

NCS in action: Greening the Gateway Cities and the importance of trees from rural forests to city streets

Laura Marx, *The Nature Conservancy*

Mat Cahill, *Dept. of Conservation and Recreation*

Greening the Gateway Cities community partners

November 13, 2019

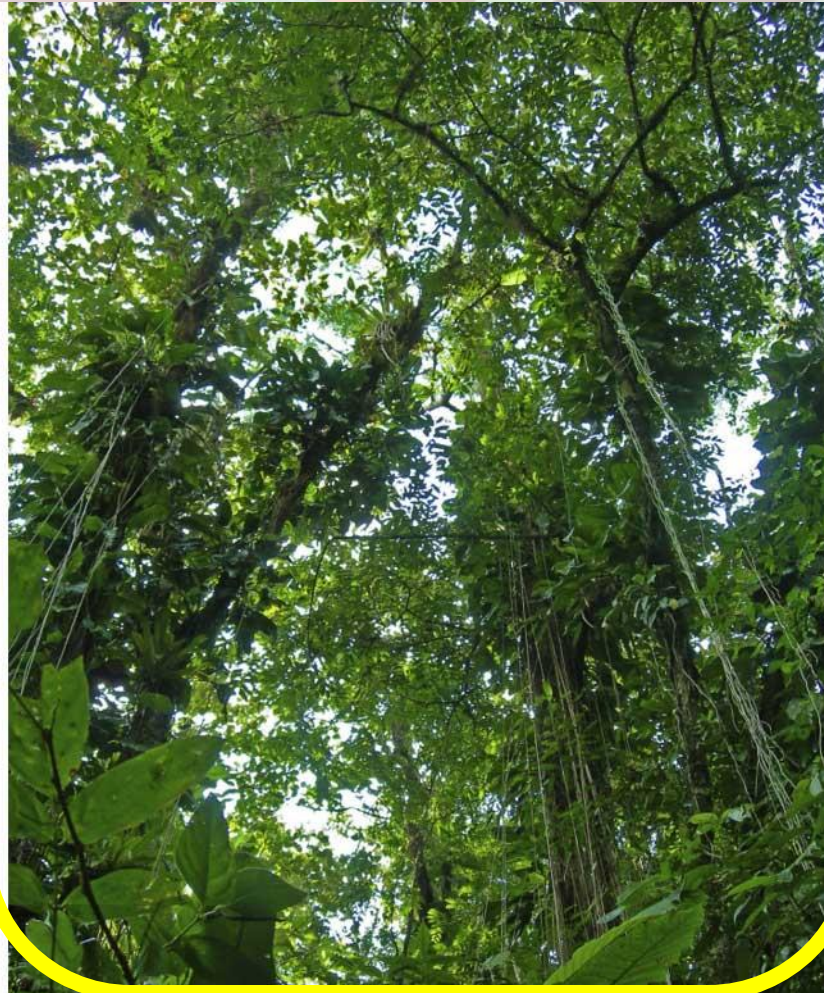


Tackling climate change:

**REDUCE
EMISSIONS**



**REMOVE
EMISSIONS**



**ADAPT TO
EMISSIONS**



What are **Natural Climate Solutions**?

