



# i-Tree Hydro

State-of-the-Art, Peer-Reviewed, Public-Domain  
Process-Based Hydrological Model



Assessing How Changes in **Tree and Impervious Cover** Affect **Water Quantity & Quality**

Based on *Cutting-Edge U.S. Forest Service Science*

## What Hydro Can Inform Us About

- How management practices & urbanization affect water resources.
- How land cover changes impact water quality & quantity in watersheds, municipalities, and user-defined places nation-wide.
- Hourly & total results available in tabular & graphical form, including an automatically-generated Executive Summary report.

## How It Works

- **Data needs:** location; topography; weather; optional stream flow for calibration; land cover for initial case & optional alternatives.
- **Users inputs:** location, simulation period, and land cover information derived from i-Tree Canopy, NLCD data, and/or local knowledge.
- **Pre-loaded & increasing automated data inputs** with vast coverage in the U.S. for topography, weather data, and hydrological parameters.

## What's New: i-Tree Hydro version 6.0

- **Increased functionality & accessibility**, e.g. 4 scenarios can be paired with different parameter sets & canopy properties in a single project.
- **Easier-to-edit weather & streamflow file formats** enable users to customize their weather and streamflow inputs.
- **Detailed output graphs** for specific hydrologic processes including interception, infiltration, evapotranspiration, and more.
- **Customizable pollutant coefficient** (Event Mean Concentration) values can be set, instead of using the national U.S. average.

## How Can Hydro Help

- **By supporting decision-making to reduce stormwater damage** and improve urban forests, environmental quality, and human health.

## What's Planned for the Future – Projects, Partnerships, & Research

- **Green infrastructure:** tree pits; rain barrels; green roofs; rain gardens; and pervious pavement – each uniquely parameterized.
- **Design Rain tool** for simulating storms using regional NOAA data and Intensity-Duration-Frequency (IDF) curves for the U.S.
- **Improved water quality modeling**, including tool to identify pollution build-up & buffering hotspots, and database of pollutant coefficients specific to project location and effects of current land cover.
- **Localized soil & hydrology parameters** informed by the NRCS SSURGO database for users all over the U.S.
- **Spatial-distribution of model**, providing advanced users with localized land use decision-making support.

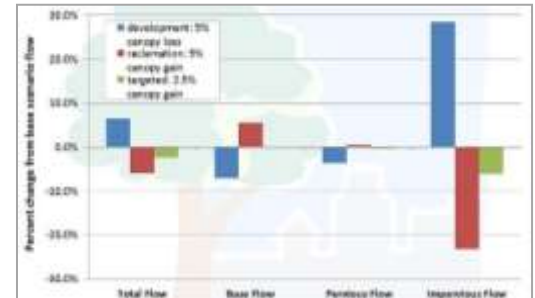


Figure 1: i-Tree Hydro simulation of alternative management scenarios as compared to initial conditions

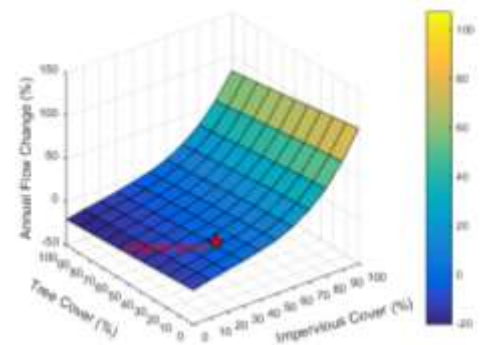


Figure 2: i-Tree Hydro simulated effects of incremental changes to Tree Cover and Impervious Cover in 161km<sup>2</sup> Rock Creek watershed near Washington, DC.

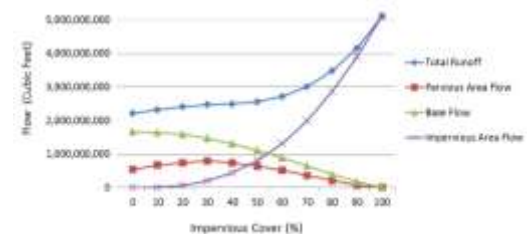


Figure 3: i-Tree Hydro simulation scaling Impervious Cover, with constant Tree Cover, in Rock Creek watershed near Washington, DC.

