URBAN TREE CANOPY ASSESSMENT

An Urban Tree canopy assessment can help a community assess its present state and set goals for its future state.

An Urban Tree Canopy (UTC) Assessment is different from an urban tree inventory. UTC studies of tree canopies are based on the computer-aided interpretation of aerial photographs or satellite imagery. UTC data tend to be very precise regarding the location of trees and the extent of tree canopy. However, at this time most UTC analyses cannot provide detailed information on individual tree species or condition.

WHY CARRY OUT A UTC ASSESSMENT?

A UTC Assessment can help increase awareness of the urban forest, with concrete information to engage and discuss with decision makers to understand their urban forest resources, such as the amount of tree canopy that currently exists and the amount that could exist. It also can:

- identify vulnerable populations that lack equal opportunities to experience urban green space and understand patterns of environmental justice;
- allow communities to prioritize planting/greening goals based on social, economic, and ecological criteria such as flooding, wildlife habitat, urban heat island/heat stress, public health (e.g., asthma), crime, income, and other variables;
- form tree canopy goals and prioritize locations for tree planting efforts;
- establish urban forestry master plans, inform sustainability plans, and justify budgets;
- track change in the urban forest over time, and goal success;
- can be used to show the value of ecosystem services provided to the community;

There are several ways to assess forest distribution and structure:

Ground-based – involves random sampling to determine the physical attributes of the vegetation and other surface characteristics. This labor-intensive, ground-based information can determine many critical forest attributes that cannot be obtained from aerial imagery (e.g., number of trees, tree sizes, species composition, leaf area and biomass, tree biomass). This structural information is quantified for the tree population to aid in urban forest management (e.g., by providing total tree species distribution by land use; risk to various pests) and in quantifying ecosystem services. I-Tree Eco is a tool for ground-based assessments.

Aerial – uses aerial imagery to develop cover maps (e.g., from high-resolution color-infra-red digital images or medium resolution satellite data) or determine percent cover types (e.g., photo-interpretation) within the area of interest. These provide a quick estimate of the tree and other surface cover but provides only limited two-dimensional information on the vegetation.

GIS-based tools – (Geographic Information System) use maps and other layers of geographic information within various application programs to do certain analyses – like determining where new tree plantings would yield the

RELATED RESOURCES

Introduction to UTC

USFS Urban Tree Canopy Assessments

US Climate Resilience Toolkit

Landcover Change & analysis

most benefits or modeling the ecological impacts of new development. There is a range of tools that vary in complexity and cost: i-Tree Canopy is a free program that uses digital aerial images and random points to determine cover type manually, providing a statistical estimate of tree canopy cover and ecosystem services with a known error of estimation. UTC assessments offered by consultants use satellite imagery and is more expensive but provides more detailed information about land cover, as well as estimating benefits and possible tree planting sites.
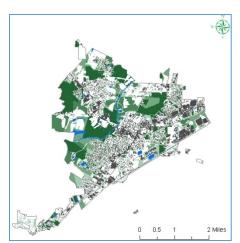
Remote Sensing tools – are more advanced and use either reflected light and can essentially see through shadows, or uses the electromagnetic spectrum. For example, LiDAR (Light Detection and Ranging) is a is not affected by shadows cast by tall buildings and can provide more accurate mapping of the canopy distribution, combined with information about the structure of the urban forest. This technology may be beyond what most smaller communities need, but if your community has multiple applications for the data it could be worth it.

WHAT UTC ASSESSMENT TO USE?

Think about these questions:
1. Do you have an urban tree inventory or are you trying to make the argument that one is needed?
2. Are you a small community or a large one? What kind of budget or staffing do you have?
3. How large of an area do you want to assess?
4. What is your capacity?
    a. Do you rely on GIS map layers for managing, making decisions and communicating with other departments? Are you able to use the information you get?
    b. Do you have the budget, staff time, software required, technical expertise to input and interpret?
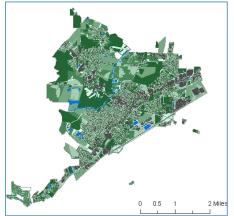
i-Tree Canopy can be a good choice for small communities which do not have an inventory and want to use the information to get buy-in from the community. It is also more appropriate for communities that are not reliant on GIS map layers to manage other aspects of the community. If a community is poised to start relying more on GIS and has trained staff, they might want to consider a UTC.

If the capacity of a community to use a UTC assessment as a GIS layer, then you can break out the canopy by different boundaries and priorities. Depending on the size of the project and the level of analysis (basic to advanced) the cost of a full assessment can range from $5,000 to $100,000.

Existing canopy ↑   Possible canopy ↓

URBAN & COMMUNITY FORESTRY PROGRAM (U&CF)
Urban Tree Canopy Assessments

Carrying out a UTC assessment may be helpful to a community trying to start a conversation about its trees and the importance of management and planning or working to prioritize and track the success of its efforts. A UTC assessment is a community action eligible for funding (1:1 cost match) through the U&CF Grant Program, which can assist with the determining the level of community need and capacity and the best approach for an assessment.

Look at the grant pages on the DFE website and then contact the U&CF Coordinator for further information.