protect, restore & better
manage

forests, farms & wetlands

to **reduce** and **remove**
carbon emissions

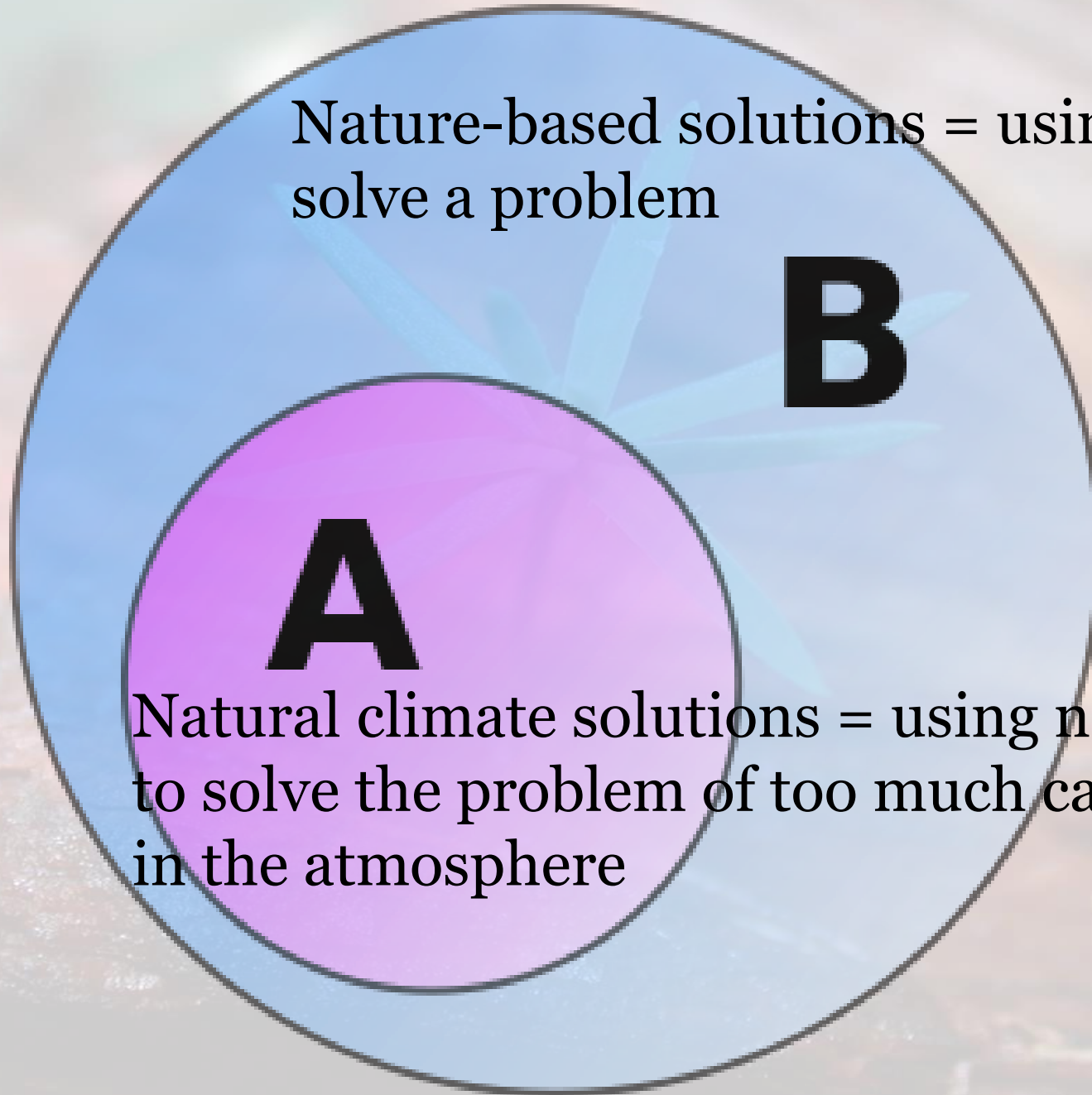



Nature-based solutions = using nature to solve a problem

B

A

Natural climate solutions = using nature to solve the problem of too much carbon in the atmosphere





Natural climate solutions can provide ~ 21% of the emissions reductions needed each year to meet the Paris Climate Agreement goals in the US, almost all at a price point of under \$100 per ton of carbon.

Fargione et al. 2018

Natural Climate Solution:

AVOIDED FOREST CONVERSION



©Lauren Owens Lambert

Natural Climate Solution:

IMPROVED FOREST MANAGEMENT

2012



Natural Climate Solution:

HEALTHY SOILS



Natural Climate Solution:

BLUE CARBON



US Climate Alliance: “We are still in”



Natural & Working Lands Challenge

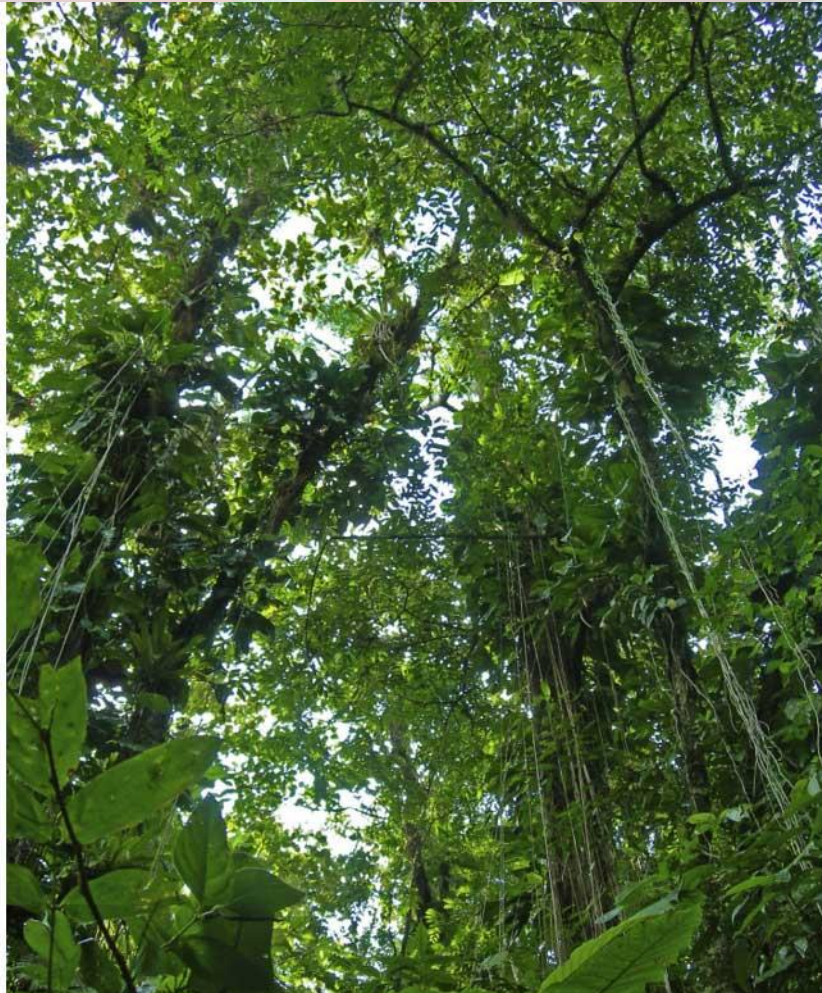
The natural systems upon which we depend are essential to life and critical for reducing the impacts of climate

Tackling climate change:

**REDUCE
EMISSIONS**



**REMOVE
EMISSIONS**

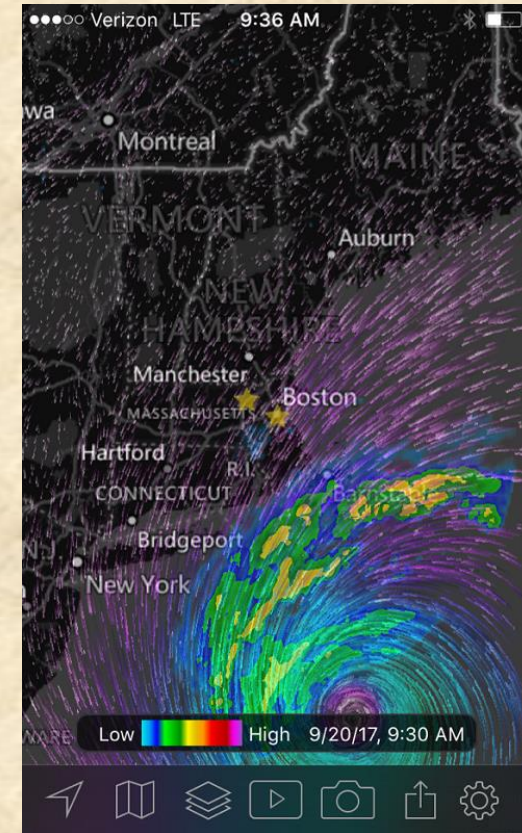


**ADAPT TO
EMISSIONS**





Community Trees As Natural Climate Solutions



MA Department of Conservation and Recreation



- **Mission:** *"To protect, promote and enhance our common wealth of natural, cultural and recreational resources for the well being of all"*
- In meeting today's responsibilities and planning for tomorrow, DCR's focus is on:
 - Improving outdoor recreational opportunities and natural resource conservation
 - Restoring and improving our facilities
 - Expanding public involvement in carrying out DCR's mission, and
 - Establishing first-rate management systems and practices



