

OVERVIEW

Maintaining a healthy urban forest provides a variety of long-term benefits to St. Petersburg including environmental enhancements, economic savings, climate resilience, neighborhood character, wildlife habitat, and much more. The economic value that trees bring to climate mitigation is real and calculable .

As part of enhancing the many tree-related services that the city provides, the Office of Sustainability & Resilience (OSR) recently began coordinating with various city departments to improve collaboration and develop a city-wide approach to urban forestry. Working with those departments, OSR has completed an initial Tree Canopy Analysis for 2017. A city-wide tree canopy analysis will help provide the larger picture, set tree canopy goals, and help to track gains and losses. This information can be used as part of the overall urban forestry program and inform decision-making and investments. In addition to current educational programs organized by Parks & Recreation and Water Resources, OSR is developing a fun citizen science program that will educate and can be used as part of data gathering for ongoing canopy analyses.

The following pages summarize sections from the Tree Canopy Analysis Technical Report, including goals and benefits of a healthy urban forest.



- Urban trees provide:
- Air Quality Improvements
 - Carbon Sequestration
 - Carbon Storage
 - Cultural Significance
 - Energy Savings
 - Habitat for Wildlife
 - Increased Property Values
 - Reduced Stress Levels
 - Shade and Cooling
 - Stormwater Management

CURRENT ST. PETE GOALS RELATED TO TREES

With more than 80% of the US population living in cities, urban trees provide significant, positive, and lasting contributions to human health and quality of life. Unfortunately, urban and community tree cover is declining nationwide at a rate of about 175,000 acres per year, or about 36 million trees per year (Nowak 2018).

While 40% was at one time identified as a goal for tree canopy cover in urban areas, this is no longer the case. Each city should have unique tree canopy cover goals to accommodate their density, climate, history, and variety of land uses (Leahy 2017). Today, many cities strive simply for “gain” or “no net loss.” OSR recommends that St. Pete adopt a 30% tree canopy goal.

The City’s current plans include several goals related to trees. Analyzing and improving urban forestry management will incorporate those goals as well as work with the community to set additional canopy related goals. A few examples of current relevant goals are highlighted below.

Integrated Sustainability Action Plan

Determine city’s current **green infrastructure acreage** and set goal for percentage of land area designated green stormwater infrastructure.

Demonstrate that **85% of population lives within 1/3 mile of green infrastructure** features that provide localized cooling through tree canopy or vegetative surfaces.

Comprehensive Plan

Objective C4

The City of St. Petersburg shall **protect green open space areas and the native vegetation and wildlife** in St. Petersburg in the manner identified in the Recreation/Open Space Element of the Comprehensive Plan so as to maintain a citywide total of **50% green permeable open space**.

Policy C4.1

The City shall **preserve and increase vegetation** (trees, shrubs, herbaceous plants) through enforcement of the existing Land Development Regulations and promote **further restoration of native vegetation** to produce oxygen and filter air pollutants.

Objective C8

The City shall implement the **Urban Forestry Plan** and other existing programs to replant a specified number of new trees in rights of way and other public property, and in an **annual amount to equal or exceed the hardwood trees removed per year** from rights of way areas, through implementation of the Environmental Enhancement Fund.

