



Exploring Climate Solutions Webinar Series

Brought to you by the Governor's Council on Climate Change (GC3)

Archive: <https://portal.ct.gov/DEEP/Climate-Change/GC3/Webinars>

Special series:

Equity and Environmental Justice in Climate Solutions

Environmental Justice and the Urban Natural Environment

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CT Department of Energy and Environmental Protection
October 15, 2020



How Can We Support the Functioning of Nature in Urban Environments?



URI and AmeriCorps at Beaver Pond behind Bowen Field in New Haven



How Do We Use Nature to Improve the Livability of our Cities?



Hartford's Urban Forest - a Summary

Number of Trees: 568,000

Number of Larger Trees (over 20" in diameter): 55,000

Most Common Trees: red maple, tree of heaven, black cherry, American elm and red oak

Tree Canopy Cover: 26%

Amount of Carbon Removed by Hartford's Trees Annually: 2,440 tons

Amount of Major Air Pollutants Removed Annually: 73 tons

Oil Saved due to Energy Reduction by These Trees: 2,400 barrels a year

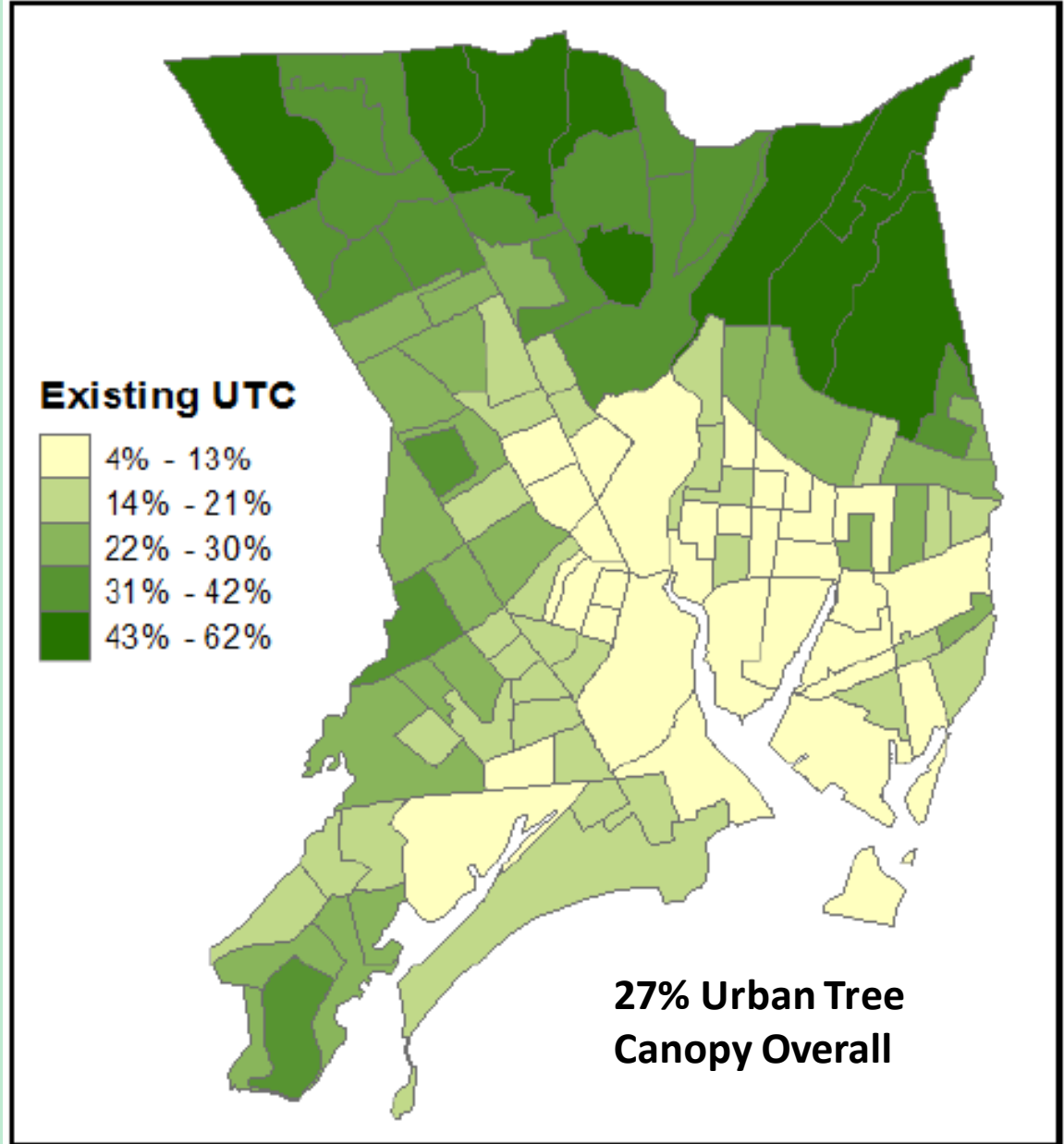
Replacement Cost for These Trees:
\$590 million dollars

How Does a City Deal with the Natural Environment as Part of its Normal Functioning?



City of Bridgeport

- 19.4 square miles total
- 16.0 square miles land area
- 144,399 population
- 8,720.9/sq mi population density
- 42.7 in. annual average precipitation
- 121.7 average # of days with precipitation
- 92.9° F – mean high temperature (July)
- 23.0° F – mean low temperature (January)



