Percent Impervious Surface
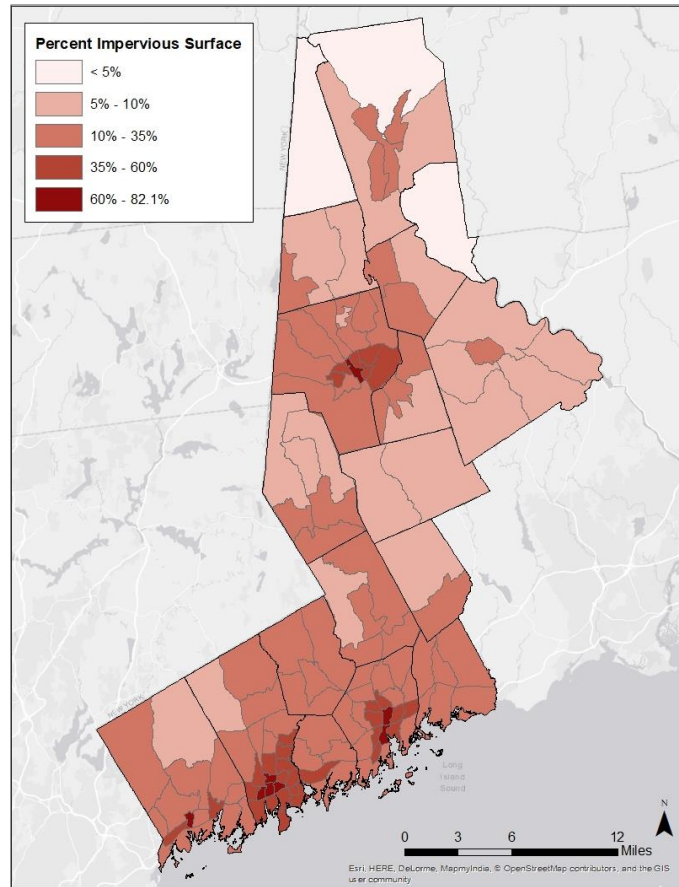- < 5%
- 5% - 10%
- 10% - 35%
- 35% - 60%
- 60% - 82.1%

Impervious surface is land which water cannot percolate through, such as buildings, pavement, and cement. Impervious surface is also produces the urban heat island effect and increases stormwater runoff which leads to surface water pollution and flooding. Healthy tree coverage can mitigate these negative impacts.

Using imagery from 2015, WestCOG found that 13.1% of the Region is covered in impervious surface. This accounts for 46,329 acres of 352,206 acres. The three cities in the Region, Norwalk, Stamford, and Danbury, predictably, have higher impervious surface coverage. Darien, Westport, and Greenwich also have higher impervious surface coverage since they are urbanized areas with a considerable about of transportation infrastructure running through them such as I-95, Route 1, and Metro North.

The map shows that city centers in the Region have more impervious surface coverage than the neighborhoods just outside of them. Town centers, such as, New Canaan, Ridgefield, and New Milford also tend to have higher impervious surface coverage than the rest of their respective towns. Roads and parking areas to accommodate visitors may account for a substantial portion of the impervious surface.

Street Trees

Table 5: Maximum Street Tree Potential

	Potential Acres of Street Trees	Percent of Total Acres	Potential Trees
Danbury	1,168.0	4.15%	161,950
Greenwich	1,114.8	3.59%	154,573
New Milford	1,010.0	2.47%	140,042
Stamford	910.9	3.70%	126,302
Newtown	861.4	2.29%	119,438
Norwalk	836.2	5.67%	115,944
Westport	584.0	4.52%	80,975
Ridgefield	571.2	2.56%	79,200
Brookfield	488.5	3.75%	67,733
New Fairfield	342.4	2.13%	47,476
Bethel	335.2	3.09%	46,477
Darien	331.1	4.07%	45,909
New Canaan	320.1	2.22%	44,384
Wilton	286.3	1.64%	39,697
Redding	262.6	1.28%	36,411
Sherman	205.1	1.37%	28,438
Weston	196.2	1.48%	27,204
Bridgewater	124.4	1.12%	17,249
WestCOG	**9,948.4**	**2.82%**	**1,379,403**

When planted near impervious surfaces, trees can mitigate negative impacts by absorbing water and slowing rain flow, as well as shading surfaces and cooling them. Street trees can also make these areas more attractive places to residents and visitors.

