

Comparative Ecosystem Benefits of Common Urban Trees and Palms in South Florida¹

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Community trees provide many ecosystem services: improved air quality, reduced heat-island effects, cleaner stormwater runoff, and positive physical and mental health impacts. Additionally, a mature native tree has the lifetime capacity to sequester more than 3000 pounds of carbon dioxide as carbon (i-Tree 2020). Urban forestry Extension programs aimed at redressing canopy loss from urban development and promoting awareness of urban forestry benefits can play a significant role in urban reforestation and, ultimately, climate change mitigation. Ecosystem benefits of urban trees also have an economic impact on communities. In a study of a large midwestern US city, i-Tree data modeling determined that urban tree plantings contributed to saving the city roughly \$6.8M in energy costs and increasing the city's property values by \$7.1M.

In addition to mature size, root structure, and plant hardiness zone, a tree's ecosystem benefits should also be considered when making informed decisions about tree planting choices in urban reforestation. Comparatively, broadleaf trees outperform many conifers and most palms in the ecosystem services they provide—for example, lifetime amount of carbon sequestered in pounds. The quantity of ecosystem benefits a tree provides will depend on the planting site. Planting the right tree in the right place, where spacing considerations and soil conditions can support optimal tree growth while minimizing tree maintenance costs and public safety risks, will result in the tree's capacity to contribute maximum ecosystem benefits. A

comparison of some important ecosystem benefits by tree species is summarized in Table 1. The differences in annual carbon sequestration between species at the same location, with the same diameter at breast height (dbh) and sun exposure, is based on information the i-Tree data model uses to estimate the height of a tree based on species and dbh. The data in the table indicates that based on information in the i-Tree data model, hardwood trees with taller estimated heights annually sequester more carbon.

More information about urban forestry Extension and the benefits of community trees is available at [UF/IFAS Extension Treejuvination Florida](#).

References

- National Urban and Community Forestry Advisory Council (NUCFAC). 2015. *Ten Year Urban Forestry Action Plan: 2016–2026*. https://urbanforestplan.org/wp-content/uploads/2015/11/FinalActionPlan_Complete_11_17_15.pdf
- i-Tree. 2020. "MyTree Benefits Database." <https://mytree.itreetools.org/#/>

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Table 1. Comparative Ecosystem Benefits of Common Urban Trees and Palms in South Florida.

	Broadleaf Trees					Conifers			Palms	
	Gumbo Limbo <i>Bursera simaruba</i>	Mahogany <i>Swietenia mahogany</i>	Live Oak <i>Quercus virginiana</i>	East Palatka Holly <i>Ilex</i> × <i>attenuata</i>	Southern Magnolia <i>Magnolia grandiflora</i>	Slash Pine <i>Pinus elliotii</i>	Bald Cypress <i>Taxodium</i> spp.	Eastern Red Cedar <i>Juniperus virginiana</i>	Florida Thatch Palm <i>Thrinax radiata</i>	Cabbage Palm <i>Sabal palmetto</i>
i-Tree MyTree Benefits¹ (18" dbh)										
Annual CO₂ Sequestered (pounds)	52	623	487	769	423	539	356	57	2	5
Lifetime CO₂ Equivalent of Carbon Sequestered (pounds)	16,325	11,963	10,994	7,321	2,830	4,930	4,872	2,253	75	75
Annual Stormwater Runoff Avoided (gallons)	516	516	505	146	222	271	269	292	50	50
Annual Rainfall Intercepted (gallons)	2,331	2,331	2,283	659	1,003	1,224	1,216	1,318	226	226
Ozone Air Pollution Removed Annually (ounces)	51	44	48	24	32	32	39	44	5	5
Sulfur Dioxide Air Pollution Removed Annually (ounces)	3	2	3	1	2	2	2	2	0.2	0.2

¹ i-Tree is a cooperative effort between the USDA Forest Service, Davey Tree Expert Company, The Arbor Day Foundation, Society of Municipal Arborists, International Society of Arboriculture, Casey Trees, and SUNY College of Environmental Science and Forestry.