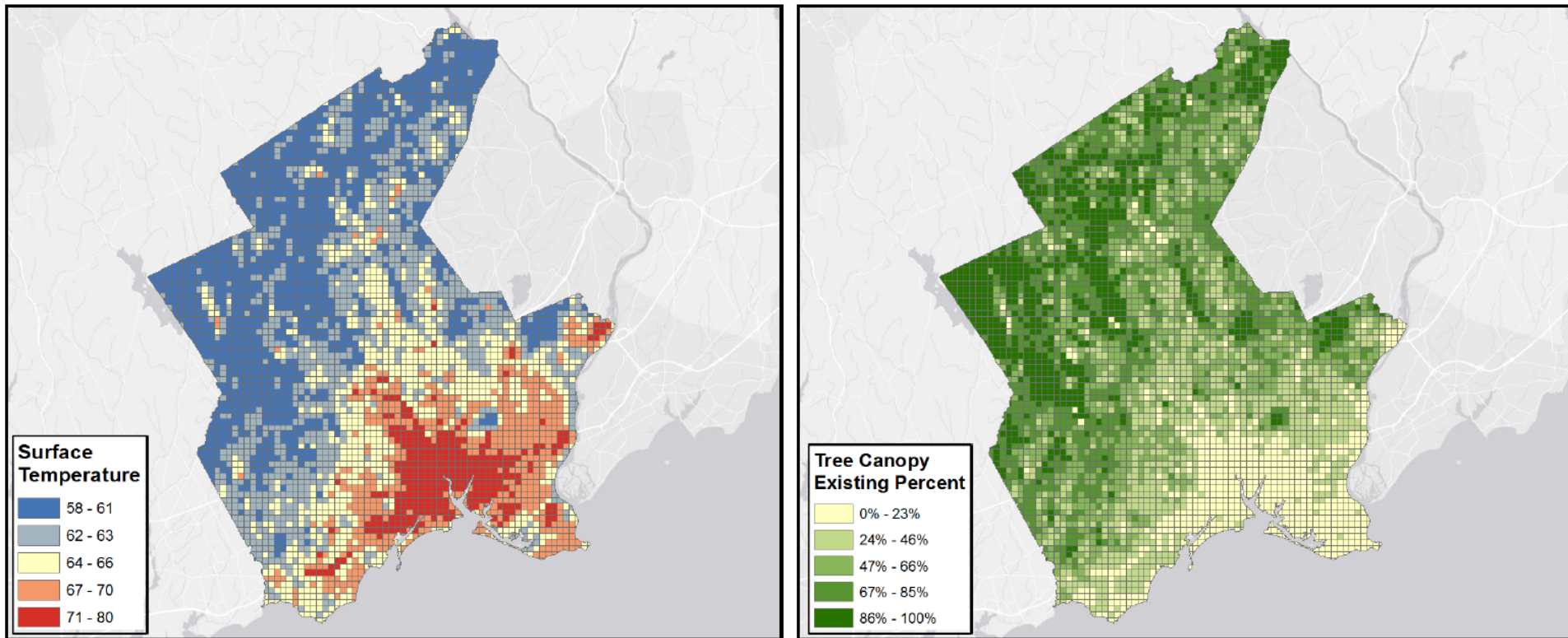


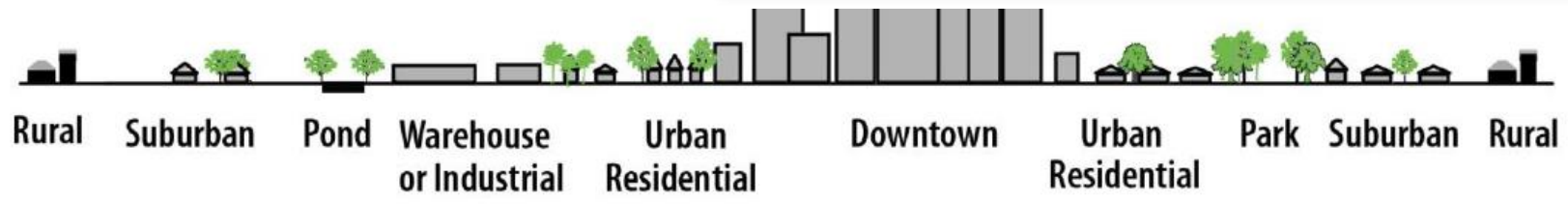
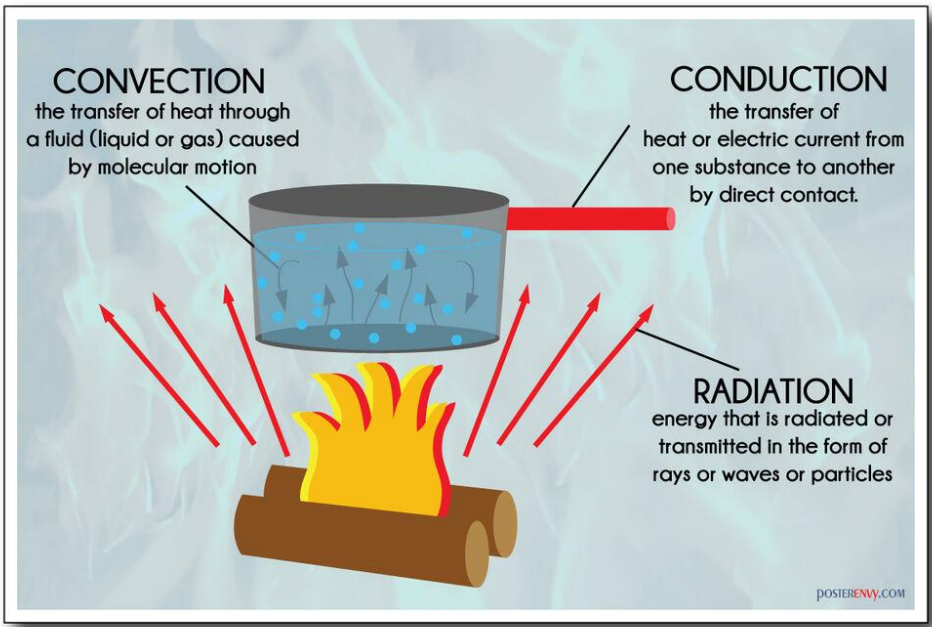
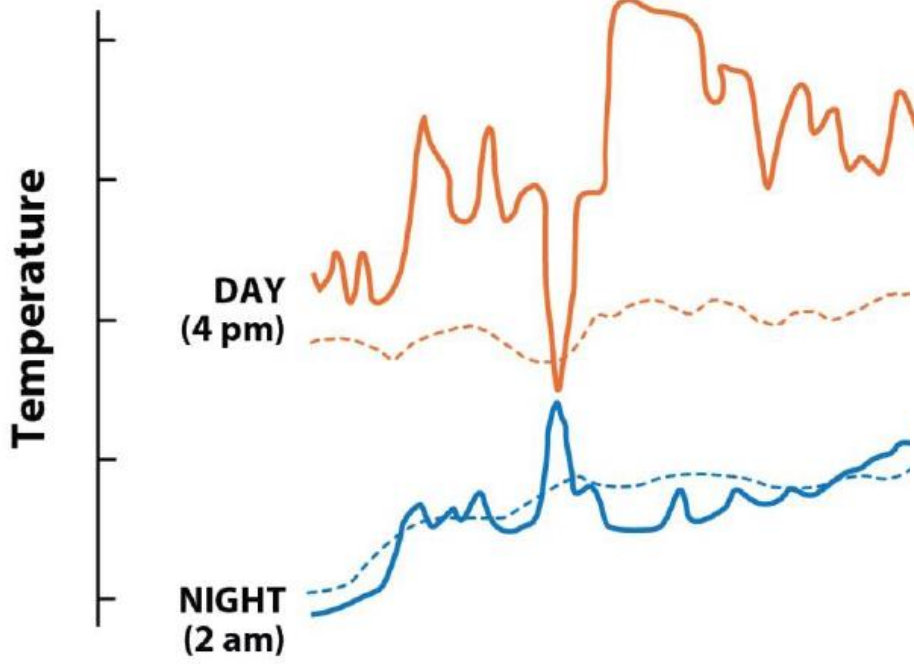
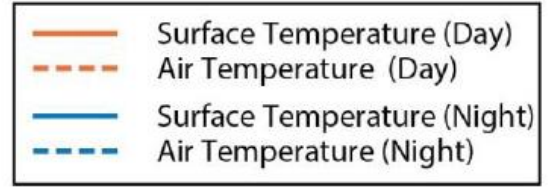
Figure 8: Surface temperature, degrees Fahrenheit on October 3, 2014 (left) in comparison with Existing Tree Canopy (right).