Bureau of Forest Fire Control and Forestry



- Urban and Community Forestry Program
 - Assists communities and nonprofit groups in protecting, growing, and managing community trees and forests with grant programs, technical assistance and training



U&CF Continued



- DCR U&CF supports Massachusetts communities through numerous programs including:
 - Competitive Grant opportunities
 - Citizen Forester Newsletter
 - Tree City USA
 - Greening the Gateway Cities
 - Annual Arbor Day poster contest



What are Urban and Community Forests?

- The trees, plants and associated ecosystems where people live!
 - country roads in rural towns
 - new developments in the suburbs
 - concrete neighborhoods in cities and old mill towns

Our landscape is a continuum from rural forest to city center



Urban and Community Forestry is Not Just about Trees

- The greater ecological system of plants, soils, wildlife, and water are all important in supporting clean and healthy communities for humans.



The Health of the Urban Forest Affects the Quality of Our Lives

- Our ecosystem directly affects the quality of the water we drink, the air we breathe, the stability of our neighborhoods, and our sense of community and individual pride.



Community Forestry Builds Stronger Communities!

- Planting, gardening, teaching, planning, celebrating—these activities bring diverse members of our communities together.
- This strengthens our bonds to our landscapes, and improve the entire community's quality of life.



U&CF Resources

50/50 Matching Grants

www.mass.gov/guides/urban-and-community-forestry-challenge-grants



Citizen Forester Newsletter

www.mass.gov/lists/the-citizen-forester-newsletter



Greening the Gateway Cities

www.MAUrbanCanopy.org



Tree City USA (Arbor Day Foundation) Annual Arbor Day poster contest



More U&CF Resources

Urban and Community Forestry Fact Sheets

www.mass.gov/lists/urban-and-community-forestry-fact-sheets

UMass Extension & Urban Forestry Today

www.urbanforestrytoday.org

<https://ag.umass.edu/landscape>

UMass
Extension

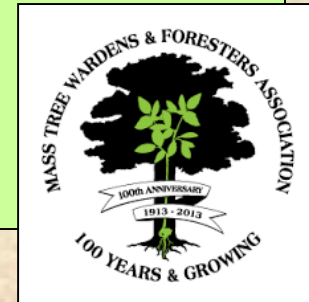
Landscape,
Nursery &
Urban Forestry
Program



Massachusetts Tree Wardens

– MA Qualified Tree Warden training course

<https://masstreewardens.org/>



www.mass.gov/lists/picks-and-shovels-urban-and-community-forestry-resources

- ✓ State Laws that Govern Public Trees
- ✓ Funding and Sustaining an Urban Forestry Program
- ✓ Community Tree Boards and Committees
- ✓ Tree Survey / Inventory Resources
- ✓ Example Urban Forest Management Plans
- ✓ Community Tree Ordinances and Bylaws for Massachusetts
- ✓ Additions to Zoning and Sub-Division Regulations
- ✓ Draft or Sample Tree Ordinances
- ✓ *And Much, Much MORE!*

stand Extreme



DEPARTMENT OF CONSERVATION AND RECREATION IMPLEMENTING THE GATEWAY CITIES PROGRAM **TREE BOOK** TABLE OF CONTENTS

Trees

Alvatica
x acerifolia
acutissima
alba
bicolor
imbricaria
macrocarpa
palustris
populus x bicolor
astigiata
rubra
trifolia
pinum japonicum
distichum
canadense
rostrata
americana cultivars
folia
trata
trata 'Mushashino'

Secondary Considerations

- *Acer miyabei*
- *Carpinus caroliniana*
- *Cercidiphyllum japonicum*
- 'Hanna's Heart'
- *Halesia carolina*
- *Koelreuteria paniculata*
- *Maackia amurensis*
- *Ostrya virginiana*
- *Oxydendrum arboreum*
- *Parrotia persica*
- *Stewartia pseudocamellia*
- *Styrax japonicus*