ST. PETERSBURG TREE CANOPY ANALYSIS: EXECUTIVE SUMMARY

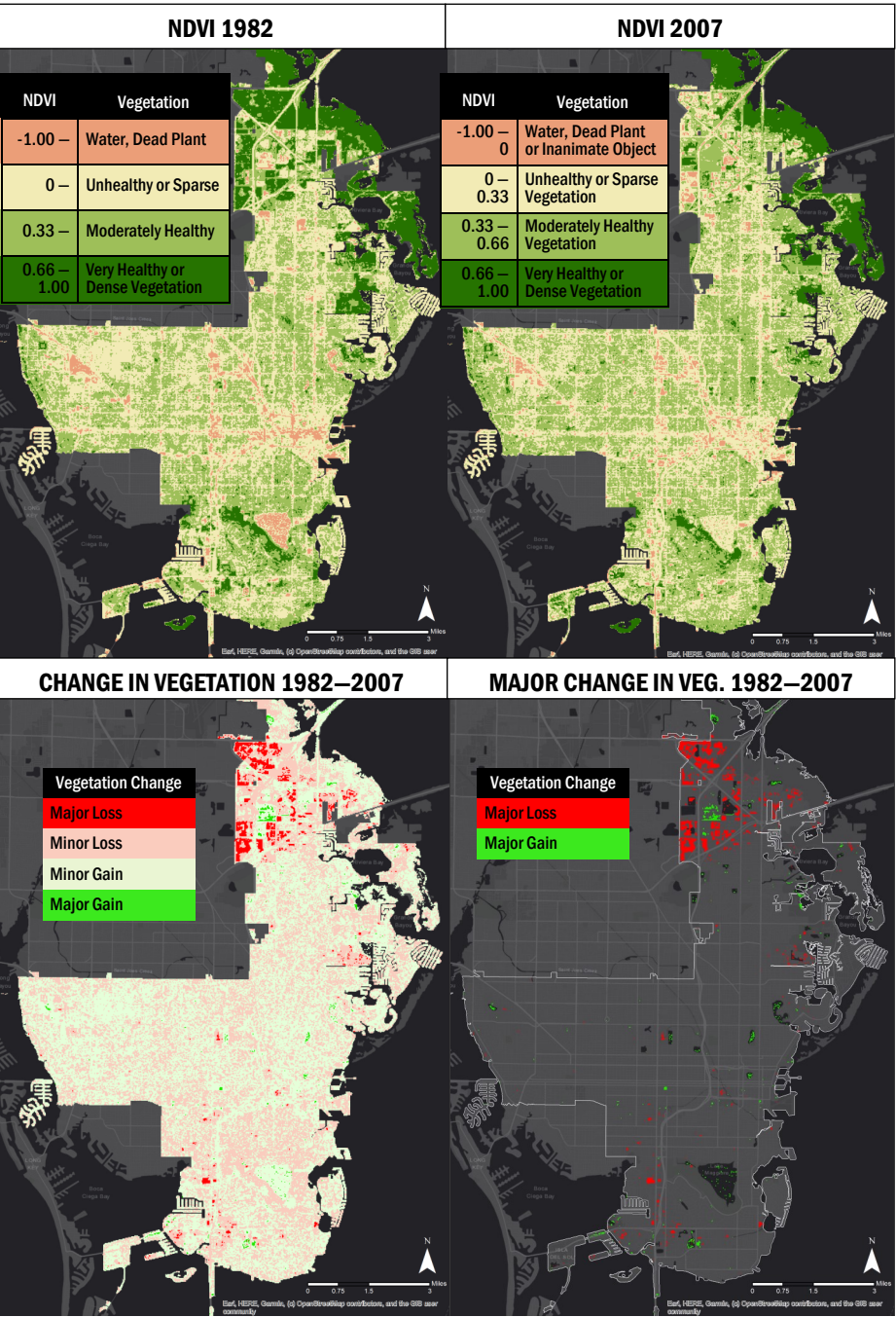
DRAFT CANOPY ANALYSIS RESULTS TO DATE

The following sections summarize the results of a 25-year historical vegetation analysis of St. Petersburg, a 2017 city-wide tree canopy analysis, and a recent statewide analysis conducted by the University of Florida.

Historical Vegetation Analysis: 1982–2007

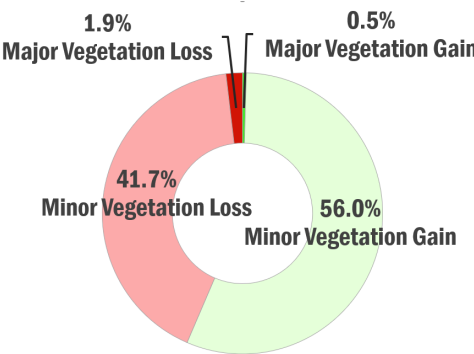
Satellite images of St. Petersburg from 1982 and 2007 were used to illustrate changes in vegetation over a 25-year span. Over this time, 1.9% of the city's land area experienced major loss of vegetation and 0.5% experienced major gain in vegetation. Most of the major change was concentrated at the north end of the city, which today is called the Gateway Activity Center.