The Urban Heat Island Effect

Potentially 22 degree temperature difference between the urban center and outlying areas

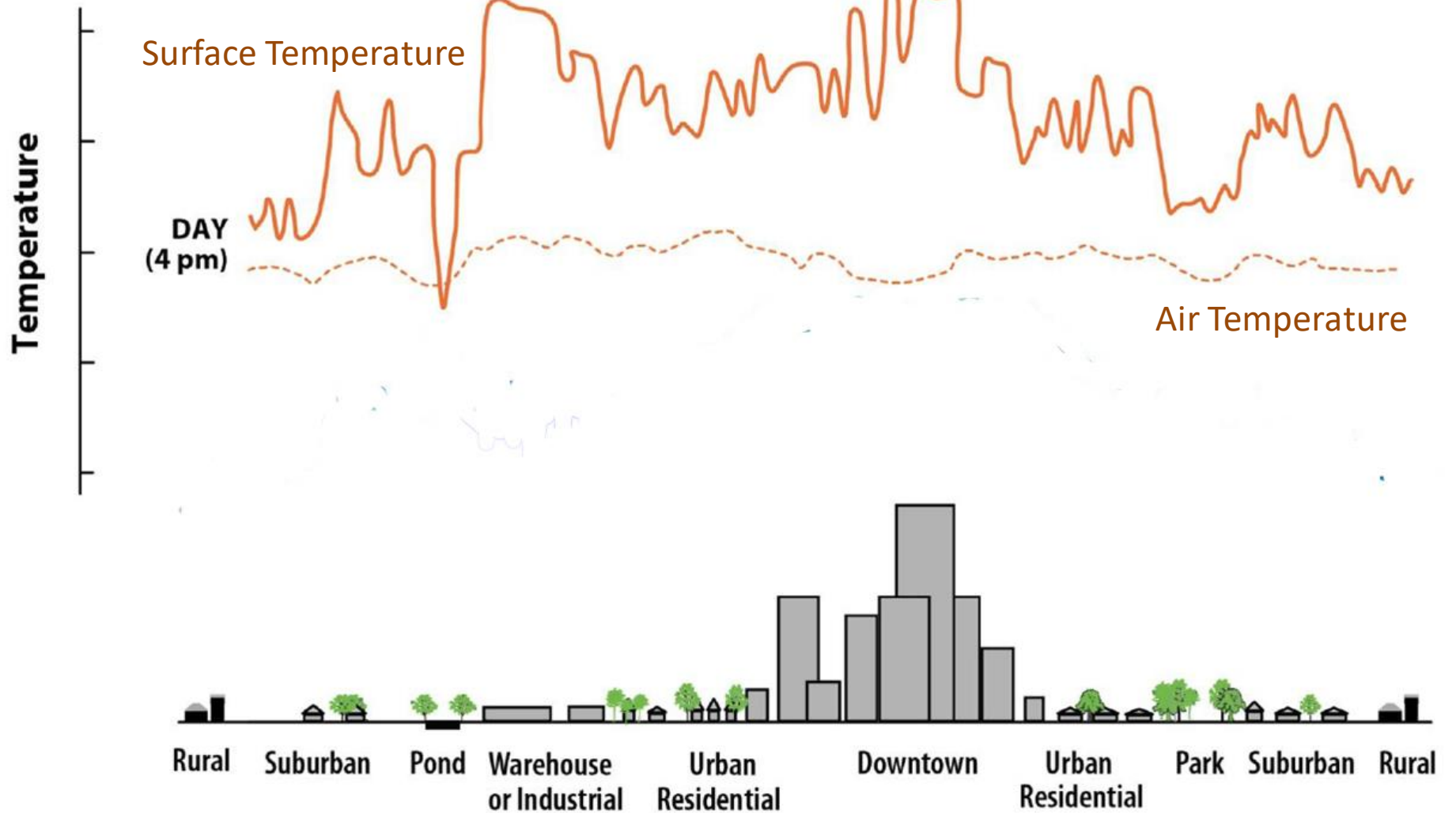
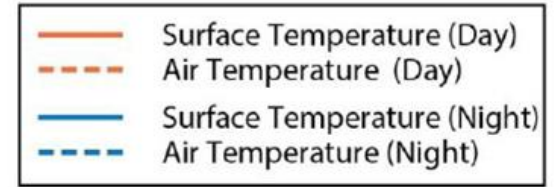
Typical Heat Island Temperature Differences Between Urban and Rural Areas

source: <https://www.epa.gov/heatislands>



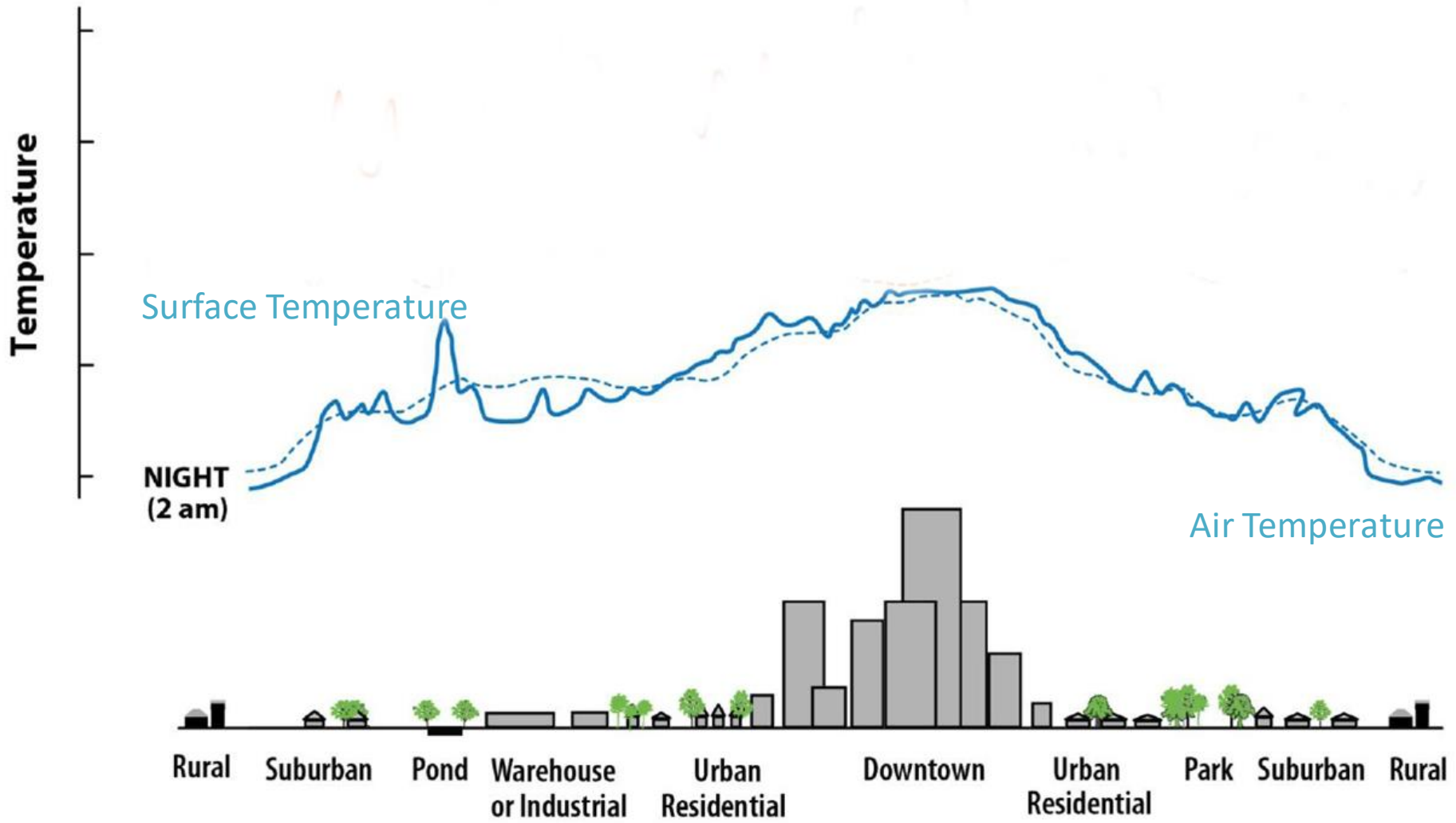
Typical Heat Island Temperature Differences Between Urban and Rural Areas