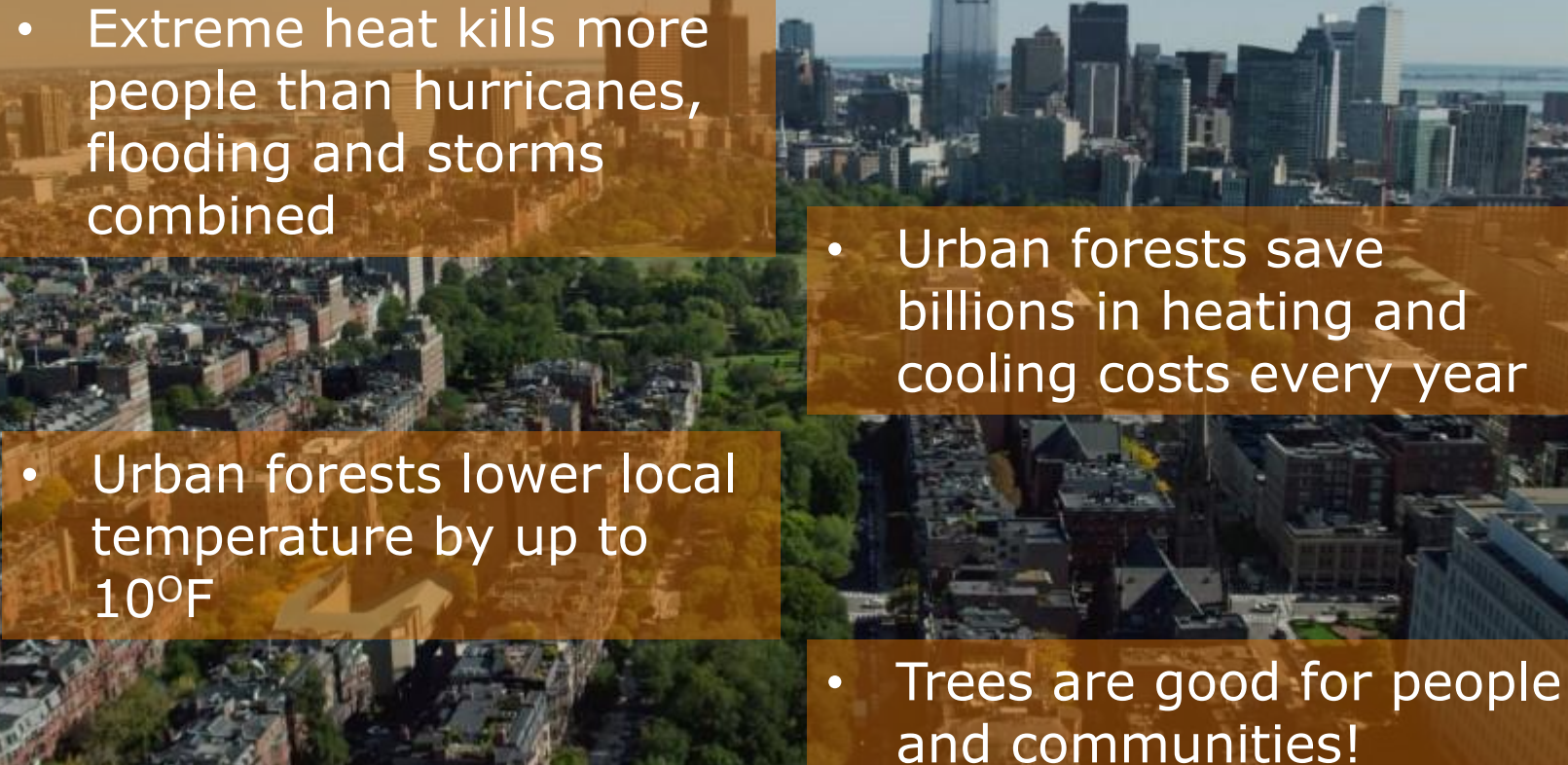
Evergreens

- *Abies balsamea*
- *Abies concolor*
- *Abies fraseri*
- *Ilex opaca*
- *Juniperus virginiana*
- *Picea abies*
- *Picea glauca*
- *Picea omorika*
- *Picea orientalis*
- *Picea pungens*
- *Pinus nigra*
- *Pinus strobus*
- *Pseudotsuga menziesii*



- *Magnolia acuminata*
- *Metasequoia glyptostroboides*

Importance of Community Forests in Addressing Climate Change

- 
- Extreme heat kills more people than hurricanes, flooding and storms combined
 - Urban forests lower local temperature by up to 10°F
 - Urban forests save billions in heating and cooling costs every year
 - Trees are good for people and communities!







Tree Retention Summary

- Let the Forest do the Work!

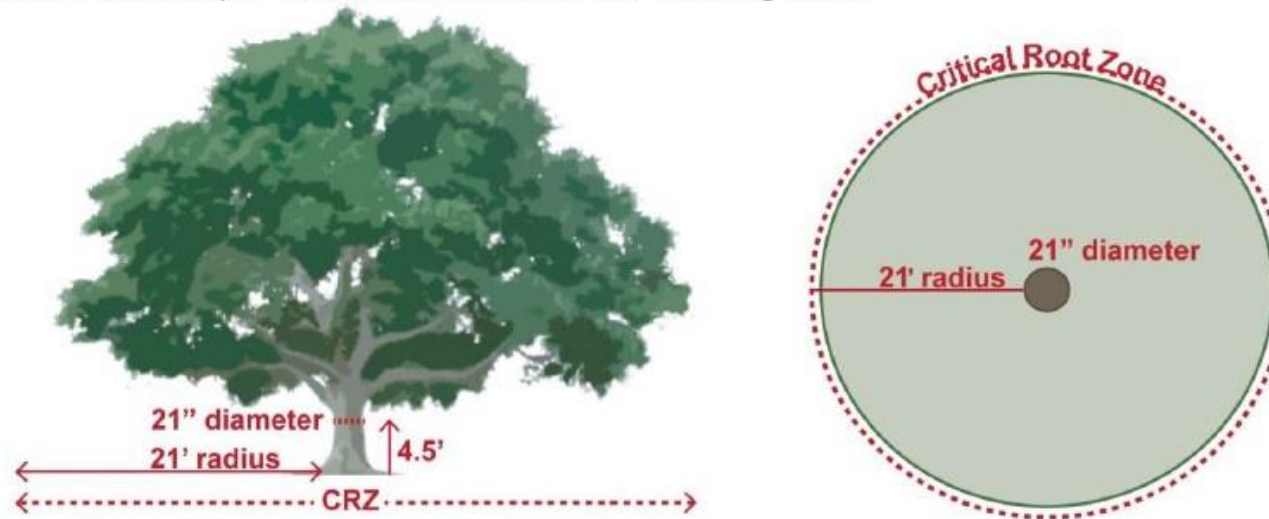


Protect what you have!

Definitions

Best Management Practices (BMPs) are general guidelines used in many different disciplines to help define the best currently known or accepted practice for an optimal outcome.

Critical Root Zone (CRZ) is the area of soil extending from the tree trunk where roots required for future tree health and survival are located. This area can also be defined as a circle with a *minimum* radius of 1' for every 1" in trunk diameter at 4.5" above ground.



Tree P

LEARN ABOUT I-TREE

More than beauty and shade, trees work hard for us all. Explore how trees improve the environment in communities big and small, urban and rural...even in your own backyard!