The method used in the top two images, Normalized Difference Vegetation Index (NDVI), does not specifically measure tree canopy, but rather all plant life containing biomass or nitrogen (N) content. NDVI values range from -1 (water, dead plants, or inanimate objects) to 1 (very healthy and dense plant life). Mangroves are extremely dense ecosystems, and therefore register very high on the NDVI scale.



It is important to note that this NDVI study compares one day in 1982 to one day in 2007. Annual rainfall levels, temperatures, and many other variables contribute to an image's vegetation index, so this method is most effective for understanding differences in large tracts of vegetation and development over time rather than granular differences.

The method used in the bottom two images is called D-NDVI, which calculates the difference between two NDVI images to illustrate change in vegetation over time. This reveals a scale of vegetation loss to gain.



In total, the area of vegetation gain outweighs the area of vegetation loss, however the area of major loss outweighs the area of major gain. It is helpful to view the areas of major loss and major gain in vegetation to highlight the most dramatic changes in the landscape.

ST. PETERSBURG TREE CANOPY ANALYSIS: EXECUTIVE SUMMARY

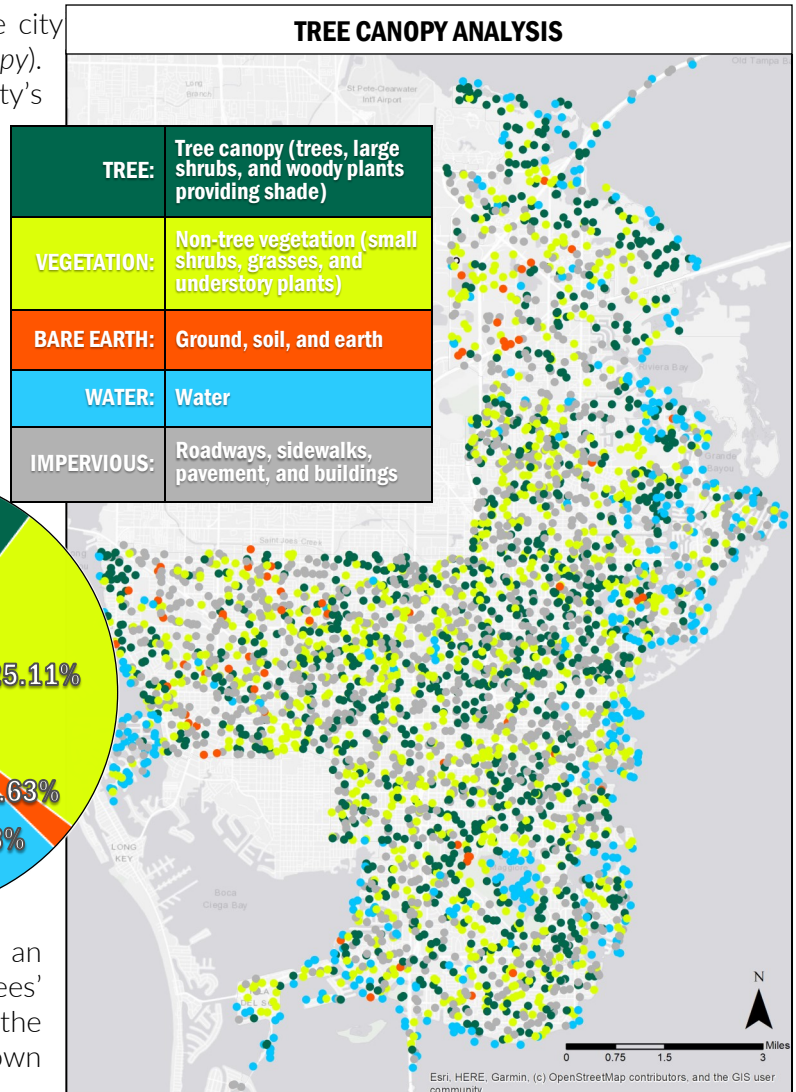
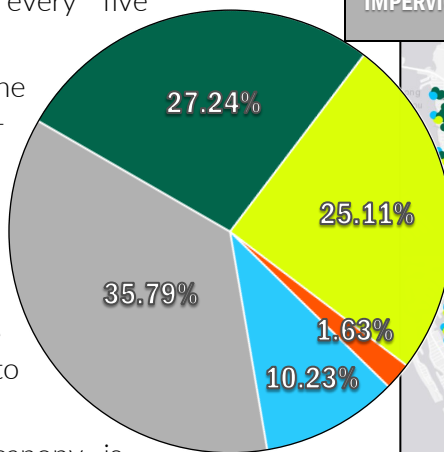
2017 Tree Canopy Analysis

