

SUMMARY OF
AMERICAN FORESTS
URBAN ECOSYSTEM ANALYSIS

6/6/06

American Forests is a non-for-profit organization founded in 1875 and based in Washington D.C. The process of an Urban Ecosystem Analysis helps developed regions like Wellington to understand how their tree canopy cover has changed overtime and from natural disasters. They have developed a resourceful tool for municipalities and other agencies to access the value of their "green" infrastructure. On average American Forests has a target goal for municipalities the similar to Wellington to have tree canopy coverage of 40 - 50%.

CITYgreen for ArcGIS

This program uses raster data land cover classification from high resolution imagery for analysis. It functions as an extension of the already existing GIS platform and ArcGIS. From this analysis a Green data layer has been created for Wellington. This layer utilizes the CITYgreen program to interpolate 1 meter multispectral imagery and create this layer using specific land cover categories. These categories are divided into:

- Impervious Surfaces
- Open Space - Grass/Scattered Trees
- Trees
- Bare Soil
- Water

Once the land cover has been created, CITYgreen uses a series of formulas to calculate its totals for the analysis.

TR-55 for Stormwater Runoff: This calculation incorporates volume of runoff formulas from the Urban Hydrology of Small Watersheds model, developed by the US Natural Resources Conservation Service. The formulas have been customized to determine the benefits of trees and other urban vegetation with respect to stormwater management.

L-THIA for Water Quality: This model estimates the change in concentration of the pollutants in runoff during a typical storm event given the change in the land cover from existing trees to a no tree condition. This model estimates the event mean concentrations of nitrogen, phosphorus, suspended solids, zinc, lead, copper, cadmium, chromium, chemical oxygen demand, and biological oxygen demand.

UFORE Model for Air Pollution: Citygreen uses formulas from a model developed by the USDA Forest Service. The model estimates how many pounds of ozone, sulfur dioxide, nitrogen dioxide, and carbon monoxide are deposited in tree canopies as well as the amount of carbon sequestered.

city Green computer program

Wellington Analysis Findings Summary (Attached map and Report)

An Urban Ecosystems Analysis of Wellington was run using multispectral imagery from December 2005. The analysis shows that only 13.2% (2,851.6 acres) of Wellington has a tree canopy developed. 23.0% (4,974.7 acres) are impervious surfaces which are building, parking lots, roads, or any structure that does not allow water to permeate to the ground. 50.2% (10,840.1 acres) is open space – grass/scattered trees; 4.4% (953.2 acres) is urban or bare soil; and the remaining 9.2% (1,978.1 acres) is water.

The attached report also finds the quantity of water runoff, water quality (contaminant loading), and air pollution removal benefited from Wellingtons tree canopy. This number was calculated using only the urban or developable land in Wellington