What benefits do trees provide? ➞



i-Tree is a combination

i-Tree Tools



i-Tree Landscape

Rapidly assess human and forest population information; threats to help prioritize areas for tree planting; protection.



i-Tree Canopy

Easily estimate tree canopy and benefits using aerial photographs.



Climate Change at the Local Level

Trees in the Urban Landscape



Greening the Gateway Cities Program

- Part of the effort to implement the Commonwealth's Global Warming Solutions Act of 2008.
- Requires greenhouse gas (GHG) emissions to be reduced to 25% below 1990 levels by 2020 and 80% below 1990 levels by 2050.

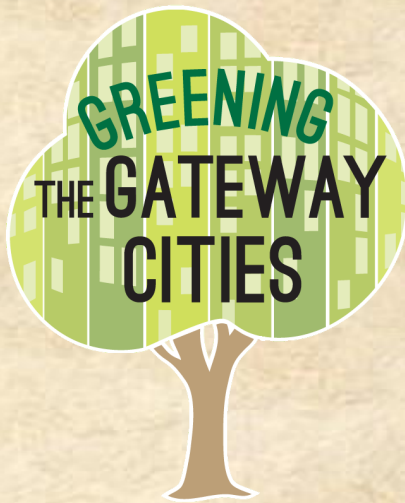
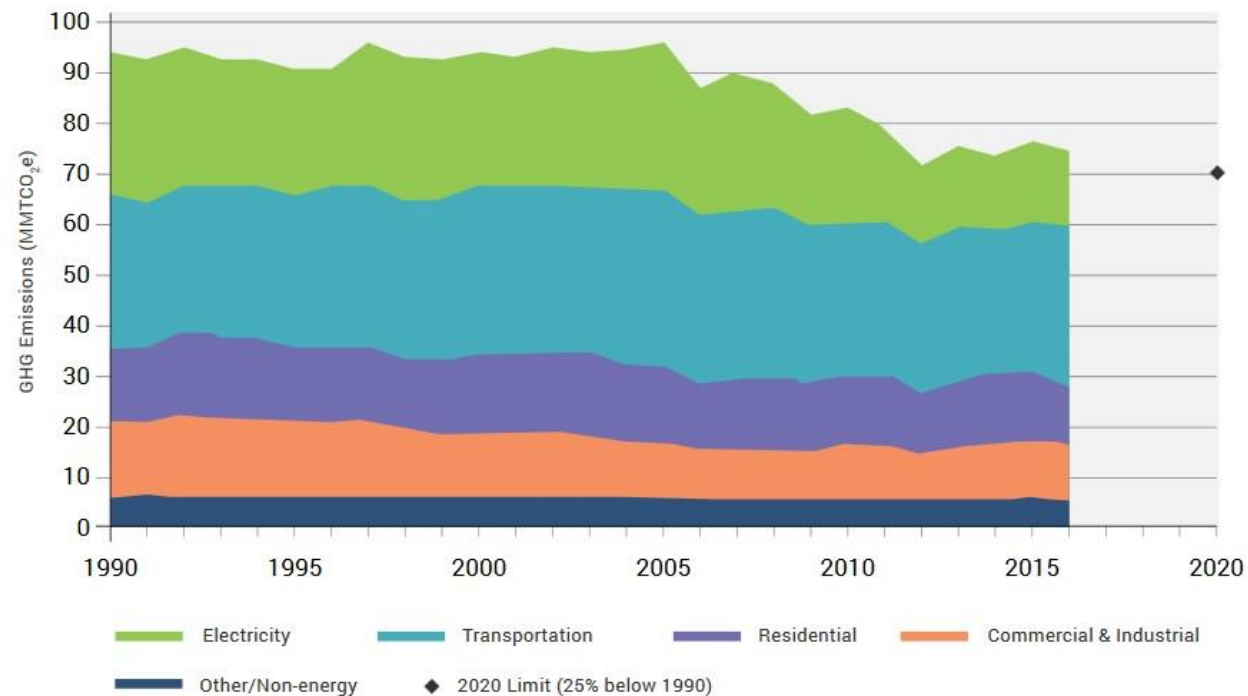