Planting trees along streets could provide the largest return on investment. Danbury, Greenwich, New Milford, Stamford, Newtown, and Norwalk can gain the most tree canopy acreage by planting along available street space (Table 5). Norwalk (5.67%), Westport (4.52%), Danbury (4.15%) Darien (4.07%), Brookfield (3.75%), and Stamford (3.70%) would see the largest percent increases. If trees covered all available street tree space, the Region would gain nearly 10,000 acres of canopy, an increase of almost 3%, an estimated 1,379,403 trees. **This increase will provide an estimated $62.3 million in annual benefits, and an estimated $1 billion in lifetime stored carbon dioxide benefits.**

For a more detailed description of the research and data in this brief, please view the full WestCOG Regional Canopy Analysis.
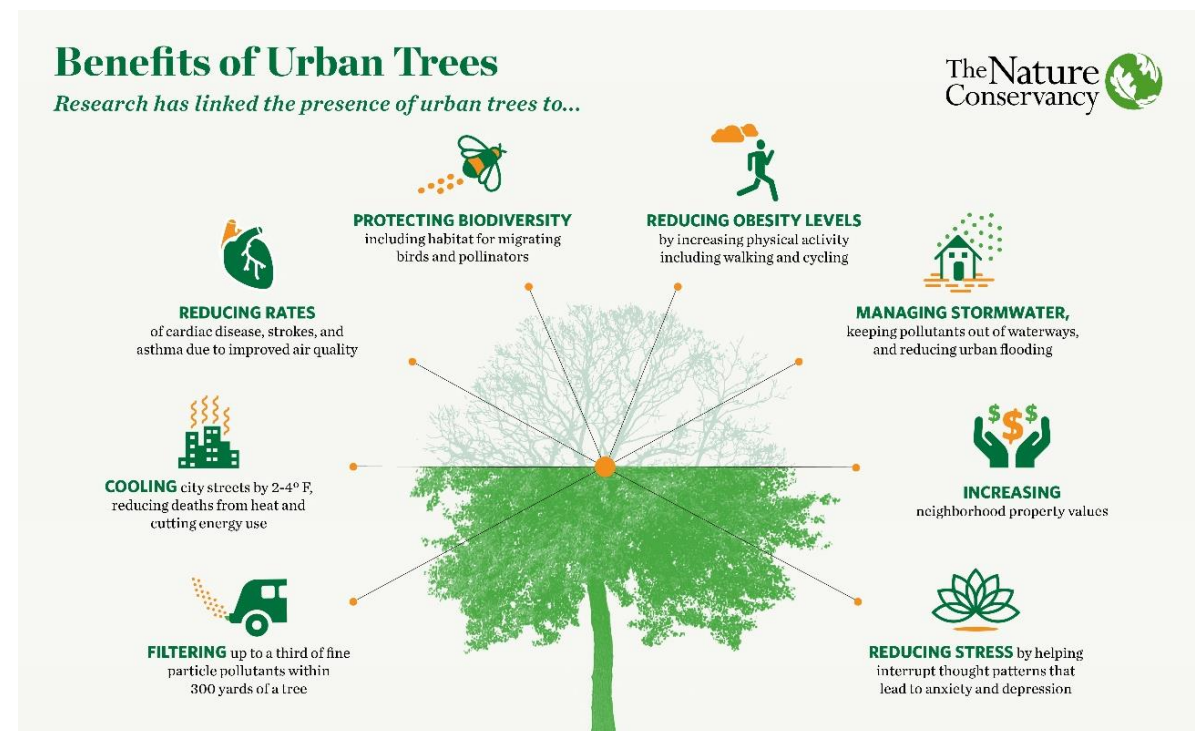
Regional Tree Canopy Analysis - 2018

Why are trees important?
Trees are key to a healthy region. A flourishing urban tree canopy provides an array of benefits and services, falling under three main categories:

- ❖ Environmental services – stormwater mitigation, air quality mitigation, ecological balance;
- ❖ Social enhancement – improved mental and physical health, contributing to a sense of place;
- ❖ Economic growth – increased housing prices, amplified commercial income.

