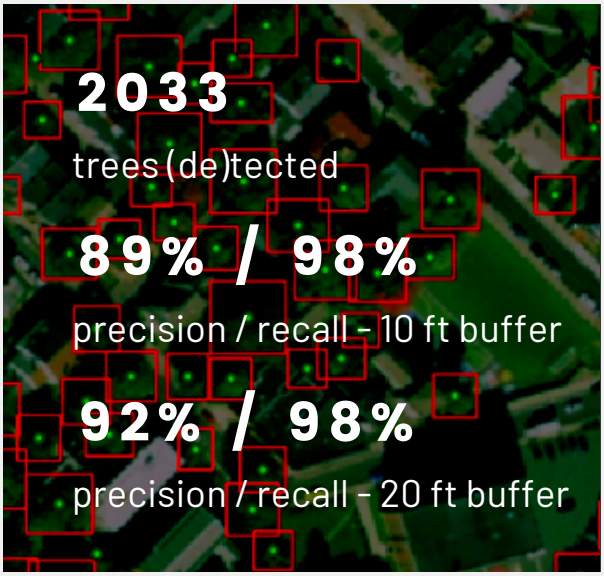
TreeTect *by Green City Watch*

A digital tree inventory prototype for part of Nubian Square

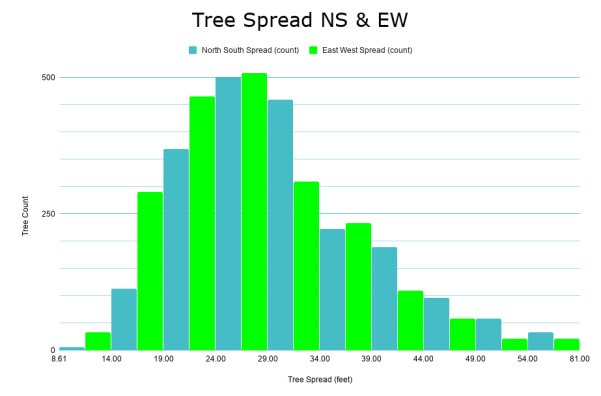
The foundation of any effective urban forest management program is a detailed tree inventory. A powerful tree inventory must be as dynamic as the trees themselves. TreeTect is an AI-enabled enhanced digital tree inventory which combines ecological expertise, satellite imagery, and machine learning to draw actionable insights about green space in near real-time.



Density of the 50% largest/greenest trees, showing mature, healthy trees cluster away from larger roads.

Relative tree health scoring based on NDVI values, indicating the poorest and the best performing trees.

In collaboration with the Mayor's Office of New Urban Mechanics, Department of Innovation and Technology Analytics Team, Parks Department, Environment Department, Office of Emergency Management, Boston Planning and Development Agency, and Speak for the Trees Boston, **Green City Watch applied TreeTect to part of Nubian Square to pinpoint individual tree location, size, shape, and condition.** Species ID was not possible under the constraints of this pilot.



The crown spread across east-west lines is generally larger than the north-south spread. Most main roads run north-south, indicating pruning or stunted tree growth across east-west lines.

The more mature the tree, the greater the benefits. **Yet, the average lifespan of an urban tree is only 13-20 years old—most never reach adulthood.** We propose a new framework for urban tree longevity, which addresses not only lifespan (living longer) but also healthspan (living better), to move towards optimal performance of the urban forest. Technology can play a crucial role in tree care, just as it does in human healthcare. TreeTect can 'treeage' the priority of tree care based on the severity of tree's condition.

To transition from reactive to proactive tree care, three vegetation indices were used: NDVI (Normalized Difference Vegetation Index), EVI (Enhanced Vegetation Index), and SAVI (Soil-Adjusted Vegetation Index). The unique combination of these three indices corrects for potential environmental influences and acts as an early warning system to alert tree managers to stressed trees—before it's too late.