

City of Tampa's Urban Forest *Greenhouse Gases*



Carbon Storage and Sequestration

How do urban forests help to store and sequester carbon?

As trees grow they remove/sequester carbon dioxide (CO₂) from the atmosphere to use during photosynthetic processes. Trees store carbon in the woody tissue and release oxygen into the atmosphere. A growing tree sequesters carbon each year and stores it, keeping carbon out of the atmosphere. The amount of carbon sequestered and stored over time is a function of a tree's size, condition, and lifespan. Young trees tend to sequester carbon at higher rates than older trees due to their greater vigor. Long-lived trees store carbon for a longer period of time than shorter-lived trees because when a tree dies most of the stored carbon is released back to the atmosphere as it decomposes. The time span for carbon storage can be extended if the wood from the tree is used to make a product (e.g. furniture).

Why is storing and sequestering carbon important?

Over time, the global carbon cycle has fluctuated and currently the concentration of CO₂ in the atmosphere is increasing. There are many sources of CO₂, but one of the largest sources over the last century has been the burning of carbon rich fossil fuels (oil, coal and natural gas). CO₂ is a greenhouse gas, which means that its accumulation in the atmosphere is raising average global temperatures and contributing to climate changes worldwide. These changes in temperature and climate may lead to changes in rainfall and storm patterns, and they may contribute to possible rising sea levels. These impacts may have long term ecological, economic, social, and political effects for us and future generations.

How do we help urban forests store and sequester carbon?

In order for trees to sequester and store as much atmospheric carbon as possible, they need to be healthy. Trees in our communities need to be actively managed to maintain their optimal health. This management comes at a cost, but it pays dividends as well because it represents an investment by the community in the long-term health and vigor of the urban forest. Just as we want to encourage the management of the living trees, it is important to recognize the role of dying and dead trees. These serve an ecological role by providing ecosystem services and habitat for wildlife. In Tampa, the urban forest sequesters more carbon than it emits, and this amount can be increased over time through sound management of existing and newly planted trees. However, overall urban forests sequester only a fraction of the total amount of greenhouse gases emitted in the city (Andreu et al. 2008a).

What is the value of stored and sequestered carbon in Tampa's urban forest?

Carbon credits are a commodity. They are bought and sold in many parts of the world today. Therefore, the amount of carbon sequestered by the trees in Tampa's urban forest has a monetary value. The total carbon stored in Tampa's urban forest is estimated to be over 500,000 tons and has a value of \$10.3 million if sold at ~\$20 per ton. The total carbon sequestered by Tampa's urban forest is about 46,530 tons per year, which represents approximately \$1 million annually. Carbon markets are dynamic in the same way that stock markets are, so the dollar value of carbon sequestered continually fluctuates.