These benefits give cities and towns strong incentives to maintain robust tree canopies. Understanding the positive outcomes of planting trees and embracing the importance of trees in the landscape can help improve the Region.

Benefits of Urban Trees
Research has linked the presence of urban trees to...

The Nature Conservancy

PROTECTING BIODIVERSITY including habitat for migrating birds and pollinators

REDUCING OBESITY LEVELS by increasing physical activity including walking and cycling

REDUCING RATES of cardiac disease, strokes, and asthma due to improved air quality

MANAGING STORMWATER, keeping pollutants out of waterways, and reducing urban flooding

COOLING city streets by 2–4° F, reducing deaths from heat and cutting energy use

INCREASING neighborhood property values

FILTERING up to a third of fine particle pollutants within 300 yards of a tree

REDUCING STRESS by helping interrupt thought patterns that lead to anxiety and depression

WESTCOG

Using imagery from 2015, WestCOG found that 61.2% of the Region is covered in tree canopy. This accounts for 215,536 acres of 352,206 acres. The three cities, Danbury, Norwalk, and Stamford, predictably have lower canopy coverage. Westport, Darien, and Greenwich also have low canopy coverage as they are also more urbanized areas.

Using iTree, a state-of-the-art, peer-reviewed software suite from the USDA Forest Service, WestCOG estimated the financial benefits that the current canopy coverage and several increases in canopy scenarios could provide. (Tables 2 & 4)

Currently, the Region's tree canopy provides nearly $59.6 million in annual benefits and nearly $1 billion in lifetime stored carbon benefits.

Table 1: Current Canopy Coverage

Canopy Coverage	
Norwalk	39.2%
Westport	47.1%
Darien	47.7%
Greenwich	49.4%
Stamford	50.2%
Danbury	52.0%
Brookfield	59.5%
New Fairfield	60.0%
New Canaan	60.5%
WestCOG	**61.2%**
New Milford	62.7%
Bethel	63.8%
Bridgewater	68.1%
Ridgefield	68.5%
Wilton	70.7%
Sherman	71.2%
Newtown	71.5%
Weston	74.7%
Redding	78.3%

Current Canopy Coverage
- 5.6% - 10%
- 10.1% - 25%
- 25.1% - 50%
- 50.1% - 75%
- 75.1% - 94%

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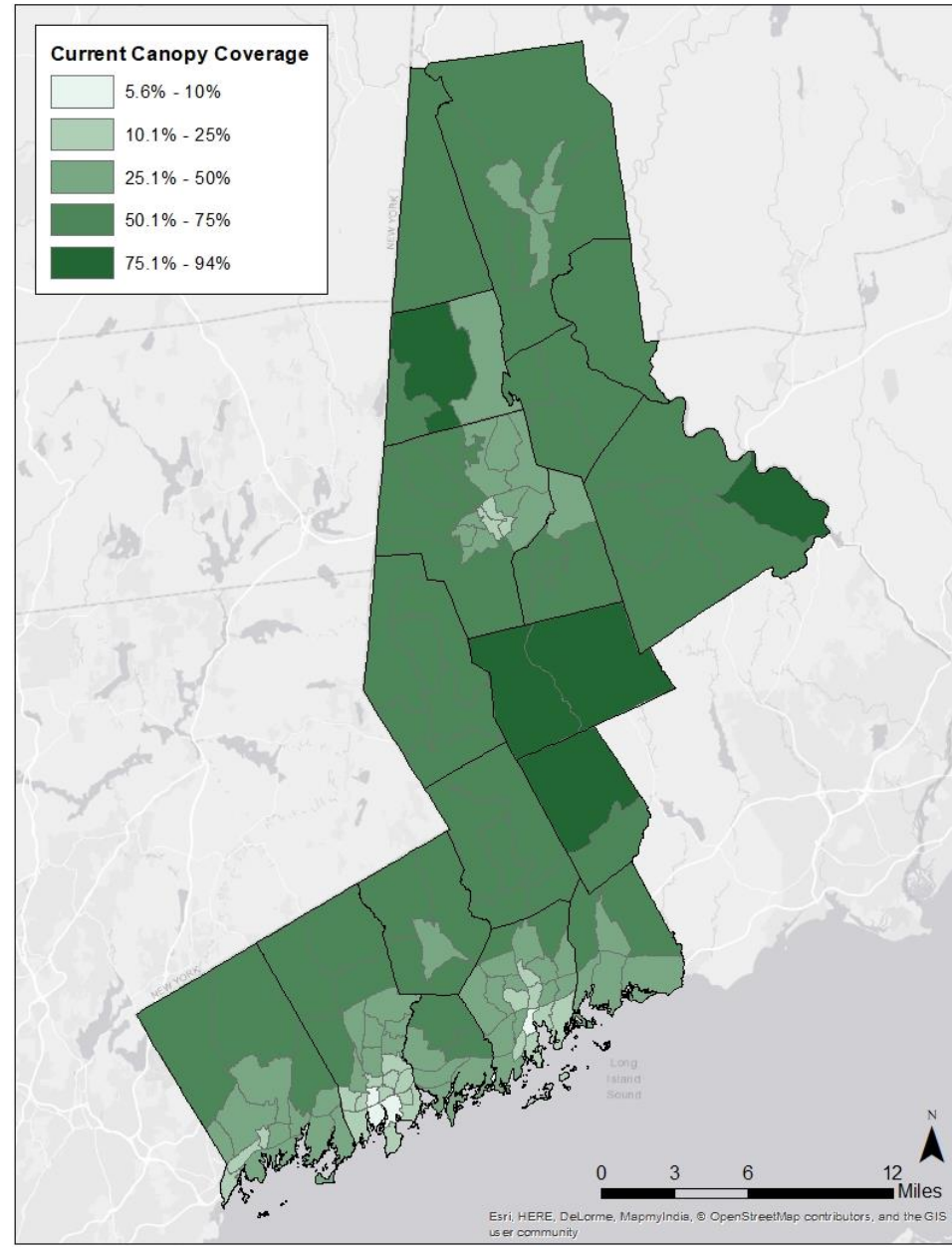
Table 2: Current Canopy Benefits

