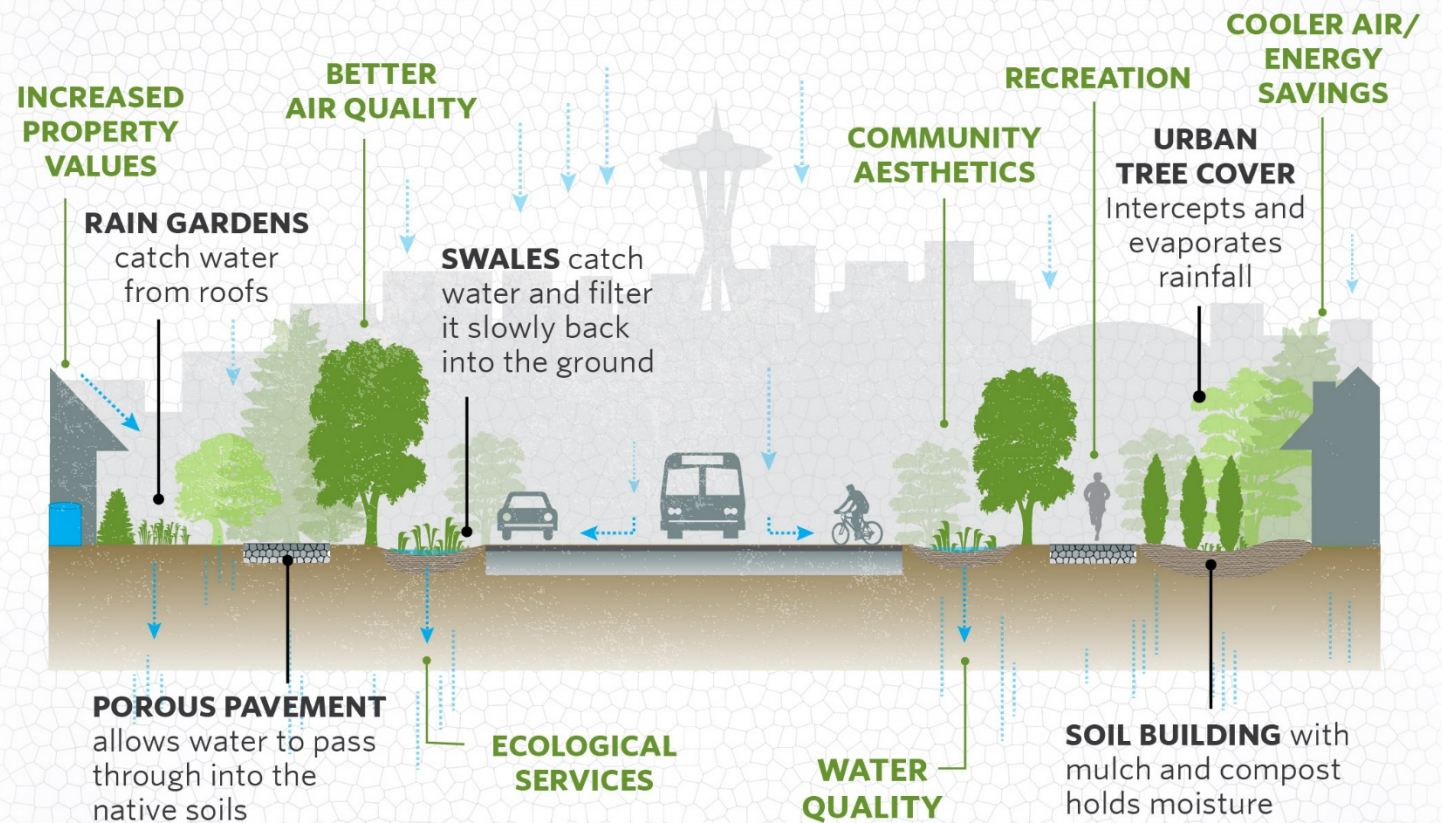


Implementation – Re-Imagine: Green Infrastructure



HOW ARE WE RETHINKING THE PROBLEM?

Re-envisioning and re-designing cities to function more like forests so water is absorbed back into the ground, in addition to treating stormwater through traditional means, will solve our region-wide stormwater problem.



GREEN & GRAY STORMWATER INFRASTRUCTURE

A study by the city of Philadelphia has shown a hybrid approach of green and gray infrastructure can get the same freshwater solutions as gray infrastructure, plus additional benefits to the community.

Questions? / Discussion



Photo: “Before it’s too Late” by World Wildlife Fund, Paris Branch