Value and Benefits of Public Trees

i-Tree Eco Model Overview

i-Tree Eco Results

i-Tree Eco Model

Overview

- i-Tree Eco is a module within the suite of i-Trees peer-reviewed tools developed by the USDA Forest Service Northern Research Station.

- Used primarily to identify, monetize and manage forest related elements.

- Reports generated by i-Tree describe economic and environmental benefits and costs, structure and composition of local trees, health benefits to communities and an overview of tree health.

i-Tree Eco Model

Model Weakness

 Current data collection is incomplete, only public tree numbers have been entered into the model.

 Tree species benefit and cost pricing is based on information from Charlotte, NC. Though this is a highly studied location it may not accurately reflect local trees.

 Individual methodology for collection differs for each person involved and may affect data and results.

Model Strengths

 Allows for changes to the benefit pricing to accurately portray local environmental and economic information.

 Widely accepted modeling system in the United States, used worldwide for valuation of forest elements.

i-Tree Eco Results

Ecosystem Functions and Values

- Austin public trees remove an estimated 803 metric tons of pollution annually, providing an annual pollution removal value of $4.87 million.

- The urban forest in Austin stores an estimated 458,000 metric tons of CO_2 in existing tree growth valued at $6.01 million and an additional 38,200 metric tons of CO_2 being removed annually valued at $501,000 per year.

- Austin trees intercept and permeate an estimated 1.21 million cubic meters of rainfall annually reducing runoff.

- Public trees in Austin are estimated to produce 57,800 metric tons/year of Oxygen.

i-Tree Eco Results

Urban Forest Structure

- Number of trees in Austin on public land and Rights of Way currently estimated at 7.34 million.

- Tree canopy cover on Austin public areas is estimated to be 38.6%.

- Three most common public species are Ashe juniper, Cedar elm and Live oak constituting 74.5% of the urban forest.

- Percentage of trees less than 6" diameter is estimated to be 55.0%

- Estimated replacement value for all public trees is $4.02 billion.

Benefit Pricing

Summary

૭ Utility benefit pricing numbers were adjusted from i-Tree defaults to provide a more accurate scope of Austin's public tree benefits.

- Price of avoided runoff was given a suggested range of $0.0125 - $0.025 tentatively based on WPD calculations until more information on how i-Tree calculates this number could be verified. A zero value as well as $0.0125 was submitted for initial reporting.

- Price of carbon at $13.12/Metric Ton was calculated using EPA website information.

- Price of electricity at $0.071/kWh was calculated by averaging the highest use summer and winter rates according to Austin Energy's website tables.

- Census data was incorporated from the 2012 estimate on the Census Bureau website which estimates Austin's population at 842592 for 2013.

Effects of Canopy Cover on Crime Rates and Property Values.