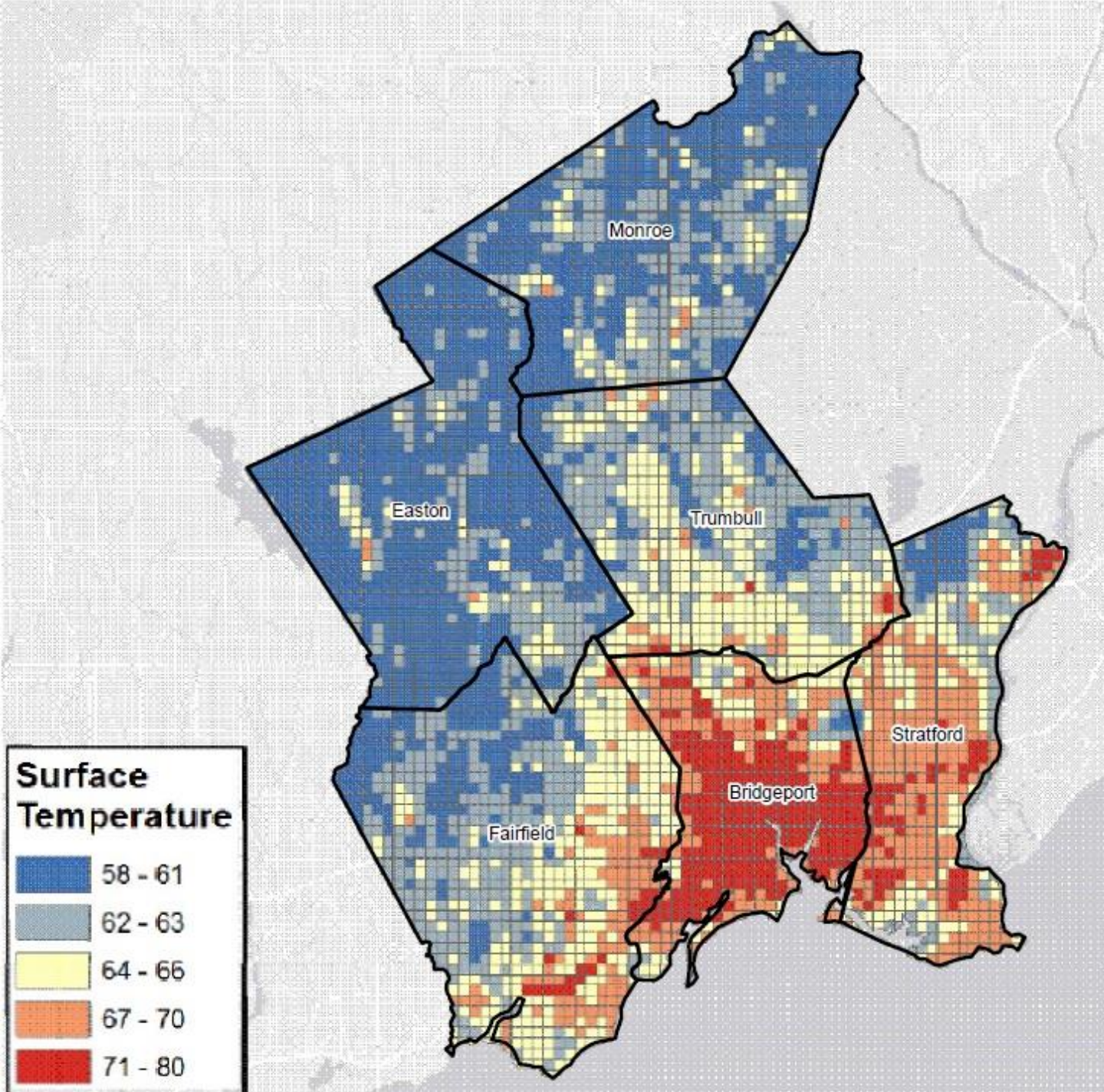
source: <https://www.epa.gov/heatislands>



Typical Heat Island Temperature Differences Between Urban and Rural Areas

- Surface Temperature (Day)
- - - Air Temperature (Day)
- Surface Temperature (Night)
- - - Air Temperature (Night)





