

Trees in the Community

Why should communities plant trees?



Summary

The **Volunteer Canopy Program** aims to expand tree canopy by encouraging neighborhoods to plant on private property. It is essential that we work together to create a better future.

This presentation will cover the importance of working with private homeowners, the Urban Heat Island effect, the ecosystem benefits that urban forests provide, and, finally, the additional benefits that humans receive from trees.



Private Property

Explore why planting on private property is essential.

Urban Heat Islands

What is an Urban Heat Island and how do trees help?

Ecosystem Benefits

What are ecosystem services and what kind do trees provide?

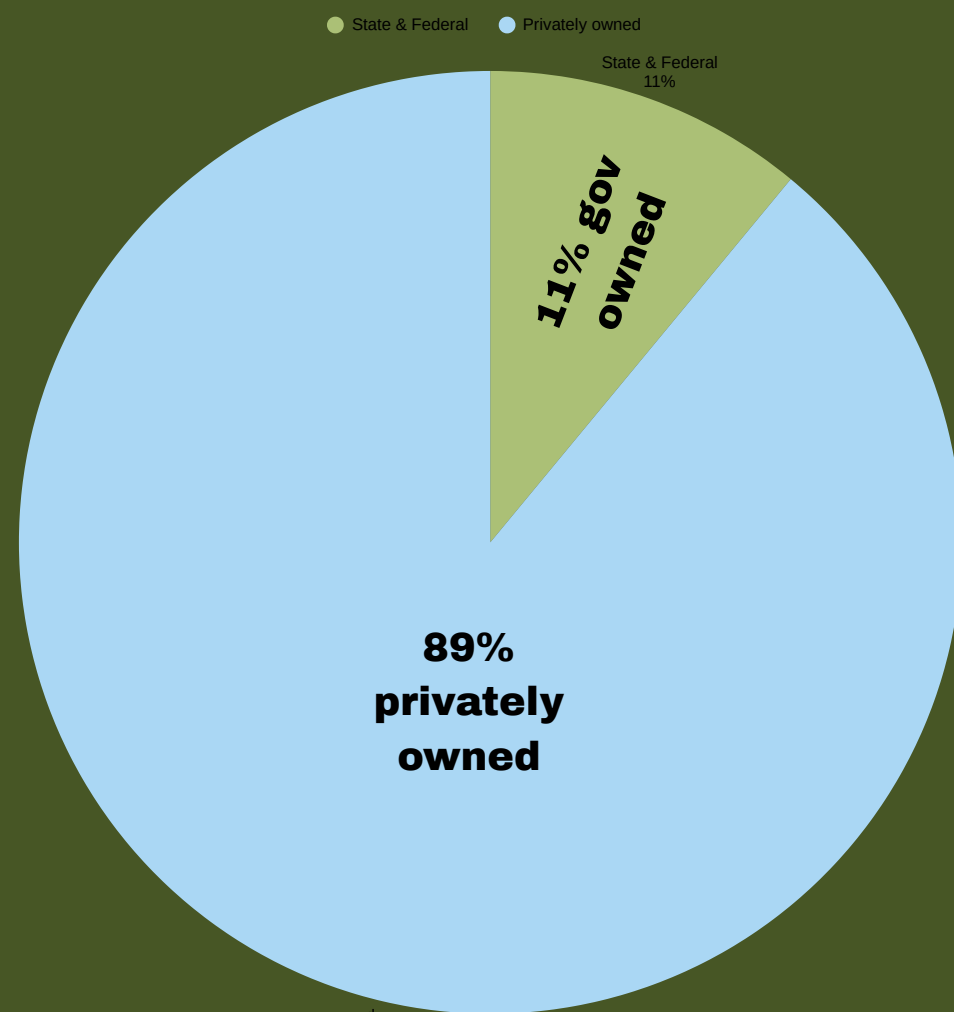
Benefits to Humans

What benefits do trees provide that increase human well-being.

Private Lands

According to the Tennessee Wildlife Federation, about **89% of the land in Tennessee is privately owned**. This is why it is important to work with homeowners and educate them on the importance of having a healthy urban forest.

In addition, originally **about 85% of Tennessee was covered by forests, however, today that number has decreased to about 52%** due to urbanization and agricultural development. It is time we start rebuilding it!



Urban Heat Islands

What is an Urban Heat Island (UHI)?