Texas State Crime analysis

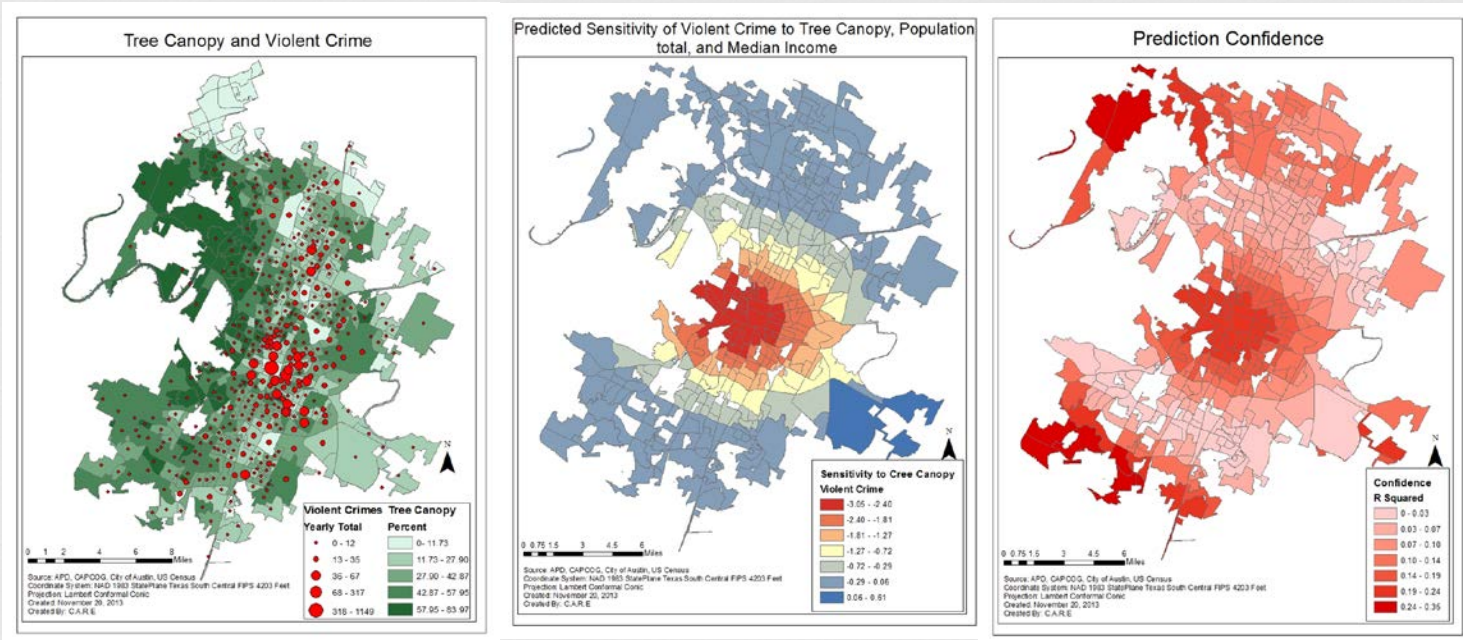Texas State Property value analysis

Crime Analysis

Overview

- The USDA Forest Service conducted research in Portland, Oregon and Baltimore, Maryland to determine if there was a relationship between tree canopy coverage and crime rates. Minneapolis recently conducted a similar project that demonstrated large tree canopy coverage can lower crime rates.
  - Initial findings in Portland showed a weak link in one district of residential property.
  - Baltimore expanded its study from residential to include industrial and commercial as well demonstrating a stronger correlation between canopy cover and crime.

- A group of Texas State University undergraduate students were asked to do a statistical analysis of canopy cover links to crime rates for Austin and report on their findings.

Texas State Analysis

Crime Analysis Findings

Modeling indicates downtown areas are more affected by prevalent tree canopy cover.

Based on model information, increasing total city canopy cover will reduce crime across Austin.

Property Value Analysis

Overview

- The USDA Forest Service states that healthy, mature trees add an average 10 percent to a property's value.

- For this study additional explanatory values were chosen including percent tree canopy cover, Texas Education Agency (TEA) school rankings, proximity to cultural attractions and proximity to natural areas.

- The same Texas State University undergraduate student group was asked to analyze the effects canopy cover have on property values.
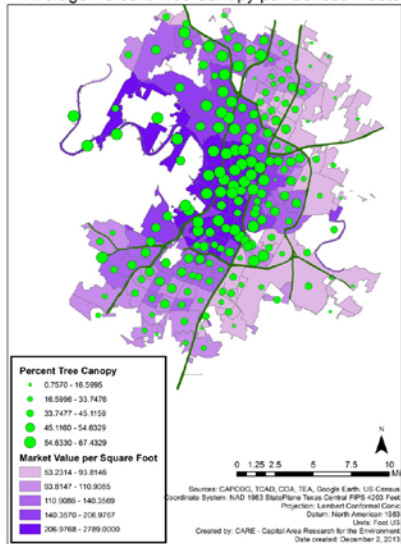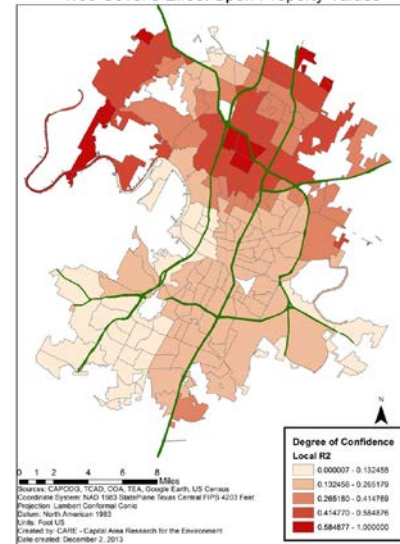
Texas State Analysis

Property Value Analysis

- Complete analysis shows a positive relationship for canopy cover on single family property values.

Average Property Prices per Square Foot and Average Percent Tree Canopy per Census Tracts

Degree of Confidence for Analysis of Tree Cover's Effect Upon Property Values

- Results indicate all property values in Austin would increase from additional canopy coverage.

Next Steps

Full i-Tree Eco Data Collection and Analysis

- Planned for Summer 2014
- Urban Forestry Program and City Arborists Office
- Public and Private Property

TreeKeeper 7 – Tree Management Software

- Inventory and tree management software
- Field hardware will allow tree work management and inventory in the field