**Reported
Temperature
(Air Temp.) :**

High: 65° F

Low: 51° F

**Readings
Taken at Igor
Sikorsky
Airport**

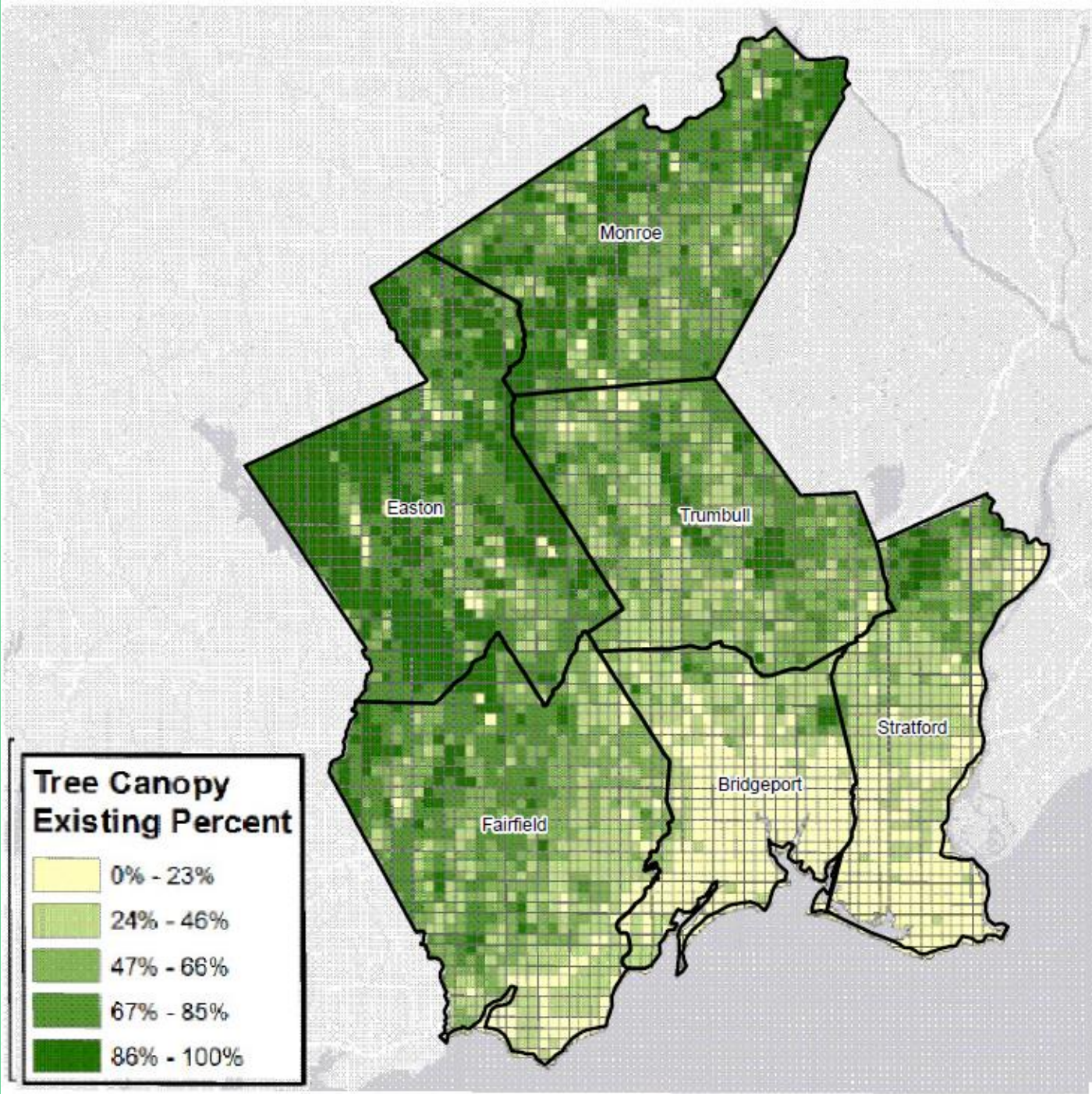


BAKERY

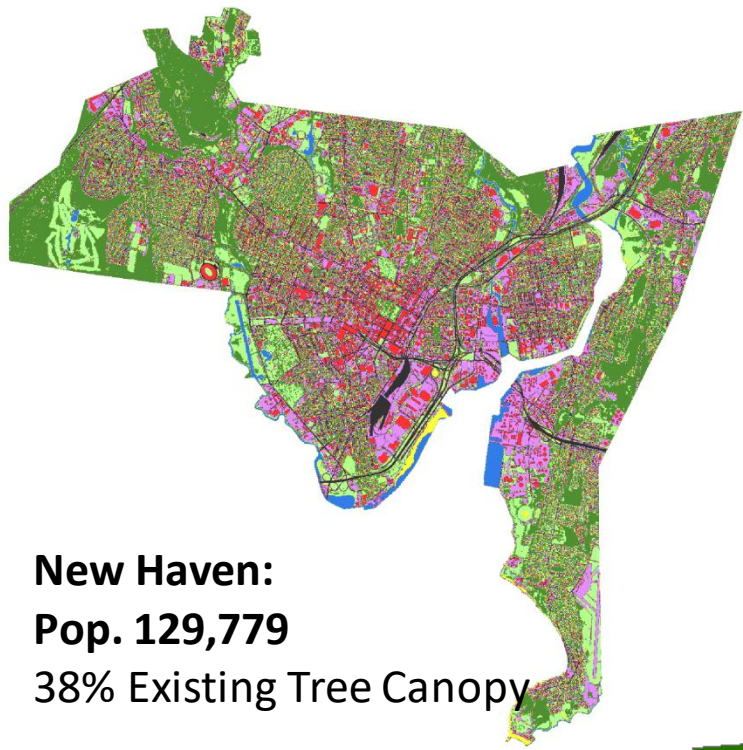


Southampton
Crescent Park
East End
South Ferry
Brooklyn



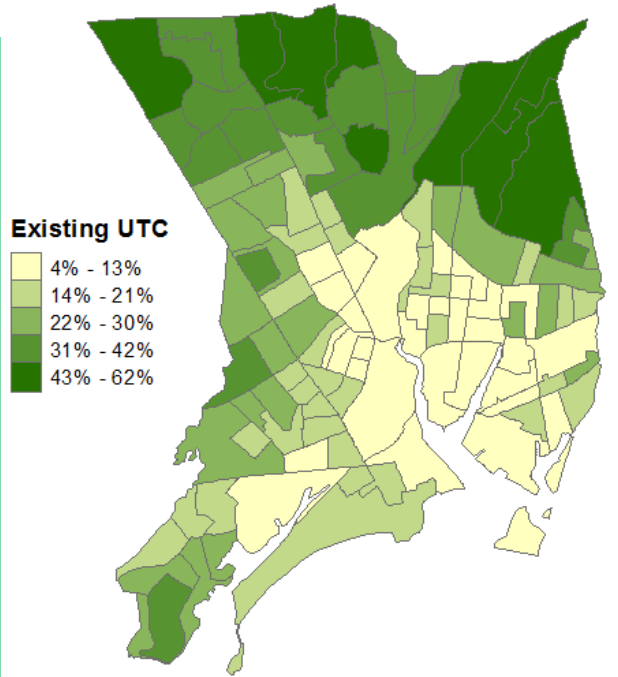
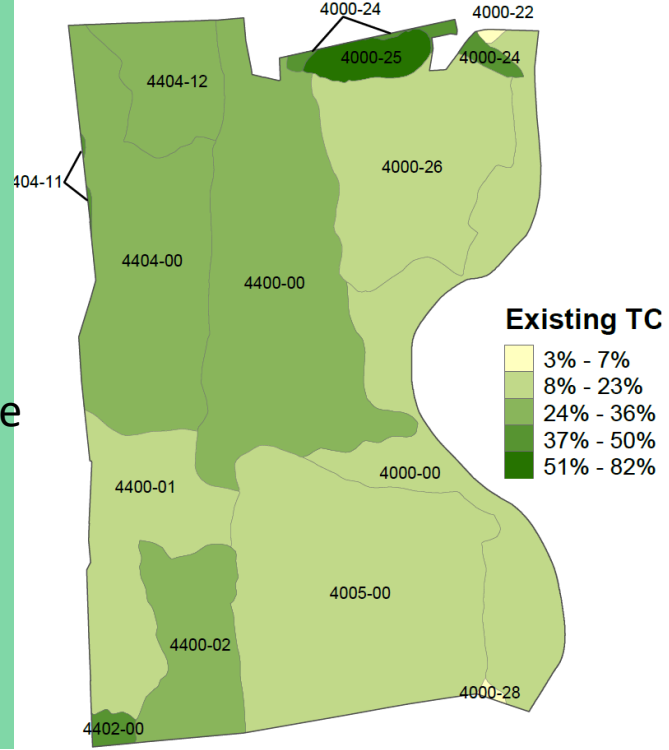