An **urban heat island** occurs when the temperature within a city is consistently higher than the surrounding rural areas.

In the City of Knoxville, it can reach up to 10-20 degrees F hotter than surrounding areas, during the summer.

Some things that contribute to UHI are concrete, low vegetation, energy use, and green house gas emissions.

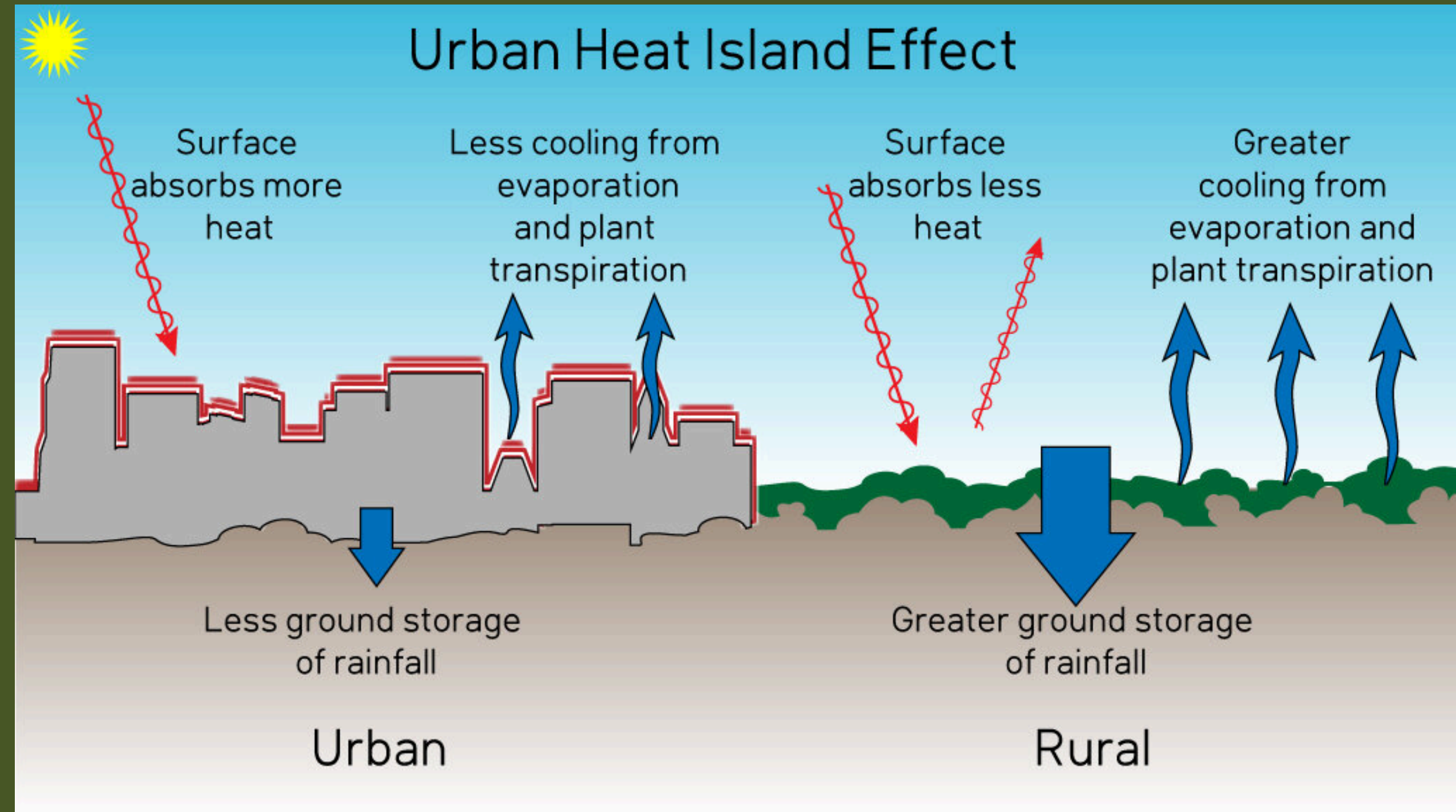


Heat Absorption

Cities retain more heat because they have a lower albedo. **Albedo** is the measure of how much sunlight is reflected back into space.

Concrete has a lower albedo which means that it absorbs more of the sun's UV rays, which makes the material hotter.

