

## i-Tree Eco

### What Is i-Tree Eco?

i-Tree Eco version 6 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.

Eco v6 is a model that uses tree measurements and other data to estimate ecosystem services and structural characteristics of urban or rural forest.

Eco is a complete package that provides:

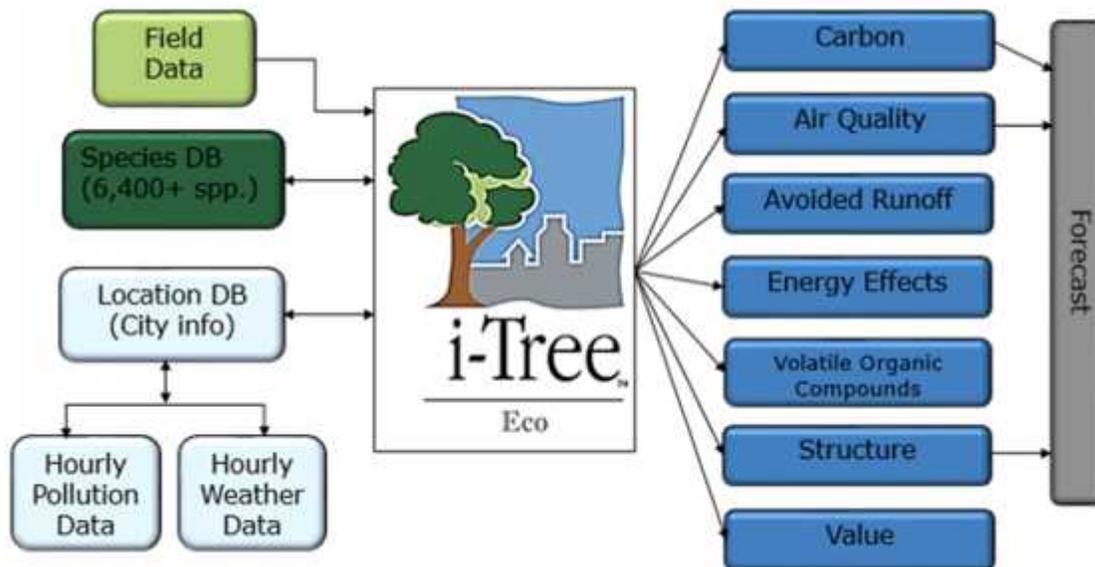
- **Sampling and data collection protocols** - For plot-based sample projects, total population estimates, and standard error of estimates are calculated based on sampling protocols. For complete inventories, eco calculates values for each tree.
- **Flexible data collection options** - Use the mobile data collection system with web-enabled smartphones and tablets, or traditional paper sheets.
- **Automated processing** - A central computing engine that makes estimates of the forest effects based on peer-reviewed scientific equations to predict environmental and economic benefits.
- **Reports** - Summary reports that include charts, tables, and a written report.



### Eco Model Basics

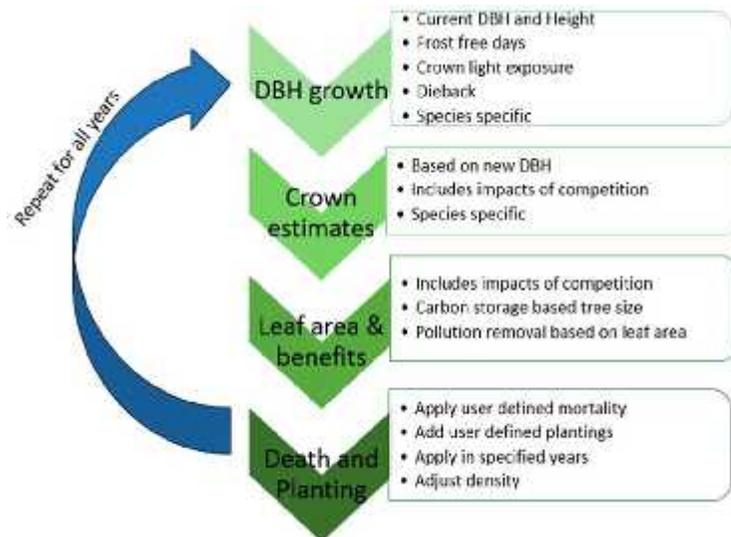
#### How Eco Works

Tree measurements and field data are entered into the Eco application either by web form or by manual data entry; they are merged with local preprocessed hourly weather and air pollution concentration data. These data make it possible for the model to calculate structural and functional information using a series of scientific equations or algorithms.



### Forecast Modeling

The new forecast module can be run after Eco results are generated. Forecast uses structural estimates, environmental and location variables, species characteristics along with growth and mortality rates to forecast future tree DBH and crown size. Forecasted benefits such as pollution removal, carbon storage and carbon sequestration are then estimated based on the projected tree growth and leaf area. Tree planting inputs, pest and disease impacts, and storm effects can be modeled also.



### i-Tree Eco Is Currently Designed To Provide Estimates Of:

- **Urban forest structure** - Species composition, number of trees, tree density, tree health, etc.
- **Pollution reduction** - Hourly amount of pollution removed by the urban forest, and associated percent air quality improvement throughout a year. Pollution removal is calculated for ozone, sulfur dioxide, nitrogen dioxide, carbon monoxide and particulate matter 2.5 (<2.5 microns).
- **Public health impacts** – Health incidence reduction and economic benefit based on the effect of trees on air quality improvement for the United States only.
- **Carbon** - Total carbon stored and net carbon annually sequestered by the urban forest.
- **Energy Effects** - Effects of trees on building energy use and consequent effects on carbon dioxide emissions from power plants.
- **Avoided runoff** - Yearly avoided runoff attributed to trees summarized by tree species or strata.
- **Forecasting** - Models tree and forest growth over time; considers factors like mortality rates, tree planting inputs, pest and disease impacts and storm effects. Some ecosystem services including carbon and pollution benefits are also forecasted.
- **VOCs** - Hourly urban forest volatile organic compound emissions and the relative impact of tree species on net ozone and carbon monoxide formation throughout the year.
- **Values** - Compensatory value of the forest, as well as the estimated economic value of ecosystem services.
- **Potential pest impacts** - based on host susceptibility, pest/disease range and tree structural value.

Not all reporting options may be available depending on project configuration, data options, and project country location.

### How Can I Get More Information About i-Tree Eco?

- Visit the i-Tree website at [www.itreetools.org](http://www.itreetools.org)
- Register online and download the free software
- Contact i-Tree support staff at [info@itreetools.org](mailto:info@itreetools.org)



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