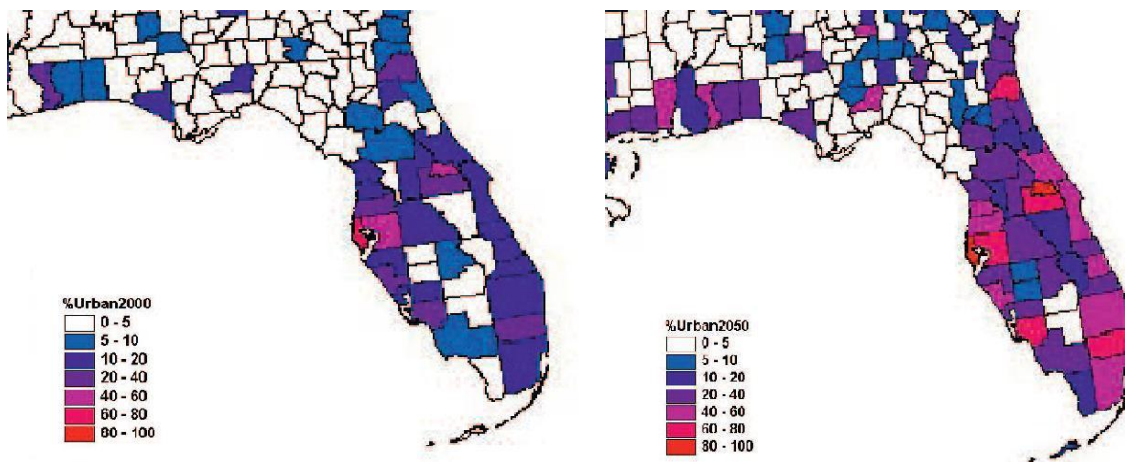


# URBAN AND COMMUNITY FORESTRY



## WHAT IS AN URBAN FOREST?

The community forest is the aggregate of all vegetation and green spaces within communities that provide benefits vital to enriching the quality of life. The trees around our homes, on our streets, in our parking lots, beside our schools, and throughout our parks are part of an urban forest. The urban forest is made up of trees and other vegetation within the built environment. It is highly influenced by people and other factors, such as vehicles, buildings, pavement, utility lines, underground pipes, animals, and other plants. Florida's forests cover 16.2 million acres or 47% of its total land base. These renewable and dynamic resources are undergoing significant pressure from a dramatically increasing Florida population. Since 1987, the forestland base has decreased by 41,500 acres per year, with over 50% of the decrease associated with urban growth. As the area of natural and planted forestland in the state declines, the urban forest increases.



*The county map on the left shows the percentage of urbanization as in the year 2000. The map on the right shows the projected urbanization in 2050. Look at the map and find the county where you live. Is your county projected to become more urbanized? Think about how this change is likely to affect the amount of green space in your county.*

## WHAT IS COMMUNITY FORESTRY?

Simply stated, community forestry is the combination of planning, establishment, management, and research of trees and associated plants (individually, in groups, or under forest conditions) within cities, suburbs, and towns. As cities continue to grow, increasing numbers of people will choose to live, work, and play in community forests,

making the field of community forestry critical for healthy and sustainable living.

Properly cared for and well-managed community forests can provide benefits that far exceed their management costs. Community forests can also bring communities of people together and form connections between humans and the urban flora and fauna.

Additionally, community forests are an integral part of large cities, rural areas, streets, backyards, parks, and open spaces. Community forests provide shade, beauty, and habitat for urban wildlife. Properly planted trees and other vegetation can reduce heating and cooling costs, intercept and store rainwater, improve air quality, and increase property values and local tax bases.

### **URBAN AND COMMUNITY FORESTRY: IMPROVING OUR QUALITY OF LIFE**



Urban and community forestry can make a difference in our lives. Each one of us can make a personal contribution. As we develop and apply technologies for a better way of life, often times side effects adversely affect our natural environment. For example, in our urban areas summer temperatures and noise levels are higher than in the surrounding countryside. Air pollution problems are more concentrated, and the landscape is significantly altered, reducing personal health benefits available to us by having access to wooded areas and green open spaces. Trees help solve these problems. Now, 75 per-cent of us live in cities and towns and we can act individually to improve our natural environment through the planting and care of trees on our own streets, and by supporting community-wide forestry programs. Through technology we are learning more about trees and how they benefit mankind, and how we can do a better job of planting and caring for these trees that make up our urban forests.



## **WHAT DO TREES DO?**

Trees are not only beautiful in themselves but add beauty to their surroundings. Trees add color to the urban scene, soften the harsh lines of buildings, screen unsightly views, provide privacy and a sense of solitude and security, while contributing to the general character and sense of place in communities. Beyond aesthetics and emotional well-being, trees perform important functions that protect and enhance city dwellers' health and property. Trees literally clean the air by absorbing air pollutants and releasing oxygen. They reduce storm water runoff and erosion; they temper climate; they can save energy; they create wildlife habitat; they can improve health, serve as screens, and strengthen community. They can even help contribute to a community's economy and way of life

## **TREES ADD BEAUTY AND IMPROVE PERSONAL HEALTH**

Trees are major capital assets in America's cities and towns. Just as streets, sidewalks, sewers, public buildings and recreational facilities are a part of a community's infrastructure, so are publicly owned trees. Trees-and, collectively, the urban forest-are important assets that require care and maintenance the same as other public property. Trees are on the job 24 hours every day working for all of us to improve our environment and quality of life.

