Managing Dallas' Urban Forest
Research Project of the Dallas Urban Forest Advisory Committee
In conjunction with the University of Texas at Dallas, the City of Dallas, the Dallas Park and Recreation Department and the Dallas Parks Foundation

BACKGROUND

In December 2005, the Dallas City Council established the Dallas Urban Forest Advisory Committee as a permanent part of city government to serve in an advisory capacity on matters of environmental stewardship specifically concerning the care and planting of trees and the urban forest. The Committee is authorized to study, plan, advise, report and make recommendations for the care, conservation, planting, pruning, removal or disposition of trees citywide.

The City of Dallas covers 364 square miles which includes almost 22,000 acres of park land and 5,495 street miles. The majority of the trees in Dallas are on privately-owned land.

In order to fully develop future forest management plans and make informed recommendations on city codes regarding trees, it is imperative that an urban forest survey and analysis be completed to provide the baseline data required.

New technology, hyperspectral imaging, has recently been developed that will aid in this effort. The Committee approved a pilot project to test the technology and its viability for a large-scale survey. By cataloging spectral signatures of the 250 species of trees found in the Dallas area, aircraft carrying highly specialized equipment can fly over an area and map all the existing surface features including water.

Dr. Fang Qiu, an associate professor of GIS and Remote Sensing Geospatial Information Sciences at the University of Texas at Dallas, is the lead researcher on the project. UTD has the computers and specialized software to interpret the data using specific algorithms written for each species of tree to pull out data for that tree, its height; girth and canopy spread, and place it on a map.

TODAY

UTD students gathered five foliage specimens from each of 250 species of trees. Each was tagged with a GPS locator and read with a radio spectrometer to determine if accurate high resolution spectral images could be distinct enough to be isolated and identified from other species. This initial research cost was $13,000 and was paid for by a tree care expert company owned and managed by the committee chair.

NCDC Imaging was hired by the Committee to locate a plane with the necessary equipment to acquire the images. They subcontracted with Terra Remote Sensing, a Canadian company with the only plane for the project. The cost for the two-day flyover was $59,200, encompassing Turtle Creek and Reverchon Park and the White Rock Lake area in August (delayed until September). A down payment of $23,600 was made by the Urban Tree Forest sub fund at the Dallas Parks Foundation. The remainder is due when the data is delivered to Dr.Qiu.

Dr. Qiu and the University of Texas at Dallas were hired to process the images using various algorithms to map the characteristics of each tree in the test area. The cost for this was $37,000. The first half was paid by the Dallas Urban Forest Advisory Committee sub fund at the Dallas Parks Foundation. Due to a delay in receiving the data, the analysis has not been completed, so there is an outstanding balance of $18,500.

To date, Steve Houser, the chairman of the Urban Forest Advisory Committee, has raised $74,000 of the required $96,000 for the project. **$22,000 is needed to complete the pilot.**

BENEFITS

If the pilot is successful, it could be replicated for the entire city (estimated cost $800,000 as compared to the more than $1 million estimated cost for a visual survey sampling). The data would be invaluable to the development of the Trinity River Project, for land developers, for the Dallas Parks and Recreation department to plan tree planting and maintenance; for the Dallas Streets and Water departments to look at storm water runoff, quantity and quality; for the street department to assess the condition of color-based road markings, etc.

Invasive tree disease (e.g. Oak Wilt) and non-native plants (e.g. Chinese privet) could be identified early and contained. With baseline tree inventory data collected, computer modeling (e.g. UFORE, Stratum or itree) will quantify the benefits to air quality, storm water runoff, energy savings and forest value. The potential benefits are many.

For further information on the entities involved in this project, please see:

www.utdallas.edu/~ffqiu/

www.NCDCImaging.com

www.TerraRemote.com

www.dallascityhall.com/parks/forestry/index.html