i-Tree: Measuring the Urban Forest

UFORE, developed by the U.S. Forest Service, is one of the main programs in the i-Tree suite. UFORE (Urban Forest Effects Model) uses field data to estimate the economic and ecosystem service impacts of trees in a neighborhood, city, county, or state.

The U.S. Forest Service has developed a set of free and easy-to-use software programs and protocols (together called i-Tree) that help urban foresters measure and understand their forest resources.

Used separately or together, the programs and tools in i-Tree can aid urban forest planning, management and budgeting, and allow comparisons between the urban forest resources in different communities or cities.

UFORE (which stands for Urban Forest Effects model) is one of the main programs in the i-Tree suite. UFORE uses field data to estimate the economic and ecosystem service impacts of trees in a neighborhood, city, county, or state. It utilizes standardized data collection protocol to gather on-the-ground information. For small study areas, all trees can be sampled, but it is more common to sample randomly located tenth-acre (0.1 acre) plots spread across a study area of any size. Field crews visit each plot and record canopy cover, land use, ground cover, and a range of measurements for trees and shrubs in the plot. The UFORE modeling program uses these data to describe the structure of the urban forest, including estimated tree species counts and composition, diameter size class distribution, diversity, and canopy cover. UFORE also estimates the urban forest's net impacts on energy use, carbon storage, and air pollution using scientifically derived and tested equations.

STRATUM (Street Tree Management Tool for Urban Forest Managers) is a similar inventory and analysis tool that focuses on street trees and tree management issues. Like UFORE, STRATUM can use existing or newly sampled data to describe the structure and composition of the street tree population. STRATUM also analyzes the trees' environmental benefits and contrasts these benefits with maintenance costs.

Three other simpler programs are also available in i-Tree. The Mobile Community Tree Inventory (MCTI) software helps users produce a basic inventory and analysis of local forest resources. The Storm Damage Assessment Protocol offers simple and efficient methods for collecting tree damage information after a severe weather event. Finally, a new stand-alone Species Selector Utility helps users decide which tree species to plant based on desired environmental effects like stormwater management, wind protection, or air pollutant removal.

A range of support tools is available to i-Tree users. A software program is available to generate randomly located plots for UFORE and STRATUM. Another support tool facilitates data entry directly into handheld personal data assistants (PDAs) for UFORE, STRATUM, and MCTI. Contact information for real person support is available on the website, and there is a forum that invites users to share ideas and experiences or seek solutions to common data collection or analysis problems. The new i-Tree Bug Reporting and Tracking System, also available on the website, collects user feedback for the software developers to help them improve future versions of the programs.

More information and order forms for free copies of the i-Tree program are available at www.itreetools.org.

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