Without trees, the city is a sterile landscape of concrete, brick, steel and asphalt. Picture your town without trees. Would it be a place where you would like to live?



*Which one of these photographs is the least attractive? Why?*

Trees make communities livable for people. Trees add beauty and create an environment beneficial to our mental health. Trees:

- Add natural character to our cities and towns.

- Provide us with colors, flowers, and beautiful shapes, forms and textures.
- Screen harsh scenery.
- Soften and compliment the outline of masonry, metal and glass.

The benefits of cleaner air and water are obvious. But trees also impact deeply on our moods and emotions, providing psychological benefits impossible to measure. A healthy forest growing in places where people live and work is an essential element of the health of the people themselves. Trees:

- Create feelings of relaxation and well-being.
- Provide privacy and a sense of solitude and security.
- Shorten post-operative hospital stays when patients are placed in rooms with a view of trees and open spaces.

A well-managed urban forest contributes to a sense of community pride and ownership.

### **TREES IMPROVE AIR QUALITY**

The health and well-being of our environment are affected by the air that surrounds us. Air pollution such as dust, ash, pollen, smoke and exhaust fumes is the bane of most cities and many towns. At its worst, it can be seen and smelled and even felt. Since the emission of many air pollutants increases with higher temperatures, trees can improve air quality by lowering air temperatures. Trees further their cleansing work by absorbing gaseous pollutants into their leaves and trapping and filtering particulates on and through their leaves, stems, and twigs. Trees have the potential to impact pollutants emitted from power plants by shading buildings and lowering air temperatures in the summer and blocking winds in the winter, which reduces the use of energy for air conditioning and heating. If trees shade a parking lot, they can also reduce pollutants emitted from vehicles.

### **QUICK FACTS:**

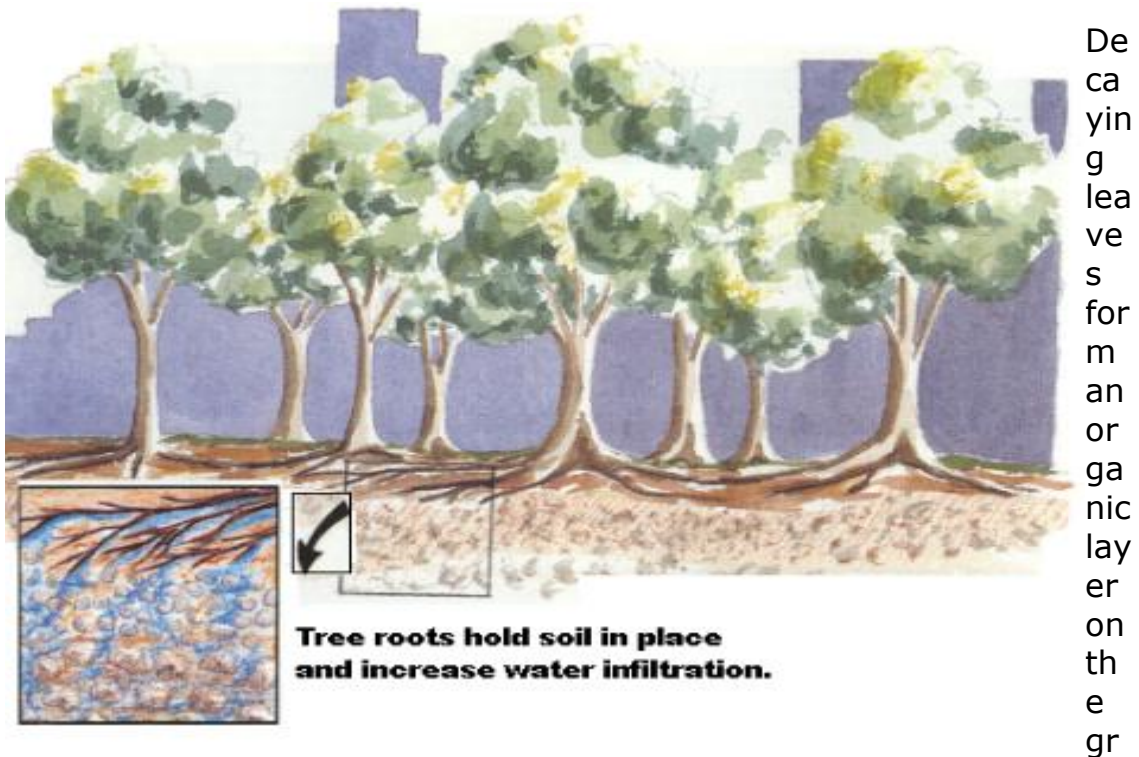
- Produce enough oxygen on each acre for 18 people every day.
- Absorb enough CO<sub>2</sub>, on each acre, over a years time, to equal the amount you produce when you drive your car 26,000 miles.

