



## i-Tree Eco

Developed by: **USDA Forest Service**  
 Launched in 2006; Updated in 2019

### CATEGORY

Managing and Monitoring Forest-Related Projects, Maximizing Carbon Benefits, Maximizing Health Benefits, Planning Forest-Related Projects, Valuing Trees and Forests

### REGION

Developed for U.S. cities, and adapted for use in Australia, Canada, the US, the UK, the EU, and Mexico, but potential to be used globally. May require use of [i-Tree Database](#) for global users.

### FOREST LEVEL

Inner Forest & Nearby Forest

### SCALE

Sub-national, Municipality, Project

### RESOURCE TYPE

Analysis Tool

### EXPERTISE LEVEL

Any

### INPUT DATA REQUIRED

Requires tree inventory (plot-based or individual trees)

### OUTPUTS

Report with estimation of urban forest structure, potential pest impacts, monetary values of trees, ecosystem services and benefits; forecasting of forest structure and benefits

### LANGUAGE

English, Spanish

### COST

Free

### ADDITIONAL GUIDANCE

[Download the User's Manual.](#)

### CONTACT

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## Why Use the Tool

**i-Tree Eco Version 6**—part of the **i-Tree Suite**—is a flexible software application designed to use data collected in the field from single trees, complete inventories, or randomly located plots throughout a study area along with local hourly air pollution and meteorological data to quantify forest structure, environmental effects, and value to communities. **i-Tree Eco analyzes a variety of forest benefits and disbenefits, including wildlife habitat suitability, carbon sequestration, and impact on hydrology. It can assess forest structure, including composition and species diversity. It can even forecast future benefits while accounting for planting efforts, extreme weather, and annual mortality rates.**

## Recommended Tool

Cities4Forests recommends i-Tree Eco as it uses a rigorous sampling and data collection process, has been widely used and tested, and provides key information on the benefits of trees and forests. Using in contexts outside of the United States may require additional land-use data and expertise to ensure the model remains accurate.

## Past Use Cases

Used globally, including in Barcelona, Spain, Providence, RI and Milwaukee, WI.  
[See reports here.](#)

## Supporting Partners

Davey Tree Expert Company, Arbor Day Foundation, Society of Municipal Arborists, International Society of Arboriculture, Casey Trees, and SUNY College of Environmental Science and Forestry



## CASE STUDY

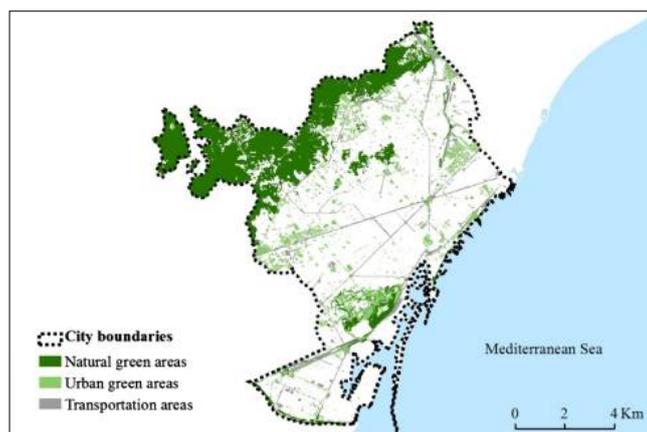
### Value of Trees to Air Purification in Barcelona

Barcelona, Spain, is one of Europe’s most densely-populated cities. Like many other European cities, Barcelona struggles with air quality problems and is seeking ways to meaningfully improve air quality and regulate climate in the city.

To quantify the benefits and costs related to air quality and climate regulation that urban trees bring to Barcelona, researchers applied the i-Tree Eco tool. In May and June of 2009, researchers collected field data from 579 randomly selected plots within the city, recording land use, tree cover, and—when applicable—species and size data. They also relied on pollution data from the Public Health Agency of Barcelona (ASPB) and the US National Climatic Data Centre, as inputs to i-Tree Eco.

The total value of the air purification provided by Barcelona’s trees was estimated at about \$2.38 million USD/year (305.6 tons/year), with PM10 being one of the major pollutants removed. The value of the urban forest’s carbon sequestration was estimated at \$407,000 USD/year (net 5187 tons carbon/year sequestered). The researchers also estimated the value of air pollution by urban trees (from emissions of organic compounds) at 183.98 tons/year.

Although these numbers represent relatively modest pollution removal (about 0.5-3% of total pollutants), i-Tree can also be used to calculate the other co-benefits provided by urban trees. In general, the ability to quantify both costs and benefits is invaluable when communicating with policy-makers and stakeholders.



Source: Baró, F., Chaparro, L., Gómez-Baggethun, E., Langemeyer, J., Nowak, D. J., & Terradas, J. (2014). Contribution of ecosystem services to air quality and climate change mitigation policies: the case of urban forests in Barcelona, Spain. *Ambio*, 43(4), 466–479.