FIGURE 2 | MASSACHUSETTS GHG EMISSIONS, 1990 – 2016



Greening the Gateway Cities Program

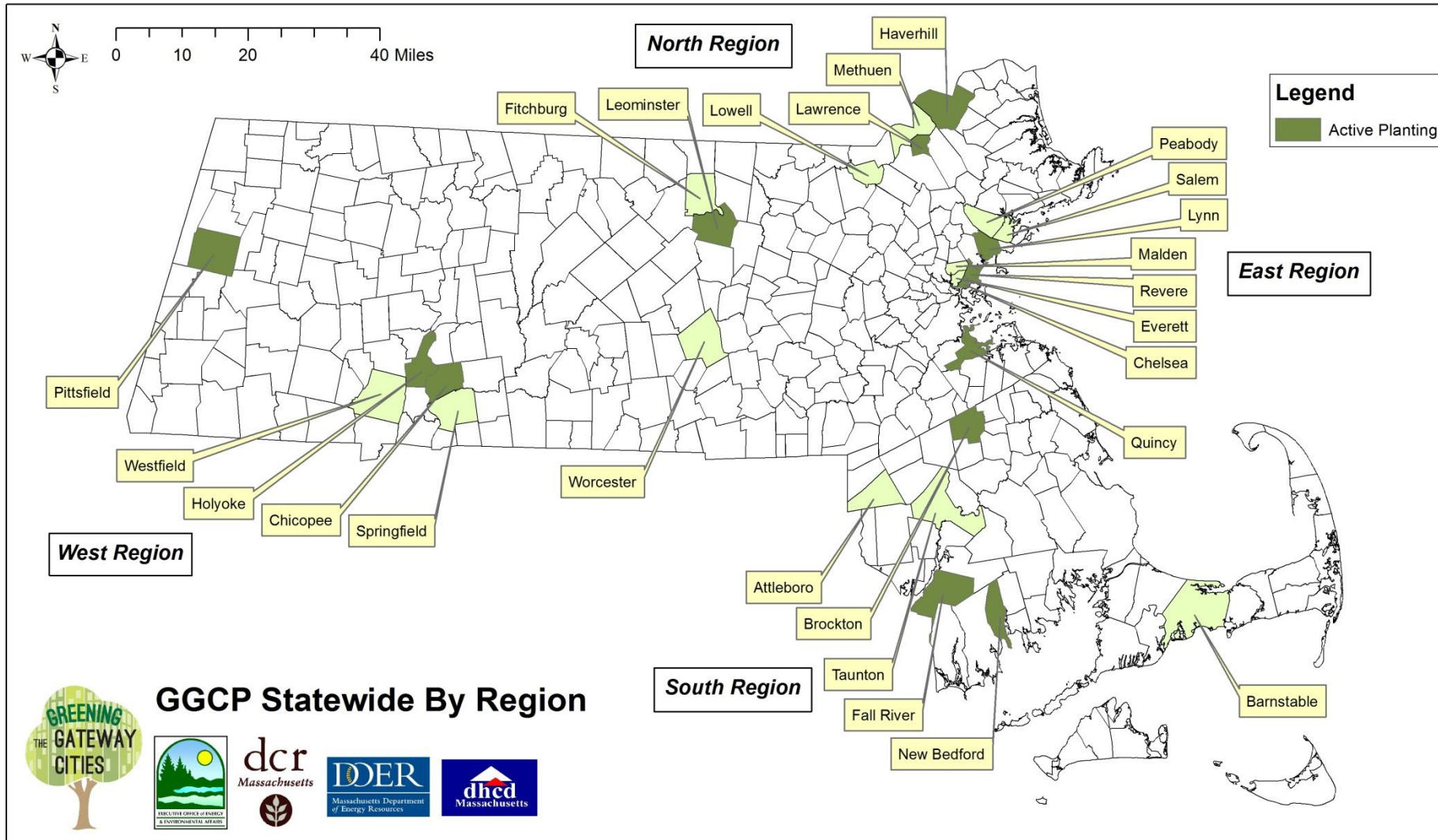
- At its core, the GGCP is an environmental and energy efficiency program designed to:
 - Reduce household heating and cooling energy use by increasing tree canopy cover in Environmental Justice neighborhoods
 - Sequester carbon currently in the atmosphere
 - Avoid future carbon emissions



What is a Gateway City??

- The General Laws of Massachusetts, Chapter 23A, Section 3A defines **Gateway Cities** as:
 - a municipality with a population between 35,000 and 250,000
 - a median household income below the commonwealth's average
 - a rate of educational attainment of a bachelor's degree or above that is below the commonwealth's average
- There are currently 26 Gateway Cities in Massachusetts.





Why Gateway Cities?

Big opportunity for savings

- Old, tall, poorly insulated houses (81% built before 1980)
- Dense residential areas
- Low existing canopy cover

Big need for savings

- High poverty rates (many 2X average)
- Large minority & immigrant population
- Large renter population (60%)
- Limited municipal resources

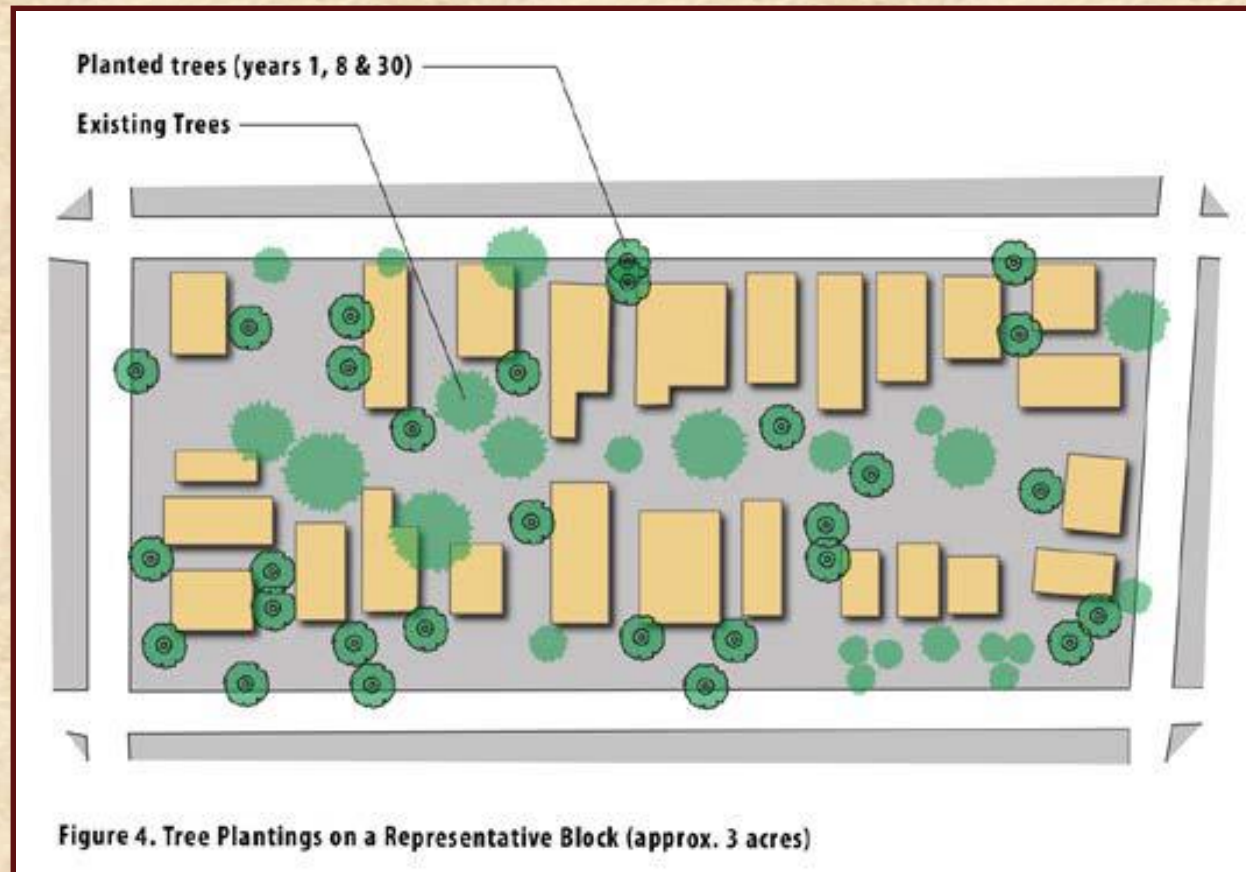
GGCP provides **energy justice!**



Older, less insulated housing benefits the most from shading and reduced wind speeds

How Does it Work?