St. Petersburg's tree canopy covers 27.2% of the city (2017 study of 4,000 data points using *i-Tree Canopy*). This is an increase of 3.4% - 4.9% from the City's 1975 analysis that provided a tree canopy cover estimate of 22.1% - 23.56%. Tree and vegetation classes when combined represent 52.4% of the city, and impervious surfaces represent 36.8% in 2017 compared to 45% in 1975.

For a densely populated city that has seen a lot of redevelopment, tree canopy gain is an encouraging result. Moving forward, it is recommended that St. Petersburg's tree canopy is assessed at least every five years.

About i-Tree Canopy: The USDA Forest Service's *i-Tree Canopy* is a web application used to conduct random point sampling. The program randomly selects and presents points for the user to categorize into land cover classes.

St. Petersburg's tree canopy is valued at nearly \$11 million annually, plus an additional \$53 million over the course of the trees' lifetime. These dollar values are based on the ecosystem benefits provided by the trees, as shown in the chart below.



BENEFIT DESCRIPTION	ABBR	VALUE	SE ±	AMOUNT (T)	SE ±
ANNUAL BENEFITS					
Carbon Monoxide removed	CO	\$13,967.76	\$98.34	21,028.86	148.06
Nitrogen Dioxide removed	NO2	\$19,095.88	\$134.45	30.13	0.21
Ozone removed	O3	\$2,241,703.29	\$15,783.37	362.96	2.56
Particulate Matter <2.5 microns removed	PM2.5	\$4,863,110.50	\$34,240.16	14.74	0.10
Sulfur Dioxide removed	SO2	\$1,780.36	\$12.54	16,382.38	115.34
Particulate Matter >2.5 and <10 microns removed	PM10*	\$577,588.66	\$4,066.68	92.45	0.65
Carbon Dioxide sequestered annually in trees	CO2seq	\$3,280,409.70	\$23,096.69	93,047.07	655.13
		\$10,997,656.15	\$77,432.23		
LIFETIME BENEFIT					
Carbon Dioxide stored in trees	CO2stor	\$53,108,107.37	\$373,923.22	1,506,383.23	10606.1
TOTAL BENEFITS					
i-Tree		\$64,105,763.52	\$451,355.45		

ST. PETERSBURG TREE CANOPY ANALYSIS: EXECUTIVE SUMMARY

Florida's Urban Forest: A Statewide Analysis

In November 2020, a team from University of Florida published results of a state-wide urban tree canopy study entitled Florida's Urban Forest: A Valuation of Benefits. The study compares Florida's 29 metropolitan and micropolitan census-designated statistical areas (MSAs), totaling 98% of Florida's population (McLean 2020). The chart below compares data for the top five most populated areas in Florida.

Tampa-St. Petersburg-Clearwater is the second most populated MSA in Florida, with a tree canopy cover result of 46.2%. This regional number is higher than St. Petersburg's estimate of 27.2% because of the many parks and preserves located outside of the city.

This year, in addition to the MSA results, the team from UF will be releasing tree canopy cover results for the 300 most populated cities in Florida. The data and methodology will be available through an online portal. This approach is extremely beneficial for comparing tree canopy of urbanized areas across Florida, and can serve as a supplemental reference point and check on local analysis. It is recommended that St. Petersburg utilize this process moving forward with tree canopy analysis .