As ground is cleared for development, the loss of trees in our urban areas not only intensifies the urban "heat-island" effect from loss of

shade and evaporation, but we lose a principal absorber of carbon dioxide and trapper of other air pollutants as well.

### TREES REDUCE STORM WATER RUNOFF

As towns and cities grow bigger, the amount of impermeable surfaces such as asphalt, paving and roof tiles increases. Water runs off these surfaces very quickly. This results in large volumes of water entering drainage systems very quickly. A lot of money and infrastructure is needed to ensure water can drain away from our streets. Trees can help! Trees influence the flow of water in several ways. Their leafy canopy catches precipitation before it reaches the ground, allowing some of it to gently drip and the rest to evaporate. This interception lessens the force of storms and reduces runoff and erosion. Research indicates that 100 mature trees intercept about 100,000 gallons of rainfall per year in their crowns, reducing runoff and providing cleaner water. Tree roots also hold soil in place and reduce soil erosion caused by wind



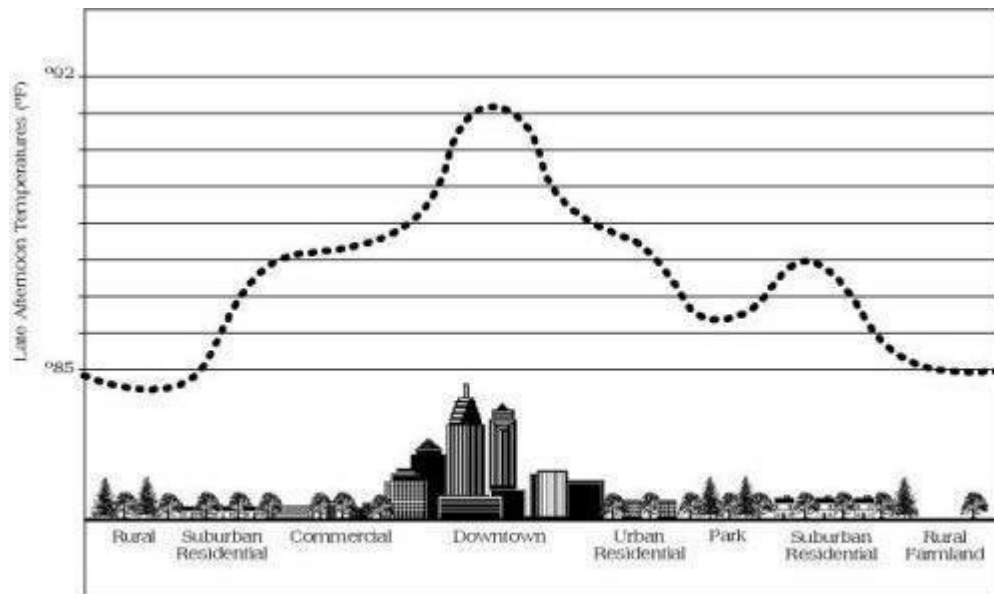
ground that allows water to percolate into the soil, which also reduces runoff and soil erosion. All of this helps reduce flooding in the streets and sedimentation in streams.

A 1996 study by the American Forests found that Fort Lauderdale's urban forest reduced the volume of storm water by as much as 18%.

If some of that water were filtered through the urban forest it could recharge underground aquifers. Thus, towns and cities that remove their trees and fill in their open space will need to construct and maintain a larger storm water drainage system to handle the increased runoff. Maintaining or increasing the urban forest can help communities be more cost effective by conserving water, reducing erosion and flooding, and decreasing chemical pollution which improves quality of water.

### TREES MODIFY THE URBAN CLIMATE

Trees modify local climate, chiefly by lowering air temperature and increasing humidity; they can also influence wind speed and reduce glare. Inner cities are commonly known as "heat islands" because the buildings and pavement absorb solar energy and radiate it back. Trees lining streets or near buildings provide shade that can reduce the heat-island effect, lessening the amount of air conditioning needed. Evaporation of water from trees through the transpiration process also has a cooling effect, especially in hot climates or seasons.

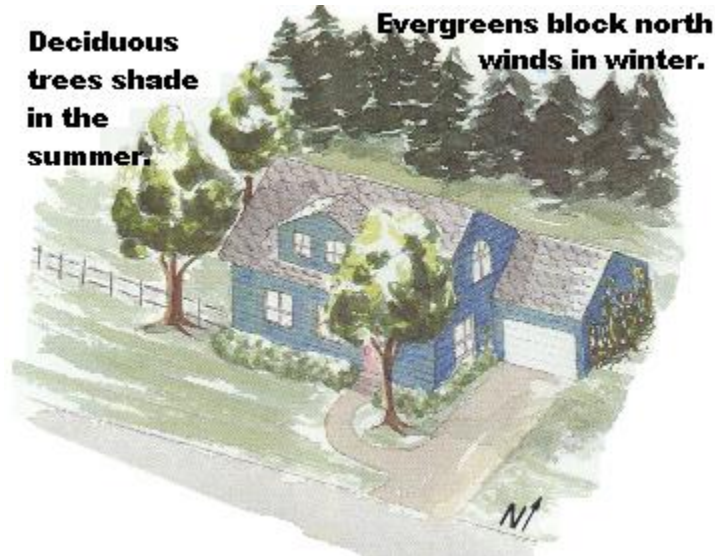


*The diagram above demonstrates the "Heat Island " effect. Inner cities retain heat which is radiated back into the surrounding air. This results in a localized increase in air temperature.*

A 1996 study sponsored by the American Forests found that over 90 percent of the homes in Dade County, Florida, have air conditioners. In fact, half of all residential energy use was dedicated to powering them. This study estimates that one mature tree in the right location near

each home could save Dade County residents over \$14.4 million a year in reduced energy bills.