- Target density is 5 trees per acre. Planting goal per crew is 800 trees a year for 3 years





Site Visits

- DCR: Urban Forester





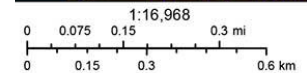
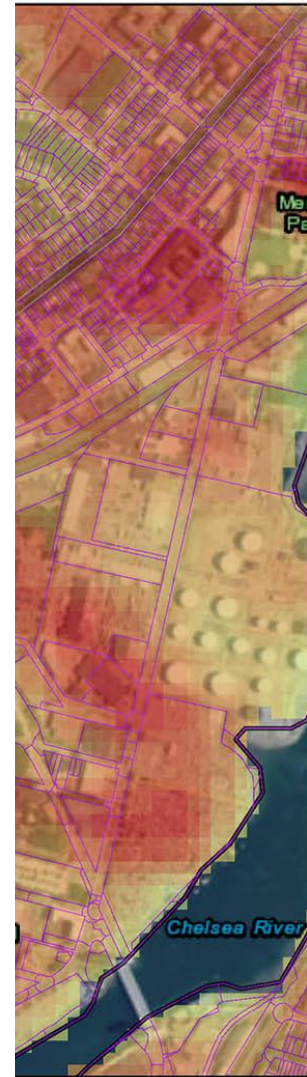
July 3, 2017

- Legend:
- Parcels (pink outline)
 - Jurisdiction (grey outline)
 - Study Area (blue outline)
 - High : 1 (orange)



Tree Density in Chelsea, MA

1,481 Trees as of Dec 2017



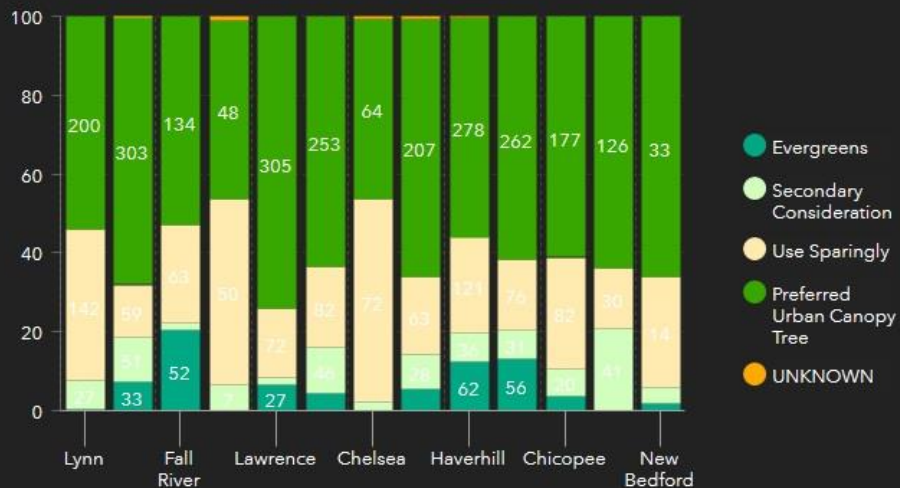
The Trust for Public Land
Copyright 2017



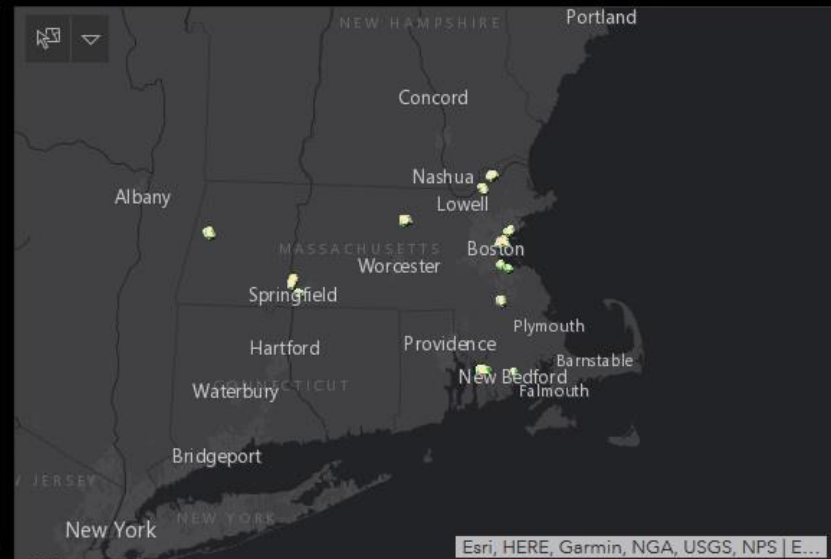


Spring 2018 - Planting Dashboard

Select Town: All of Program



Last update: a few seconds ago



Esri, HERE, Garmin, NGA, USGS, NPS | E...