New Haven:
Pop. 129,779
 38% Existing Tree Canopy

Hartford:
Pop. 124,775
 26% Existing Tree Canopy



Bridgeport:
Pop. 144,229
 27% Existing Tree Canopy

Existing UTC

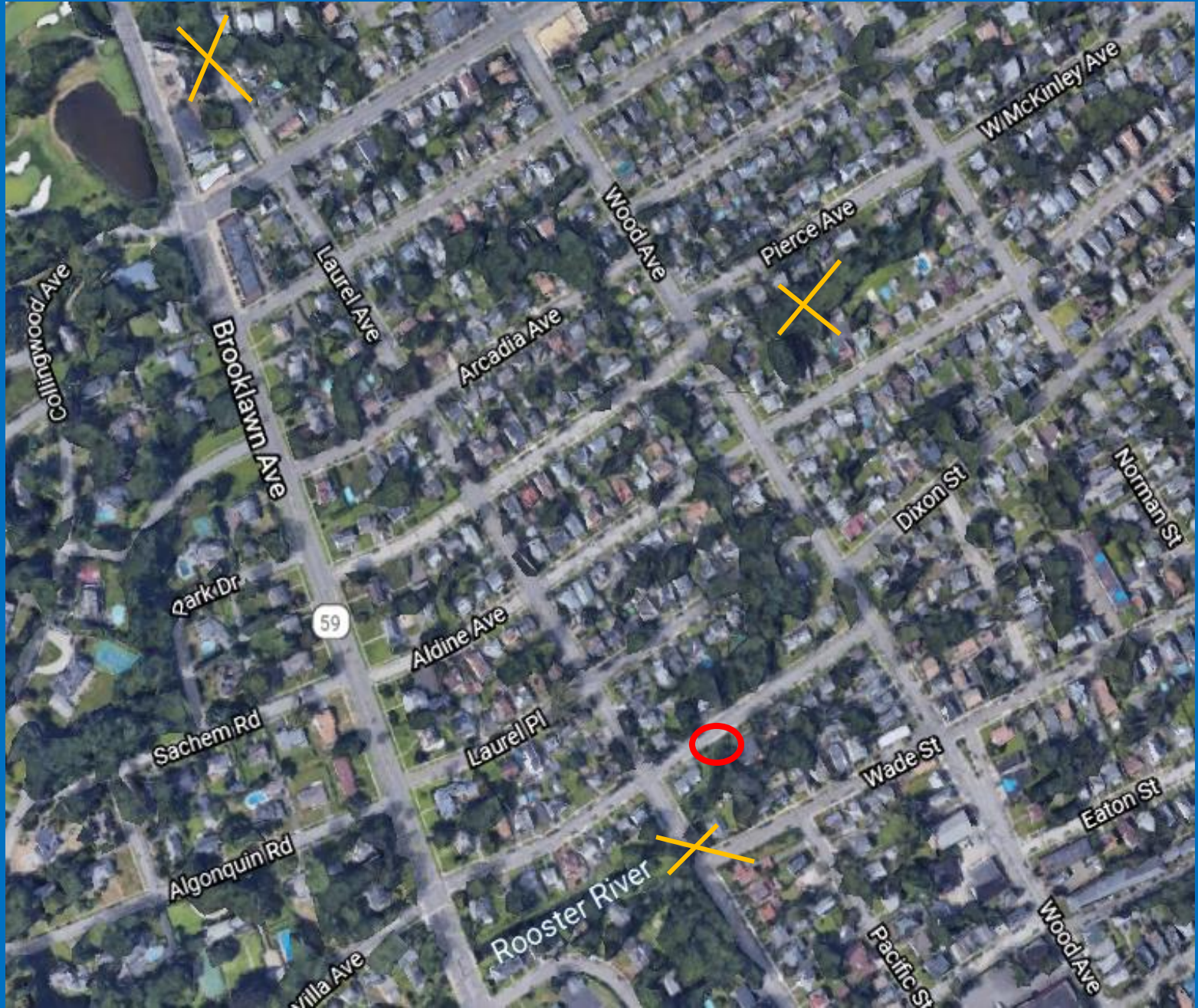
Lightest Green	4% - 13%
Light Green	14% - 21%
Medium Green	22% - 30%
Dark Green	31% - 42%
Darkest Green	43% - 62%

My thinking of the urban heat island effect:

- The term refers to the general fact that urban areas are warmer than rural areas. We also need to pay attention to the local effects, the urban hotspots, which are not uniform across the city.
- Because of the role of trees in reducing local urban heat island effects, we need to consider tree planting as a strategy. We should do the same regarding reducing impervious surfaces.
- We should also be looking at the other factors that influence heat build-up in the city – factors such as building geometry and air flow.



Rooster River



ROOSTER RIVER Watershed Based Plan

September 2013

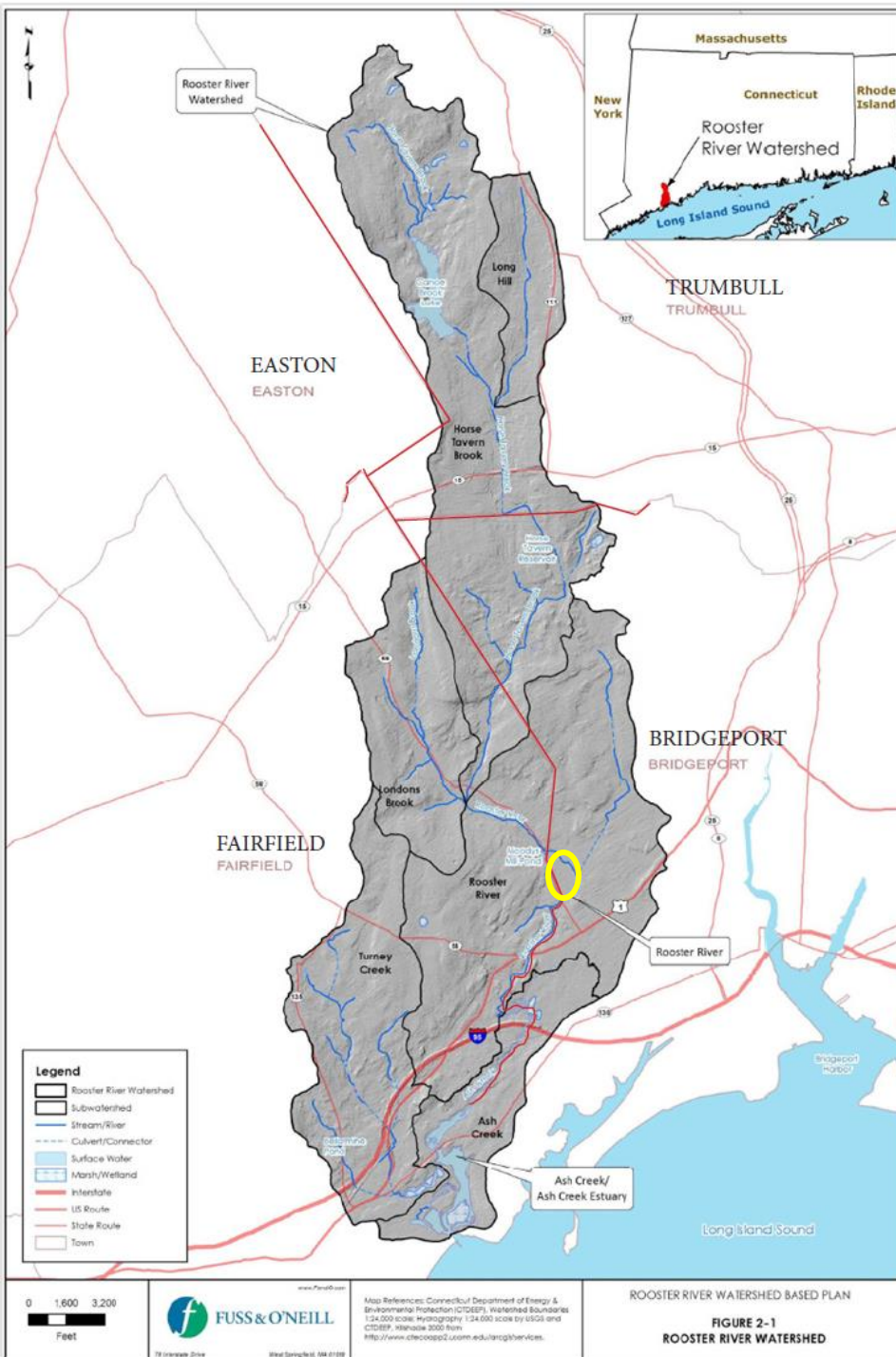


Prepared by
 FUSS & O'NEILL



The Rooster River Watershed

- Primarily in 3 Towns
- 9,813 acres total
- 33.2 miles of stream
- 80,452 people
- 5,284 population density
- 49% single family residential
- 32% mapped impervious surface
- 23% effective impervious surface



Watershed Management Goals

- **Goal 1 – Capacity Building for Plan Implementation**
 - Municipal, NGOs, residents, local businesses, others
- **Goal 2 – Water Quality Improvements**
 - Storm water management , wastewater discharges, riparian buffer restoration
- **Goal 3 – Habitat Protection and Restoration**
 - Riparian buffer restoration, reduce invasive plants, protect forested areas
- **Goal 4 – Sustainable Land Use and Open Space**
 - Resource and recreational goals, including reduced flooding
- **Goal 5 – Education and Stewardship**
 - Awareness and Outreach