## TREES SAVE ENERGY



Strategically placed trees can be as effective as other energy saving home improvements, such as insulation and the installation of weather-tight windows and doors. Trees can help reduce your heating and cooling costs.

Trees save energy through cooling in the hotter months. They provide a windbreak during winter. This results in burning less fossil fuels to generate electricity for cooling and heating.

Three large trees planted correctly around your home can reduce air conditioning costs up to 30 percent. Shade trees offer their best benefits when you:

- Plant deciduous trees, which shed their leaves during winter. These trees provide shade and block heat from the sun during hotter months. By dropping their leaves in the fall they admit sun-light in the colder months.
- Place these trees on the south and west sides of buildings.
- Shade all hard surfaces such as driveways, patios and sidewalks to minimize landscape heat load.

Use evergreens, which retain their leaves/needles year-long, in a planned pattern. They will serve as windbreaks to save from 10 to 50 percent in energy used for heating. Evergreens offer their best benefits when you:

- Place them to intercept and slow winter winds, usually on the north side of your home.



- Do not plant them on the south or west sides of your home, because they block warming sun-light during winter. These trees also provide some shading benefits during summer..

Trees can offer their best shade and air quality benefits in cities by:

- Increasing the number of healthy trees to maximize canopy cover;
- Planting trees in energy conserving locations to reduce cooling and heating cost, thereby decreasing emissions from power plants;
- Planting trees in polluted or in heavily populated areas;
- Choosing trees that have needles or leaves throughout the year, which can potentially remove particulate matter year round.

One of the best ways to affect air pollution is to sustain large healthy trees!

These energy savings, spread over many houses and many neighborhoods, can reduce the demand for power production by utility plants, which in turn reduce the air pollutants produced by these plants.

**Click on the link below and do these things:**

<http://www.arboday.org/trees/benefits.cfm>

a) Click on the trees in the picture to investigate the how trees planted around your house can benefit you and your family.

b) Read about the valuable ways that trees benefit the community.

Q: Landscaping can reduce air conditioning costs by up to how much?

A:\_\_\_\_\_

Q: One acre of forest absorbs how many tons of carbon dioxide?

A:\_\_\_\_\_

Q: One acre of forest puts out how many tons of oxygen?

A:\_\_\_\_\_

## Activity

In the following exercise you will investigate the urban benefits that two imaginary trees growing in your yard would give. You will examine the differences between the two trees. We will select a Live oak and a Cabbage palm as our two imaginary trees.

**STEP 1** [Click here](#) to visit the National Tree Benefits calculator.

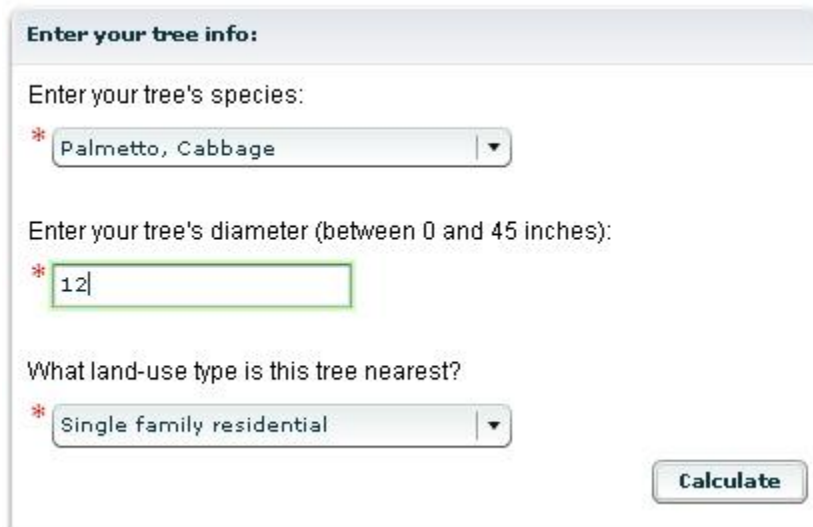
Or go to: <http://www.treebenefits.com/calculator>

**STEP 2** Insert the zip code of where you live in the box on the right hand side. This will determine which climate zone you live in.

**STEP 3** Select "Palmetto, cabbage" from the drop-down box. (Another name for this tree is the Sabal Palm, the State tree of Florida.)