Benefit Type (Annual)	Current Estimate
Carbon Monoxide (CO)	$152,993
Nitrogen Monoxide (NO$_2$)	$241,570
Ozone (O$_3$)	$8,991,366
Particulate Matter < 2.5 microns (PM2.5)	$3,910,772
Sulfur Dioxide (SO$_2$)	$16,470,923
Particulate Matter 10 < 2.5 microns (PM10*)	$21,491
CO$_2$ sequestered in trees	$29,790,326
Total each year	$59,579,441
CO$_2$ stored in trees (not annual)	$958,525,531

Potential Canopy Coverage
- 17.9% - 25%
- 25.1% - 50%
- 50.1% - 75%
- 75.1% - 94%

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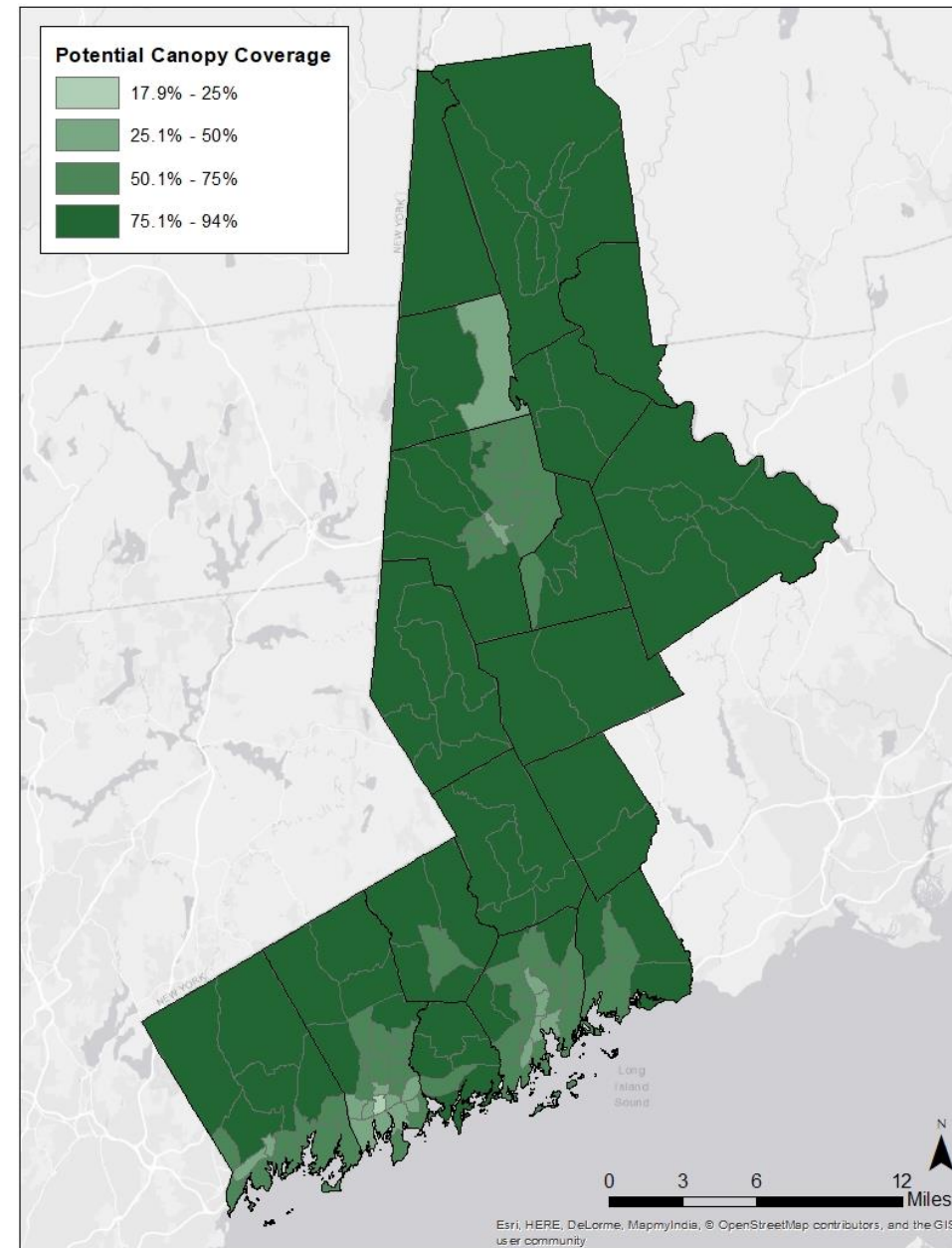
Table 4: Maximum Canopy Benefits

Benefit Type (Annual)	Potential Estimate
Carbon Monoxide (CO)	$402,999
Nitrogen Monoxide (NO$_2$)	$636,319
Ozone (O$_3$)	$23,684,141
Particulate Matter < 2.5 microns (PM2.5)	$10,301,358
Sulfur Dioxide (SO$_2$)	$43,386,027
Particulate Matter 10 < 2.5 microns (PM10*)	$56,610
CO$_2$ sequestered in trees	$78,470,645
Total each year	$156,938,099
CO$_2$ stored in trees (not annual)	$2,524,850,384

Given the benefits trees provide, municipalities may wish to consider increasing their canopy coverage when possible.