Distribution of Load Reductions by Management Recommendation

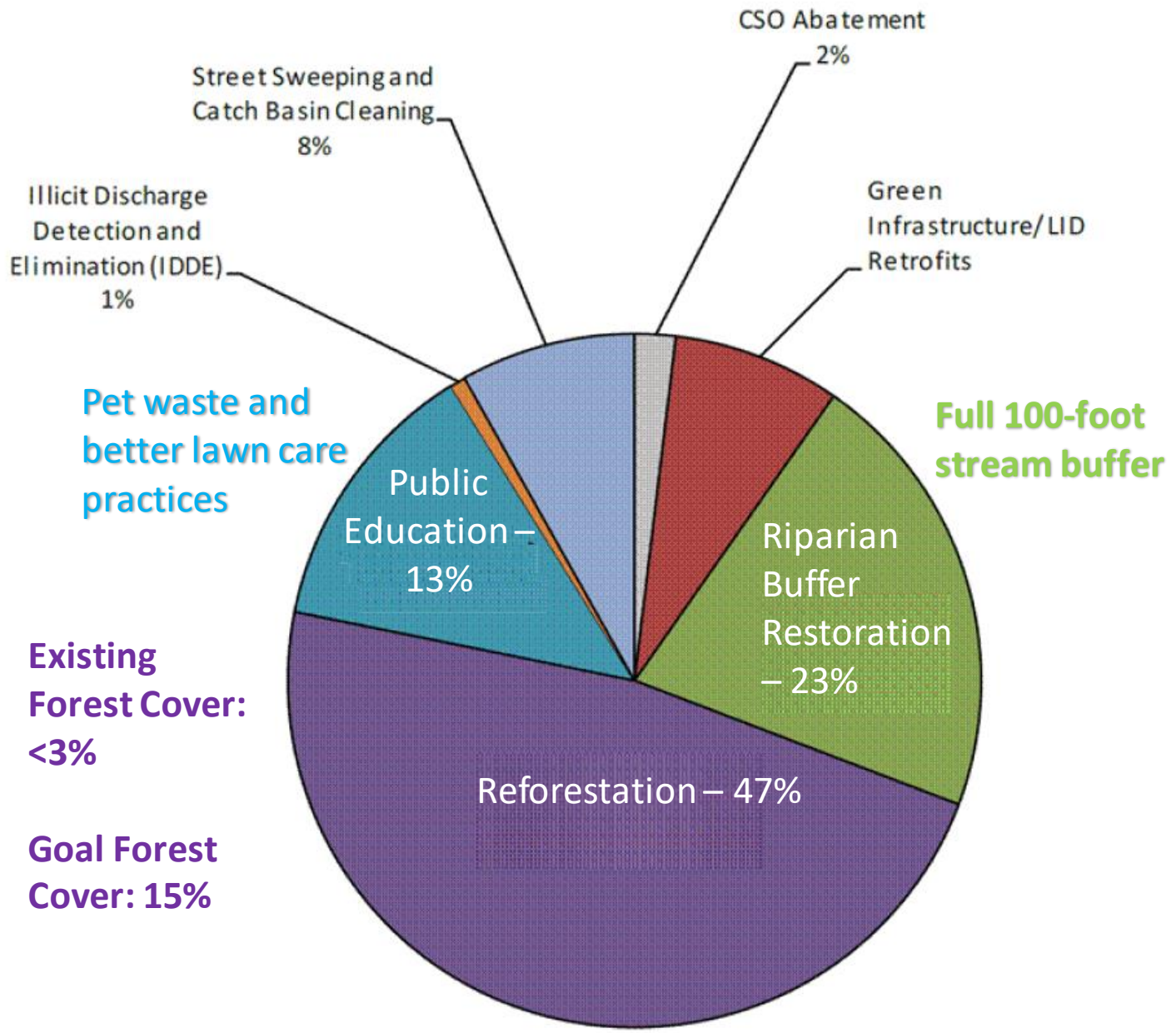


Figure 5-1. Anticipated Nitrogen Loads and Load Reductions







A bulletin board is mounted on the wall to the right of the map. It features several posters and notices. The top poster is titled "Sustainable, Better Every Day" and includes a list of bullet points. Below it is a poster for a "SALVAGE & JUNKY JANUARY 24TH COMMUNITY PLANNING WORKSHOP". The middle poster is titled "URBAN NATURE AS A HEALTH RESOURCE" and features a photograph of a person walking in a park. The bottom poster is for the "BANFF MOUNTAIN FILM FESTIVAL WORLD TOUR" and includes the date "FEBRUARY 21" and "11:00 PM".



