Texas A&M Forest Service

Benefits of Trees: **Environmental**

Trees provide many environmental, economic and social benefits. They add aesthetic appeal, soften the harsh lines of buildings and infrastructure, screen unsightly views, provide privacy and a feeling of solitude, while helping contribute to the character and sense of place in communities.

Beyond aesthetics and emotional well-being, trees provide important functions such as enhancing public health, increasing property values and providing low cost, long lasting environmental benefits. Trees clean the air by absorbing air pollutants and releasing oxygen. They reduce stormwater runoff and erosion, help temper climate and the urban heat island effect, reduce energy consumption, and create wildlife habitat.

Heat Island Reduction:
Inner cities are commonly known as "heat islands" because the buildings and pavement absorb solar energy and radiate it back. Trees lining streets, in parking lots or near buildings provide shade that can reduce the heat-island effect, reducing surrounding temperatures by as much as 7 - 9 degrees and 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. Temperatures directly under trees can be as much as 25 degrees cooler than nearby asphalt pavement.

Energy Conservation:
Residential trees help to conserve energy through shading and evapotranspiration. Three or more large trees strategically placed on the sunny sides of a house can shade it form the hot summer sun, thus reducing air-conditioning usages and costs by as much as 30 percent during the summer. Deciduous trees are usually best for this because they lose their leaves in winter, allowing for sun exposure which helps to reduce the energy needed for heating. Evergreen trees, trees that retain their leaves year-round, can serve as windbreaks when placed in the path of prevailing winter winds, usually the north and northwest sides of a house. The energy savings from properly placed trees, spread over many houses and neighborhoods, can help to reduce demand from power production by utility plants, which in turn reduces air pollutants that are emitted from power plants when generating power.
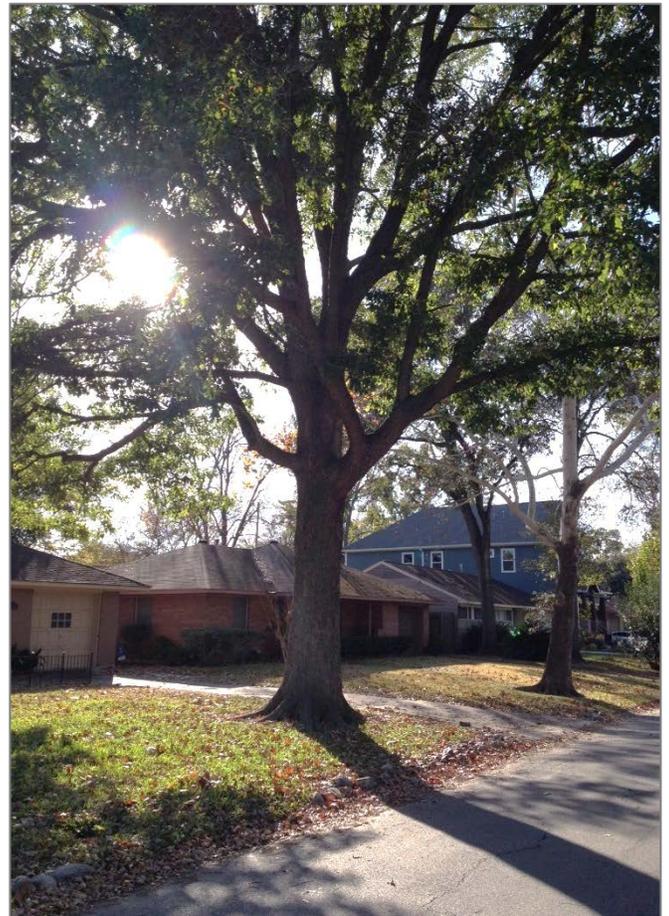
Reducing Stormwater Runoff and Erosion:
Trees influence stormwater runoff in several ways. A tree's canopy buffers precipitation, capturing some and allowing the rest to lightly drip to the ground. This interception lessens the force of rainfall and reduces runoff and erosion. Research indicates that a single large mature tree intercepts about 6,000 gallons of rainfall per year, on average the amount of water a family of four will use in a 30 day period. Tree roots also slow down stormwater runoff flow while helping to hold soil in place. In addition, in wooded areas decaying leaves form an organic layer on the ground allowing water to percolate into the soil, which also helps to reduce runoff and soil erosion. The cumulative effect of this interception reduces runoff and filters pollutants ,which provides cleaner water and reduces flooding in streets and sedimentation in streams.

Improving Air Quality:
Air pollution is a concern of most cities and many towns. At its worst, it can be seen, smelled and cause respiratory problems. Since the emission levels of many air pollutants increase with higher temperatures, trees can improve air quality by lowering air temperatures, as well as absorbing gaseous pollutants into their leaves. In addition, they trap and filter particulates through their leaves, stems and twigs and act as a carbon sink by storing carbon in their wood. Trees can help to reduce pollutants emitted from power plants by shading buildings and homes in the summer and blocking winds in the winter. This reduces the use of energy for air conditioning and heating. In a tree shaded parking lot, they can also reduce pollutants emitted from vehicles and help to reduce the heat island effect by lowering air temperatures.

Wildlife Habitat:
Wherever trees are established, an increase in wildlife numbers and diversity will follow. Trees and associated plants provide shelter and food for a variety of animals including, mammals, birds and insects. While it is difficult to calculate the value of this benefit, it is well known that a healthy animal population usually means a healthier environment for humans.

Houston Urban Heat Islands

Source

Landsat-7 ETM+
Thermal band (6L)
Acquired 09/20/1999

Gulf Coast Institute