**STEP 4** Enter its diameter as 12".

**STEP 5** Enter "Single family residential" as the land-use type. The input box should look like the example below:

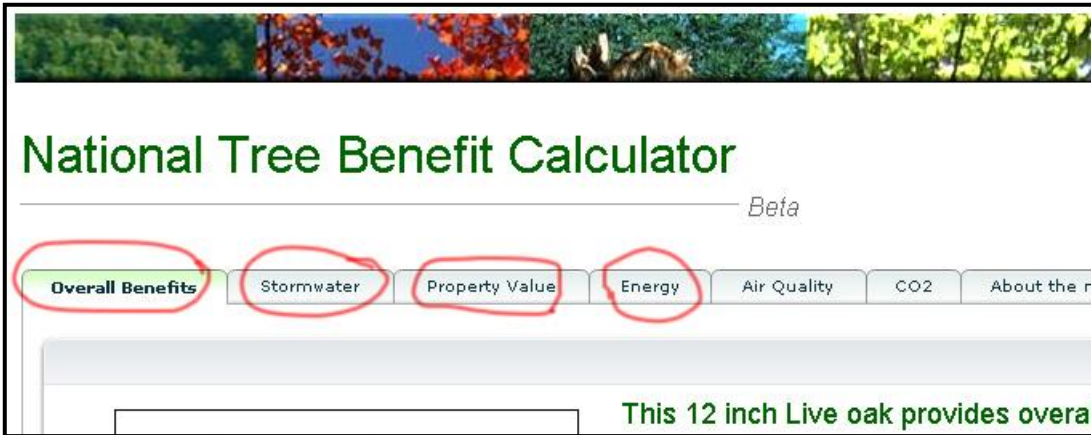


The screenshot shows a web form titled "Enter your tree info:". It contains three input fields, each with a red asterisk indicating a required field. The first field is a dropdown menu labeled "Enter your tree's species:" with "Palmetto, Cabbage" selected. The second field is a text box labeled "Enter your tree's diameter (between 0 and 45 inches):" with the number "12" entered. The third field is a dropdown menu labeled "What land-use type is this tree nearest?" with "Single family residential" selected. A "Calculate" button is located at the bottom right of the form.



**STEP 6** Click on the "Calculate" button. The computer program uses information about the climate where you live and properties of the tree to calculate the benefits given by that tree.

**STEP 7** On the website, click on the tabs in the results table for the categories listed in the table below. Write your results in the Results comparison table on the next page.



**STEP 8** Repeat the exercise, but chose a **Live oak** with 12" diameter and "Single family residential"

Results comparison table

Tree benefits	Cabbage palm	Live oak
Overall benefits		
Storm water benefits		
Property value		
Energy savings		

**STEP 9** Look at the differences in benefits between the Live oak and the Cabbage palm. Can you explain the differences?

**Trees improve the economy**

Community trees provide subtle but real economic benefits. The value of houses on lots with trees is usually higher than those of comparable houses on lots without trees. Healthy mature trees can add up to 15% to a property value. Studies have shown that shoppers linger longer along a shaded avenue than on one barren of trees. Shaded thoroughfares are not only more physically comfortable but also psychologically more attractive. And an abundance of trees "says something" about a community that makes it more appealing to newcomers as well as residents. In addition to enhancing the home and business environment in an urban area, recreation areas such as parks, greenways, and river corridors that are well stocked with trees tend to keep recreation seekers "at home" rather than driving many miles to find suitable places to play. Here again, less fuel is used and less pollution created. It would be difficult to put a dollar value on such urban playgrounds, but if each visit were valued at only one dollar, the total for the typical city would be in the thousands of dollars per year.

The scope and condition of a community's trees and, collectively, its urban forest, is usually the first impression a community projects to its visitors. Studies have shown that:

- Apartments and offices in wooded areas rent more quickly and have higher occupancy rates and tenants stay longer.
- Businesses leasing office space in wooded developments find their workers are more productive and absenteeism is reduced.
- Streets with little or no shade need to be repaved twice as often as those with tree cover. This means that shade trees save cities money and help make a community look better maintained for longer.

### **TREES CREATE WILDLIFE HABITAT**



Wherever trees are established, wildlife and other plants are sure to follow. Trees and associated plants provide shelter and food for a variety of birds and animals. The presence of trees creates an environment that allows the growth of plants that otherwise would not be

there, enhancing the diversity. Again, the monetary value of such diversity is incalculable, but it is well known that residents of and visitors to a community appreciate and enjoy it. Simply put, the presence of trees creates an environment that is much more pleasant for living, working, and playing.