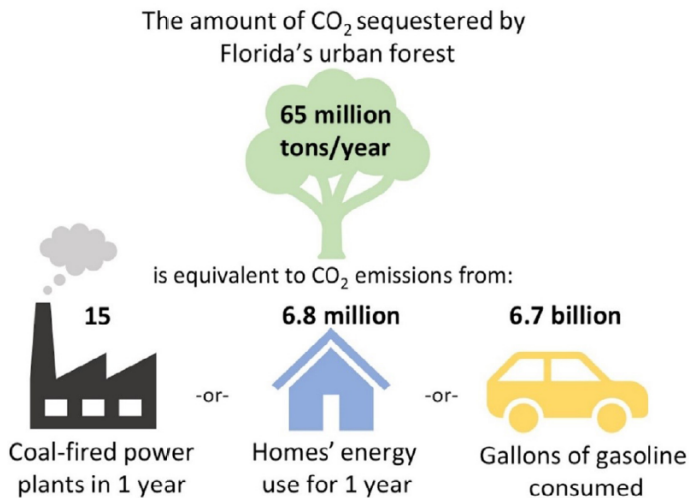
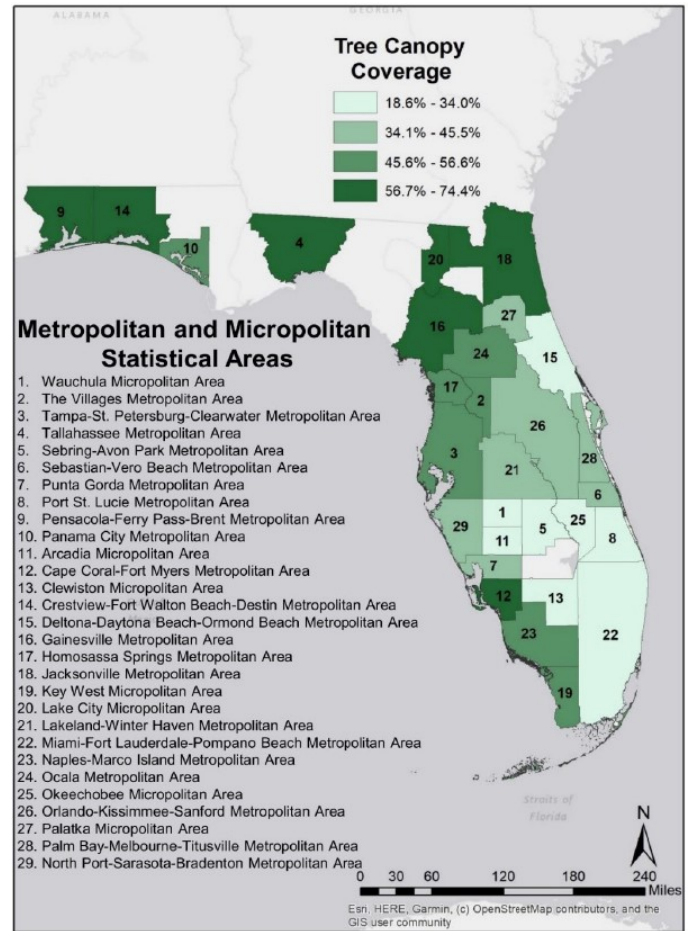


Figure 6. Carbon dioxide emission equivalent infographics.
Credits: US EPA greenhouse gas equivalencies calculator

Area	2019 Population	% Canopy Cover w/95% Confidence	Canopy Area (ac)	Canopy Area SE (ac)
Miami-Fort Lauderdale-Pompano Beach	6,166,488	25.6% ± 1.9%	820,294	31,686
Tampa-St. Petersburg-Clearwater	3,194,831	46.2% ± 2.2%	733,931	18,052
Orlando-Kissimmee-Sanford	2,608,147	45.5% ± 2.2%	1,046,163	26,673
Jacksonville	1,559,514	67.8% ± 2.0%	1,367,161	22,678
North Port-Bradenton-Sarasota	836,995	35.9% ± 2.1%	296,465	8,950

ST. PETERSBURG TREE CANOPY ANALYSIS: EXECUTIVE SUMMARY

NEXT STEPS

- Begin Tree Canopy Assessment to guide tree investments based on available land area, conflicts, equity, funding, and environmental factors.
- Develop a Citizen Science program for public engagement, tree inventorying and tree planting.
- Continue collaboration among departments and work with community to set canopy goals.
- Incorporate goals and recommendations into planning documents and processes such as the City's Comprehensive Plan, Land Development Regulations, Stormwater Master Plan, ISAP progress reports and updates, and other relevant such as StPete2050.



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