To estimate how much land could be planted to contribute to the tree canopy, the amount of available land, which is not impervious surface, water, within 30 feet of a telephone pole, or currently canopied must be identified. Table 3 shows how large the canopy could be if all the available land was reforested. It illustrates the potential for increasing canopy in each municipality without "unbuilding" current structures.

New Milford, Greenwich, Danbury, Newtown, Stamford, and Norwalk have the largest total acreage that could be planted. Greenwich, Darien, Westport, New Milford, Norwalk, and Bridgewater could see the largest proportional increase in canopy if they were to plant out to their potential.

Table 3: Maximum Canopy Coverage

	Potential Canopy Coverage	Difference
Greenwich	77.3%	27.9%
Darien	74.9%	27.2%
Westport	72.5%	25.4%
New Milford	87.0%	24.3%
Norwalk	62.6%	23.4%
Bridgewater	89.7%	21.6%
Brookfield	80.4%	20.9%
New Canaan	80.3%	19.7%
Danbury	70.5%	18.5%
WestCOG	**79.2%**	**18.0%**
Stamford	68.0%	17.9%
Bethel	81.0%	17.2%
Sherman	86.3%	15.1%
Newtown	84.8%	13.4%
Wilton	82.2%	11.4%
New Fairfield	71.4%	11.4%
Ridgefield	79.5%	11.0%
Redding	88.4%	10.0%
Weston	81.0%	6.3%