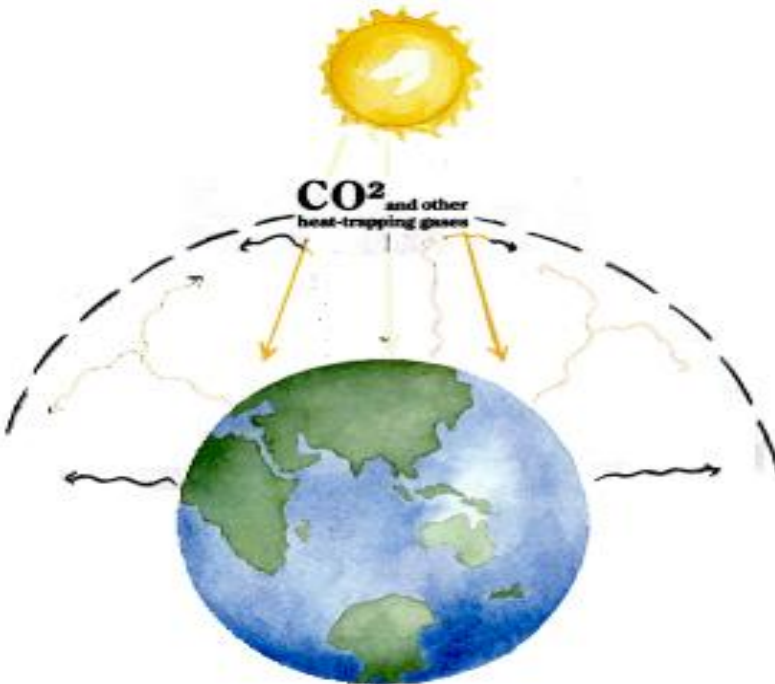
### **TREES PROVIDE RECREATIONAL OPPORTUNITIES**

Many city residents appreciate the recreational benefits urban forests provide. With the growing emphasis on physical fitness, urban forests, parks, and open spaces have become increasingly popular as places to walk, run, bike, and hike. Urban parks are often sites for large community events, such as art and music festivals. Parks are also used for just relaxing and watching the world go by.

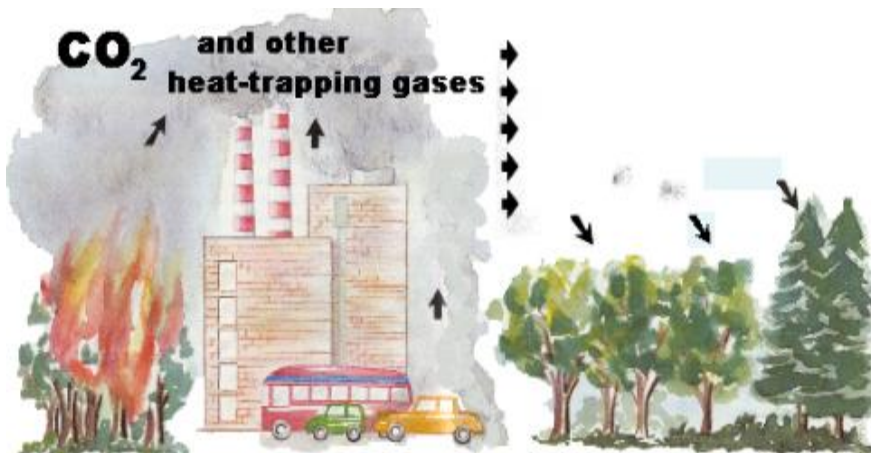




### TREES FIGHT AGAINST THE GREENHOUSE EFFECT



Heat from Earth is trapped in the atmosphere due to high levels of CO<sub>2</sub> and other heat-trapping gases which prohibit it from releasing heat into space-creating a phenomenon known as the "greenhouse effect".



The burning of fossil fuels for energy and large scale forest fires such as in the tropics are major contributors to the buildup of CO<sub>2</sub> in the atmosphere. Managing and

protecting forests and planting new trees reduces CO2 levels by storing carbon in their roots and trunk and releasing oxygen into the atmosphere

Trees act as a carbon sink by removing the carbon from CO2 and storing it as cellulose in the trunk while releasing the oxygen back into the air. A healthy tree stores about 13 pounds of carbon annually - or 2.6 tons per acre each year.

Trees also reduce the green-house effect by shading our homes and office buildings. This reduces air conditioning needs up to 30 percent, thereby reducing the amount of fossil fuels burned to produce electricity.

This combination of CO2 removal from the atmosphere, carbon storage in wood, and the cooling effect makes trees a very efficient tool in fighting the greenhouse effect.

### **TREES SERVE AS SCREENS**

Densely planted rows of trees around homes and buildings and along streets and roads can serve as screens to preserve privacy and shut out unwanted or unsightly views. Wide belts of such plantings can also help to muffle sound. With proper design, tree plantings can also re-direct attention away from unsightly areas.

### **TREES REDUCE NOISE LEVELS**

Trees and vegetation can form a barrier that partially deadens the sound from traffic, lawn mowers, and loud neighbors. To be effective, the landscaping should be dense, tall, and wide, and planted close to the source of the noise. Trees also create "background" noise of rustling leaves and wind through the branches that can help muffle other noises.

### **TREES PROMOTE COMMUNITY**

A stronger sense of community, an empowerment of inner-city residents to improve neighborhood conditions, and the promotion of environmental responsibility and ethics can be attributed to involvement in urban forestry efforts. Active involvement in tree planting programs enhances a community's sense of social identity, self-esteem, and ownership; it teaches residents that they can work together to choose and control the condition of their environment.

Planting programs also project a visible sign of change and provide the impetus for other community renewal and action programs. Several studies show that participation in tree-planting programs influences individuals' perceptions of their community. Conversely, a loss of trees within a community can have significant psychological effect on residents.

## **URBAN TREE CARE AND MAINTENANCE**

Cities and towns make harsh environments for trees, so we must give them special care and protection. Establishing and maintaining community trees and forests can be challenging and costly, but the benefits described here are well worth the time, trouble, and money spent. Trees in urban settings often need to be protected, planted (or transplanted), and tended. This is both an individual and community responsibility.