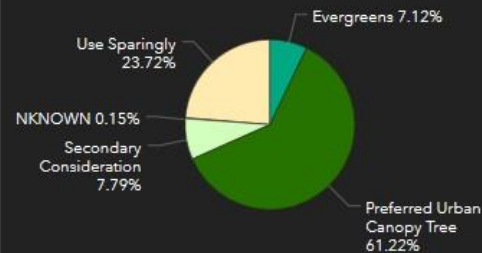
Last update: a few seconds ago

Top 5 Species

Species by Category

Total Trees Planted in Town: 3,904
▲ Percent of Total :100 %
Total Trees in Spring 2018: 3,904

Last update: a few seconds ago

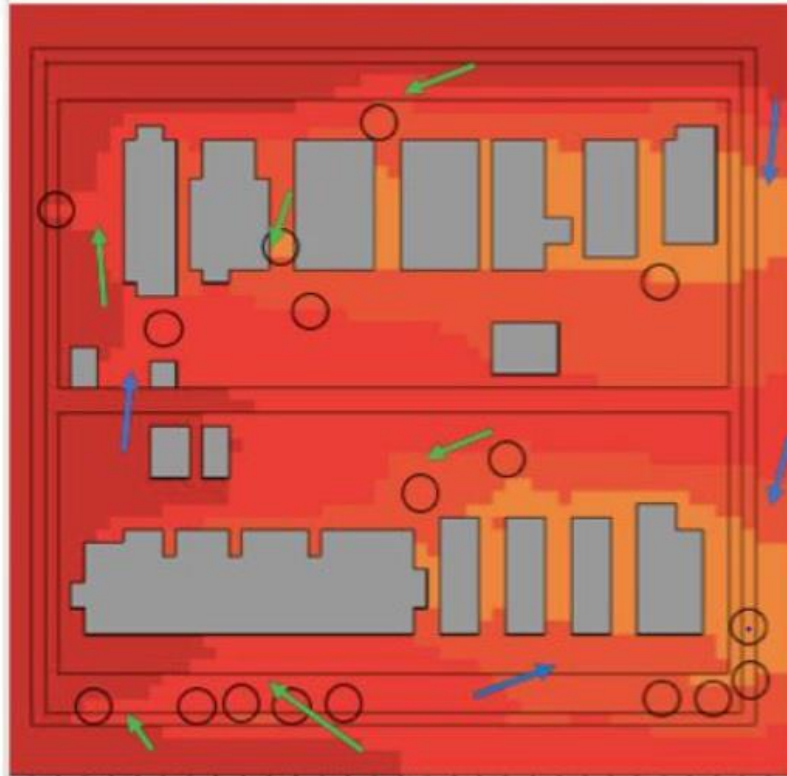


Last update: a few seconds ago

GGC Categories

Public Vs. Private

Original Site: Noon July 23rd



Min: 41.19°C

Max: 45.04°C

Average: 43.15°C



Sun

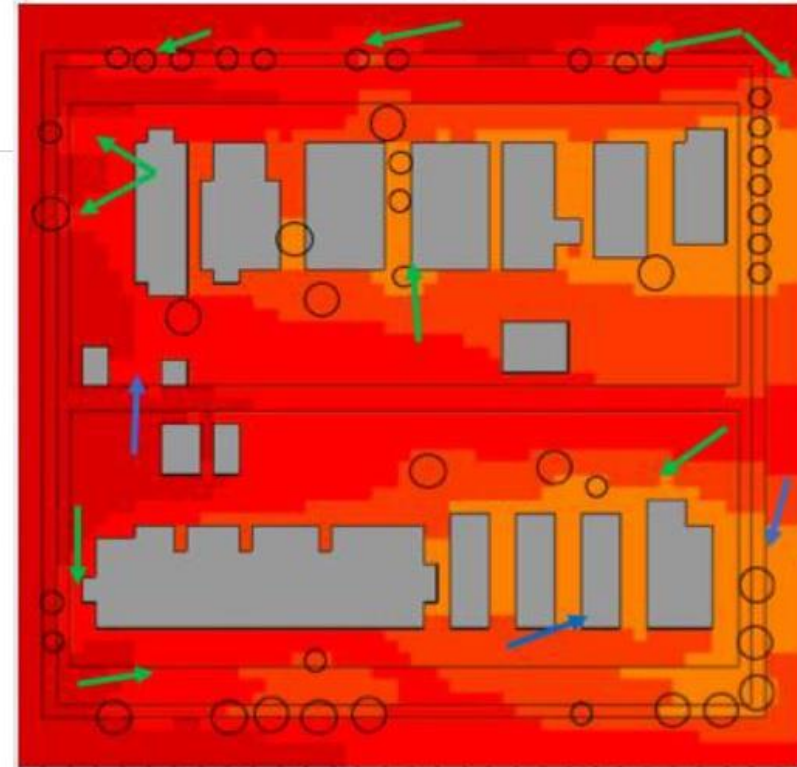
Air Temperature

- Below 40 °C
- 40 to 41 °C
- 41 to 42 °C
- 42 to 43 °C
- 43 to 44 °C
- Above 44 °C

Objects

- Buildings
- Grass
- Trees

After DCR Tree Planting: Noon July 23rd



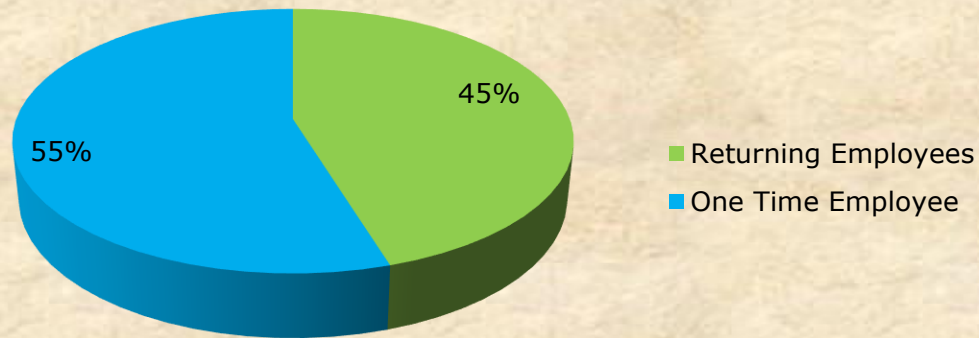
Min: 41.19°C

Max: 45.04°C

Average: 41.85°C

GGCP Local Workforce Development

252 Seasonal Employees Hired



- 114 seasonal employees (45%) have worked for the GGCP for two or more seasons, expanding their work experience and skill sets.
- 23 seasonal employees (10%) have gained full time employment after participating in the GGCP workforce development program.