Because cities have so much concrete, whether it is from buildings or roads, it retains heat much more than surrounding countrysides



Blocking UV rays

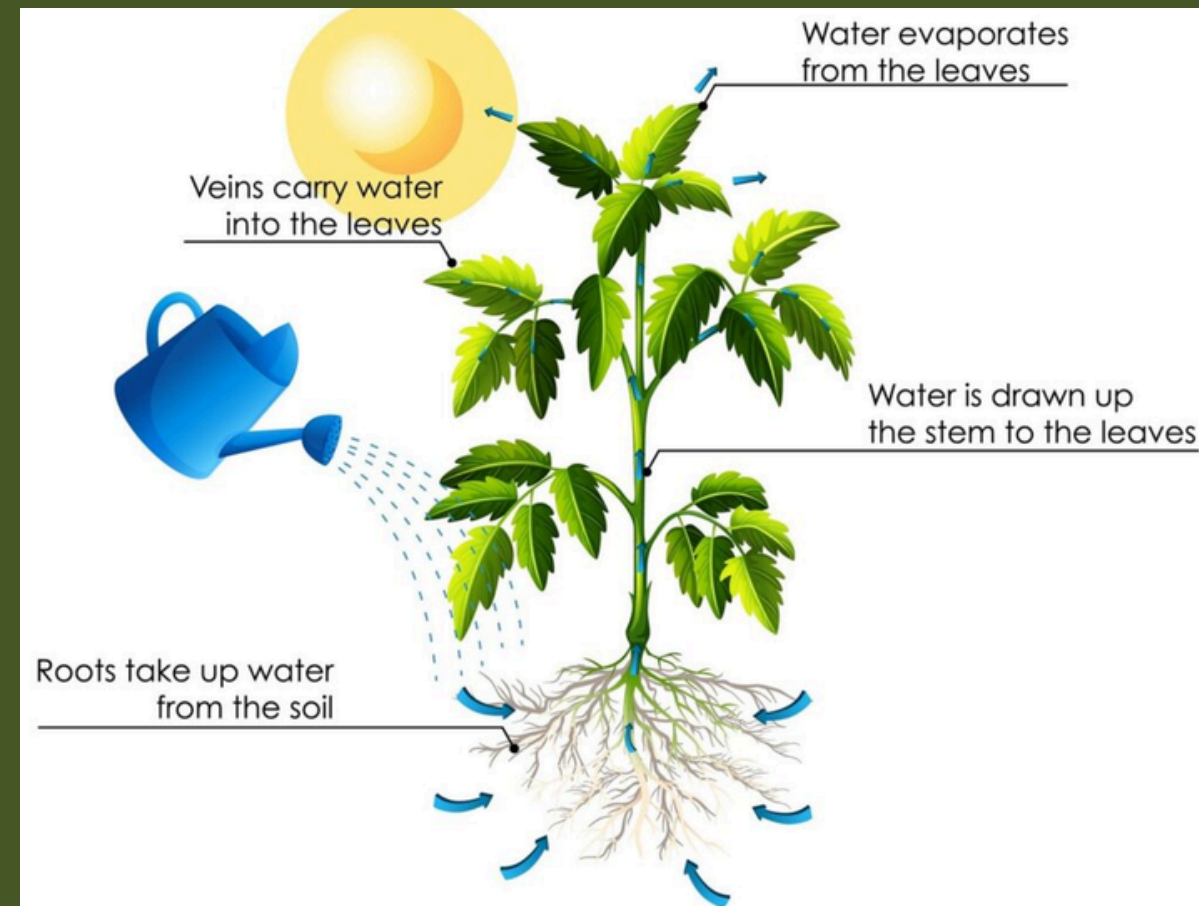
Trees block the sun's UV rays which prohibit concrete from absorbing the heat. In addition, trees are able to reflect the UV rays back into the atmosphere, whereas concrete absorbs them, allowing it to keep and retain heat for a longer period of time.



Transpiration

The second mode of cooling is called transpiration.

Transpiration is the process of plants taking up water and releasing it from their leaves, which cools the area around the tree even further. This is a lot like how humans sweat.



Trees as Heat Mitigators

Trees can reduce heat by:

- blocking the sun's UV rays from hitting the ground
- transpiration

Benefits to the Ecosystem

How are urban trees essential to rebuilding lost ecosystems?