Right tree right place:

[http://www.treesaregood.org/treecare/tree\\_selection.aspx](http://www.treesaregood.org/treecare/tree_selection.aspx)

<http://www.arboday.org/trees/righttreeandplace/quiz.cfm>



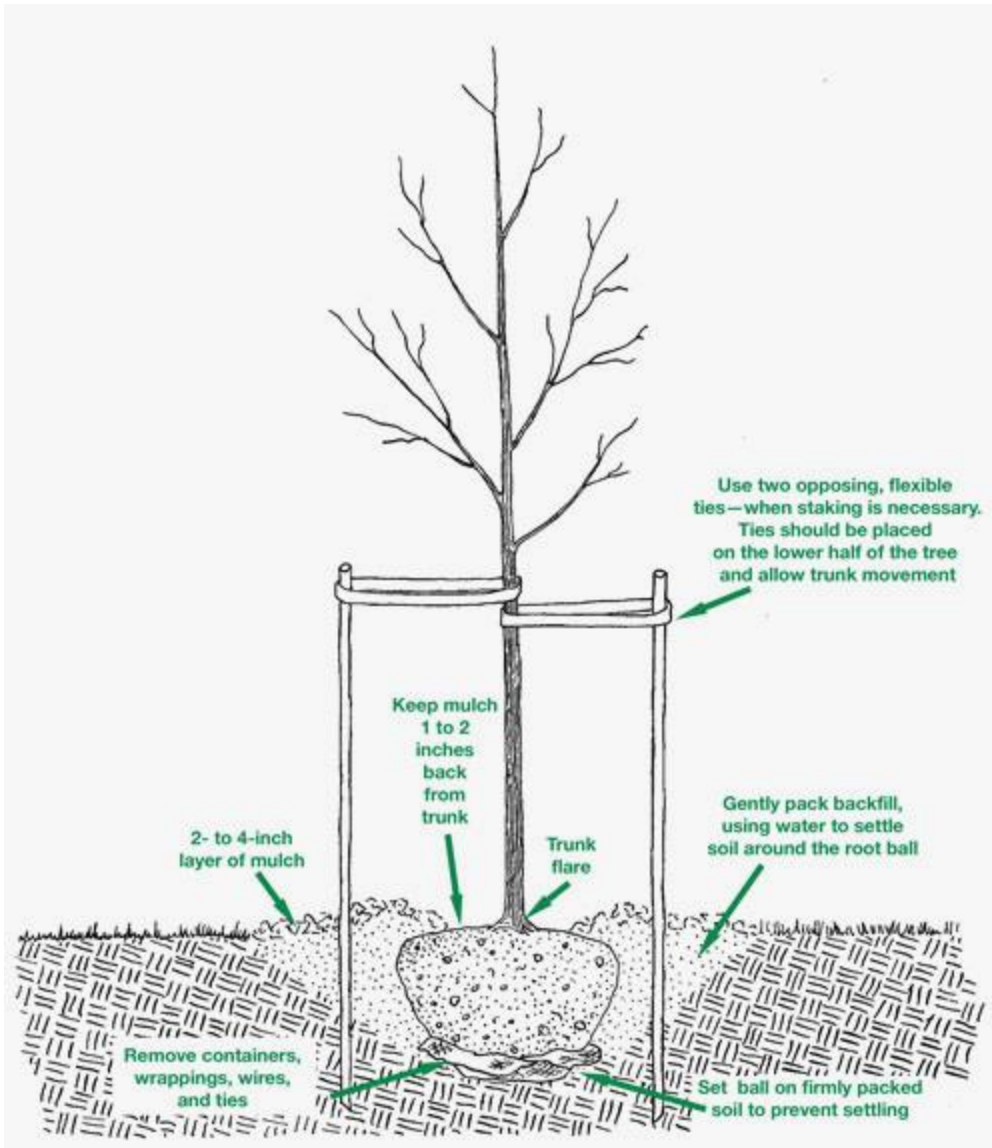
*This tree wasn't given enough room to grow.*

Take the online quiz. Don't worry if you get wrong answers. You are not expected to know all the trees mentioned in this quiz.

<http://www.arboday.org/trees/righttreeandplace/quiz.cfm>

The best ways to plant a new tree:

[http://www.treesaregood.org/treecare/tree\\_planting.aspx](http://www.treesaregood.org/treecare/tree_planting.aspx)



Mulching:

<http://www.treesaregood.org/treecare/mulching.aspx>



## **HOW CAN WE MAXIMIZE URBAN FOREST BENEFITS IN FLORIDA?**

Urban trees and other vegetation make a daily difference to the quality of life for the 80 percent of the U.S. population who live in urban areas. Despite these benefits, the urban forest also poses risks to residents and property. When exposed to hurricanes and tropical storms, urban trees can lose branches and topple over, bringing down power lines, tearing up water mains, and damaging anything in the way. We can design and maintain urban forests to better withstand high winds, however.

Planting species that have greater wind resistance, pruning them with care, and removing trees with poor wind resistance can help improve the urban forest's capacity in a storm. Planting trees in the best location and providing appropriate water and nutrients are also important.