WITSPON
TRUCKS

527AY

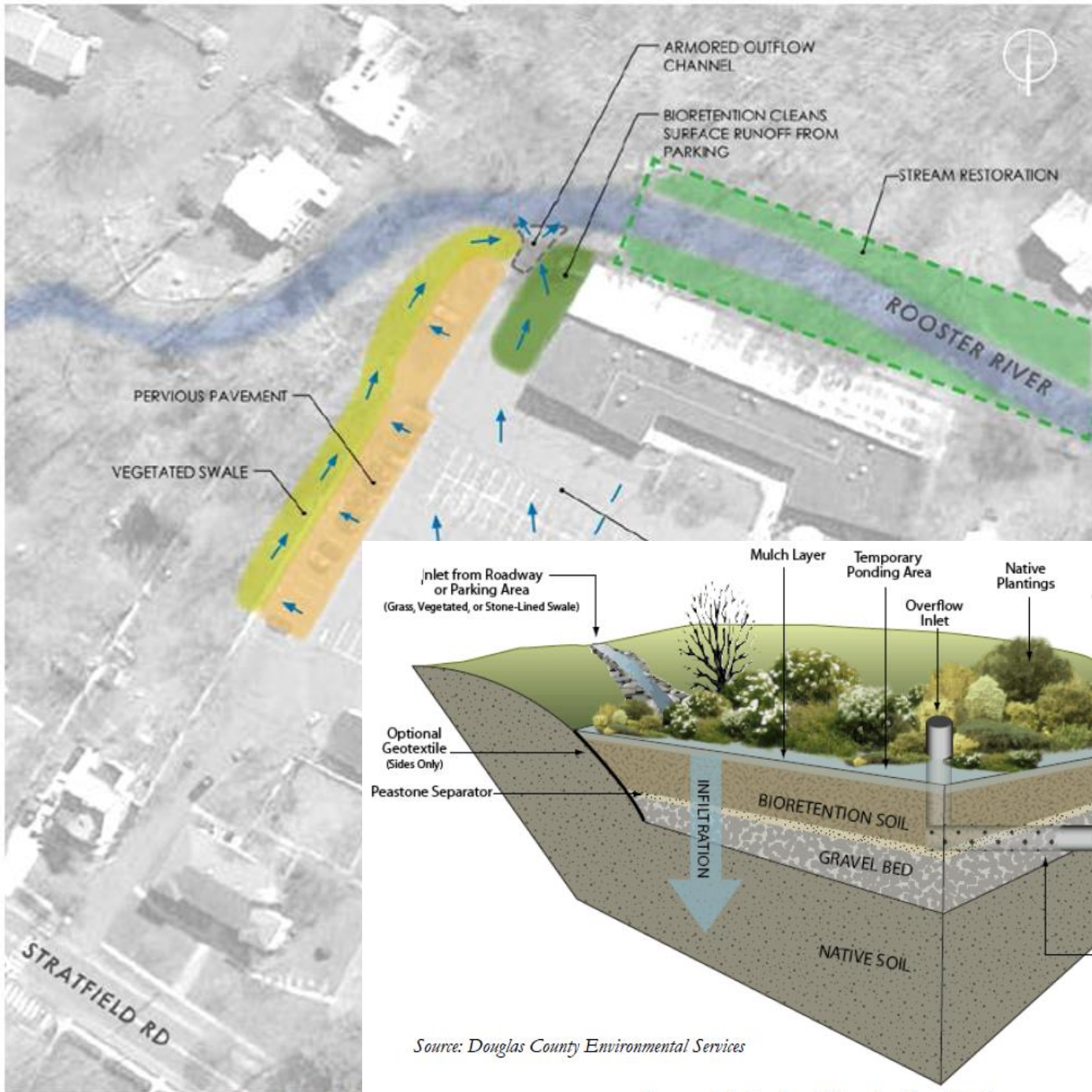


Figure 4-2. Re

Figure 4-4. Typical Bioretention Design

Source: Douglas County Environmental Services

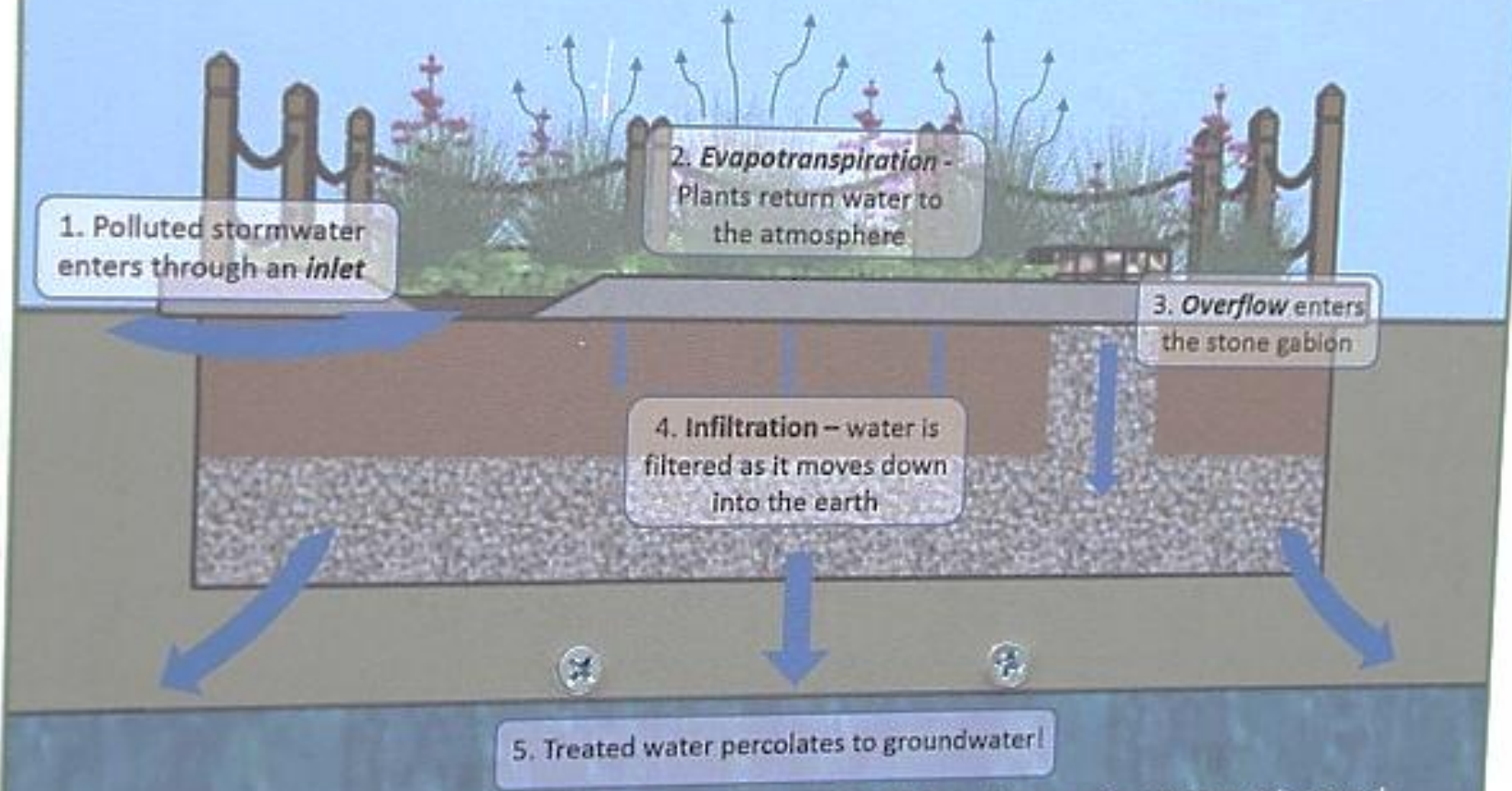


<https://hixon.yale.edu/practice/bioswales>



Apicella's

BIOSWALES use plants and soil to capture stormwater from streets and sidewalks, **reducing flooding and capturing pollutants.**



This bioswale can manage more than 75,000 gallons of water each year!





Benefits of Trees

Hartford Street Trees – 2019 Inventory

- Number of Trees: 22,029
- CO2 Avoided: 2,200 tons
- CO2 Sequestered: 1,830 tons
- Stormwater Diverted: 33,130,000 gal.
- Energy Savings: 1,876,000 KWh
- Air Pollution Removed: 15 tons

Total Value of the Above: \$1,668,655





ROAD
CONSTRUCTION
AHEAD









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ONE WAY

WEST S. Church

SOLUNA

References

- <https://portal.ct.gov/DEEP/Forestry/Urban-Forestry/Trees-and-Urban-Forests> (DEEP's general urban forestry page)
- https://portal.ct.gov/-media/DEEP/forestry/urban_forestry/GreaterBridgeportTreeCanopyReportpdf.pdf (Greater Bridgeport Urban Tree Canopy Cover Study (6 towns))
- https://portal.ct.gov/-/media/DEEP/forestry/urban_forestry/UForeFlyerLetterpdf.pdf (Hartford's 2007 Full Urban Forest Report (short version))
- [Connecticut's Rapid Loss of Urban Trees Could have Long Term Consequences](#) (Hartford Courant Article)
- [US Cities lose Tree Cover Just When They Need it Most](#) (Scientific American article)
- <https://www.vibrantcitieslab.com/> (A major resource for references to the full range of topics relating to trees and urban forests)
- <https://www.epa.gov/heatislands> (EPA's website on Urban Heat Islands)
- <https://portal.ct.gov/DEEP/Water/Watershed-Management/Watershed-Management-Plans-and-Documents> (DEEP Watershed Management Plans – includes the Rooster River)
- <https://uri.yale.edu/programs/green-infrastructure> (New Haven's bioswales, including details on construction)
- www.iTreeTools.org (free suite of software tools for quantifying the benefits that can come from urban trees; developed by the US Forest Service)
- <https://www.fs.fed.us/research/urban/humanhealth.php> (US Forest Service web site on the connection between 'urban nature and human health and well-being'. Includes a link to an important publication summarizing that connection.)
- <https://www.theguardian.com/cities/2016/oct/12/importance-urban-forests-money-grow-trees> ("The importance of urban forests; why money really does grow on trees", article from the Guardian)
- <https://drive.google.com/file/d/0B8PXolehHWSkRVlwMHVfbUM4c0U/view> (Why Opt-in to a Planting Program? Long-term Residents Value Street Tree Aesthetics; Dexter Locke & others (focus on New Haven

Thank you – Chris Donnelly, Urban Forester
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