Urbanization has increased immensely through the years. According to the US Census Bureau, about 80% of Americans now live within cities, which means that a lot of natural ecosystems have been decimated to accomidate rapid growth.

From rebuilding habitat to regulating the climate, urban forests help mitigate some of the damages done by deforestation.



Urban Forest Ecosystem Benefits



Clean Air

Trees clean the air through photosynthesis, which converts carbon dioxide into oxygen. They are also able to filter out toxins like ozone and sulfur dioxide by absorbing it through their leaves. In addition, the rough texture of its bark and leaves act as a trap for physical matter such as dust.

Climate Regulation

Trees regulate the climate by sequestering tons of pounds of carbon throughout their life and by cooling the air through transpiration.

Check out I-Tree to explore benefits!



Decrease Erosion

Trees can help decrease erosion because their roots act as an anchor and stabilize the soil.

Fun fact: Did you know that sediment is the largest pollutor of waterways due to urbanization?



Provide Habitat

Trees provide habitat to wildlife that have been displaced from expanding cities. Wildlife is essential to keeping the ecosystem balanced as each organism has a vital purpose. Humans rely on wildlife for many reasons such as pollination, pest control, etc.



Stormwater Mitigation

Trees help mitigate flooding by slowing down rainfall. Flooding can occur when water is not able to absorb into the ground because it is travelling too fast. Trees act as a buffer between heavy rainfall and the ground so the soil is able to absorb the water much easier.

Clean Water

Trees clean the water, by drawing up toxins into their roots and storing it within their tissue. Urban waterways tend to be dirtier due to things such as oil from cars, sediment, and other toxins flowing from streets to drains which ultimately end up in the river.



Human Benefits

What cultural benefits do trees provide?

The benefits that trees provide humans include increased mental health, aesthetics, community identity, and recreational use.

In addition, trees can save community members money based on the species and where they are located relative to their home!



Human Benefits



Increased Health

Forests in urban areas can reduce blood sugar, lower cortisol levels, improve attention, reduce anxiety, improve immune systems and much more!

Community Identity

Trees help to foster a sense of pride and uniqueness to communities. They can act as a historical monument, a gathering place, and encourage neighbors to interact as it makes it easier to go outside because the shade provides relief from the heat.



Recreational Use

Trees are used for recreation whether it is a single swing on a tree or a scenic hike through a forest. Knoxville's Urban Wilderness provides opportunities such as hikes, mountain biking, outdoor classrooms, and much more all thanks to the extensive urban forest!



Aesthetics & Community Investment

Not only are trees effective, they are also beautiful! Although beauty is objective, many agree that trees and green spaces are much more appealing than barren concrete jungles. In addition, trees improve mental health and mood which can directly impact community well-being.



A photograph of a blue house with a red door and a tree in the foreground. The house has a blue shingled roof and a white door frame. A red mailbox is mounted on the wall to the right of the door. A large tree with green leaves is in the foreground, partially obscuring the house. The right side of the image has a dark green overlay with white text.

Save Money!

Adding trees close to streets, buildings, and homes can help shade them from absorbing UV rays, which cools the area around it.

By doing this, air conditioning systems save energy on cooling as they don't have to work as hard when the building is cooler to begin with. This saves both money for the homeowner and emissions from entering the atmosphere!

Check out i-Tree to measure how much money you can save with each tree: <https://www.itreetools.org/>

Learn More!

Tennessee Forests and Woodlands: <https://www.nature.org/en-us/about-us/where-we-work/united-states/tennessee/stories-in-tennessee/saving-a-forest-saving-the-earth/>

The Power of Urban Trees: <https://www.climatecentral.org/climate-matters/the-power-of-urban-trees-2023>

What are Urban Heat Islands and Why Do They Matter?: <https://unu.edu/ehs/article/what-are-urban-heat-islands-and-why-do-they-matter>

6 Ways Urban Trees Benefit Our Climate and Health: <https://www.clf.org/blog/urban-trees-benefit-our-climate-and-health/>

Study: Trees have \$31.5 Billion on Home Values Each Year: <https://news.unl.edu/article/study-trees-have-315-billion-impact-on-home-values-each-year>



Thank You!

Please feel free to contact
me if you have questions or
are just interested in
learning more!

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