Wind resistance is a function of tree characteristics such as form, size, trunk, branches and root system, wood density, leaf size, and a few environmental characteristics like depth to water table and surrounding structures. The faster the winds blow, the greater the chance a tree will break or fall. Trees like live oak, magnolia, and cabbage palm tend to do better than red maple, water oak, and queen palm for example, though no tree is absolutely wind proof.

Proper planting plays an important role in maintaining a healthy urban forest. For instance, a tree planted next to a building is left without adequate space for the roots to grow in one direction and is prone to blowing over. The installation of sidewalks or roads may cut roots on one side of a tree, increasing the chance it will topple.

Pruning is also very important to wind resistance. Trees that have been pruned on a regular basis have stronger and fewer branches and are less likely to fall than unpruned trees. Understanding the importance of these characteristics can assist urban dwellers in minimizing property damage and injury from trees falling over during storms.

Thanks to Florida's subtropical climate, our urban forest hosts a rich diversity of trees. While longleaf pine and live oaks are common trees in north Florida's urban areas, palms, cycads, jacarandas, and sea grape are more common in the south. Florida's urban forests can include slash and longleaf pine trees growing on the outskirts of Tallahassee, crape myrtles lining boulevards in Lakeland, live oaks and

Sabal palms in Tampa, or orange and papaya trees growing in Miami backyards.

Florida has seen tremendous changes in a short period of time due to our rapid population growth. Young people can play an important role in helping Florida's urban forests support environmental, social and economic goals in their towns and cities.

**Tree quotes**

Get inspired! Read some of the tree quotes by famous people.

<http://www.treelink.org/linx/Quotesearch.php>

Read the factoids about the benefits of trees in the urban environment.

<http://www.treelink.org/linx/factoid.php>

Now that you have studied how urban trees bring so many benefits to communities, look at the two photographs below and the descriptors that go with them.

Can you think of any other words that describe the communities in the photographs below? Write them down next to the pictures.

**Hotter** \_\_\_\_\_  
**More Glare** \_\_\_\_\_  
**More Noise** \_\_\_\_\_  
**More Water Runoff** \_\_\_\_\_  
**More Energy Used** \_\_\_\_\_  
**Harsh Landscape** \_\_\_\_\_



**Cooler** \_\_\_\_\_  
**Less Glare** \_\_\_\_\_  
**Absorbs Noise** \_\_\_\_\_  
**Less Runoff** \_\_\_\_\_  
**Less Energy** \_\_\_\_\_  
**More Beautiful** \_\_\_\_\_



Where would you rather live?

## COMMUNITY RECOGNITION FOR URBAN FORESTRY

### TREE CITY USA

A community's urban forest is an extension of its pride and community spirit. TC USA is a state program that recognizes community effort to manage and care for its urban trees. Click on the link to learn about the Tree City Program.

[http://www.fl-dof.com/forest\\_management/cfa\\_urban\\_tree\\_city.html](http://www.fl-dof.com/forest_management/cfa_urban_tree_city.html)



What four things does a community have to have in place before it can be awarded **Tree City** status?

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_
- 4 \_\_\_\_\_

### ARBOR DAY



PHOTO: Smokey Bear helps with planting a tree on Arbor Day.

Arbor Day is a nationally-celebrated observance that promotes the benefits of trees in the urban environment and encourages tree planting and care. Founded by J. Sterling Morton in Nebraska in 1872, National Arbor Day is celebrated each year on the last Friday in April.

Individual states conduct their own Arbor Day celebrations at various times of the year. Florida has one of the first Arbor Day celebrations in the nation, on the third Friday in January. In 2011, Arbor Day will be celebrated January 21<sup>st</sup>. Over 100 communities in Florida celebrate Arbor Day, either as a stand-alone event or in conjunction with some other occasion. National Arbor day is on

April 22<sup>nd</sup> 2011.

Click here to learn about how you can celebrate Arbor Day.

<http://www.arborday.org/arborday/celebrate.cfm>

Click here to learn about the history of Arbor Day

<http://www.arborday.org/arborday/history.cfm>

## **CHAMPION TREES OF FLORIDA**

The Champion Tree Program was created by the American Forests organization in 1940, to recognize the largest known tree of each species in the United States. American Forests publishes their "National Register of Big Trees" every two years. The new 2010 edition of the Register includes 99 Florida species, many of which are only found in the tropical region of the state. Florida now has the most national champions of any state. The largest National Champion tree in Florida is a native Florida Strangler Fig located in Dade County. This tree measures 360 inches in circumference, stands 63 feet tall, and carries a crown spread of 72 feet.

Florida began keeping a state register, the Florida Champion Tree Register, in 1975 to recognize the largest tree of each species within this state. It now contains hundreds of tree species, including National champions

The Florida Champion Baldcypress is in Big Tree Park, Seminole County. It is named The Senator, although not a national champion, it is the largest native tree in Florida, measuring 425 inches in circumference, 118 feet in height, with a 57 foot crown spread.

The tree used to be 165ft, but in 1925 a hurricane knocked its top off!

A lightning rod has since been installed to protect the tree from further damage.

