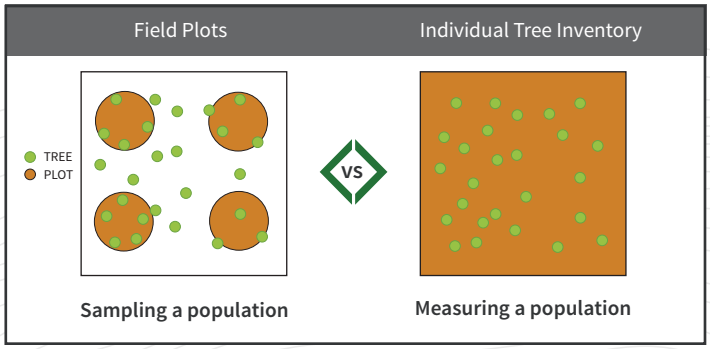
Advanced Vegetation Analysis

FORSITE
Forest Management Specialists

OVERVIEW

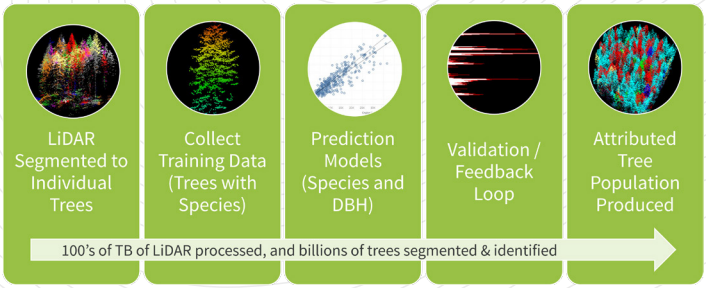
Tree inventories derived from high point density LiDAR data are changing the forestry business due to the increasing level of accuracy and detail achieved compared to traditional methods. At Forsite, we provide advanced vegetation analysis that includes intrusion codes (potential vegetation encroachments) for individual trees as well as health and/or species information for each tree.



Statistical extrapolation over the project area is helpful but lacks the precision and geo-specificity of a LiDAR individual tree inventory

treeid

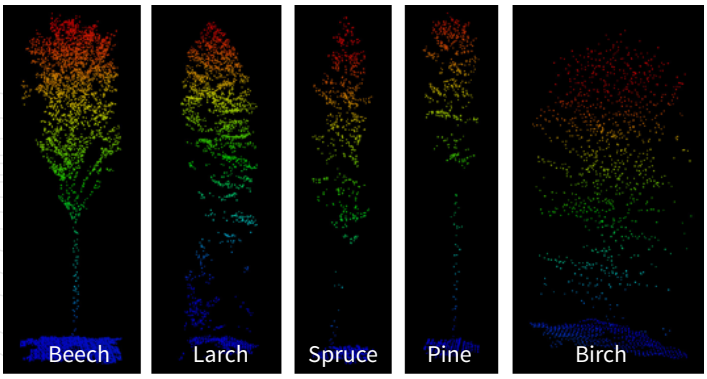
Forsite's innovative TreeID technology calculates individual tree inventories, providing species, tree height, and crown metrics. Once diameter (dbh) is predicted, biomass can then be calculated for each tree. TreeID can also output environmental metrics like carbon storage, pollution removal, and replacement value.



LiDAR Analysis - Tree ID Process

THE ADVANTAGE

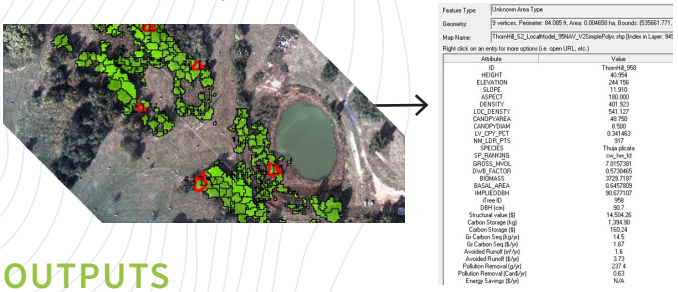
Health and species data helps identify high-risk trees as well as create species-specific growth projection. The identification of danger trees and branching issues with automated remote sensing allows field teams to quickly identify high-priority areas and reduce costs by leveraging human expertise and minimizing risk to people and property.



Ground truth examples from a recent project

INPUTS

TreeID requires LiDAR with a point density of 10 pts/m2 or higher to conduct a species identification. More point density is a benefit and provides TreeID a richer analysis foundation. Ground truth samples are selected from the project area and used to create the species identification model.



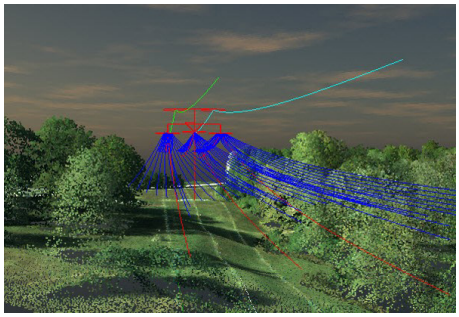
OUTPUTS

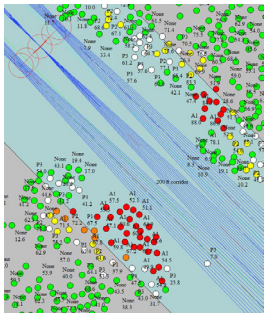
TreeID outputs are geospatial vector files (shapefile or *.gdb) compatible with any GIS system. Each individual tree is fully attributed with desired project metrics such as species, type (conifer/deciduous), and health (live/dead). Attributes also include standard LiDAR calculations like height, elevation, and slope; tree metrics like board feet or volume; and environmental metrics like carbon storage, pollution removal, and replacement value.

VEGETATION ANALYSIS WITH INTRUSION CODES

Sample Analysis Area 1

Standard industry requirements involve analysis of the point cloud to determine possible intrusion of vegetation with transmission and distribution lines. After automatically identifying danger trees and branching issues, field teams can rapidly identify high-priority areas and reduce costs by better leveraging human expertise and minimizing the risks to people and property.





Intrusion Codes and Tree Health

Overhead imagery and line models shown in Figure 1. Tree overlay with Fall-In intrusion codes in Figure 2.

Blue Canopy = Dead tree. Green Canopy = Live Tree. Intrusion code (None-green, P3-white, P2-yellow, P1-orange, A1-red).

Figure 1

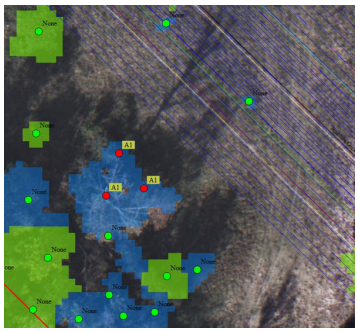
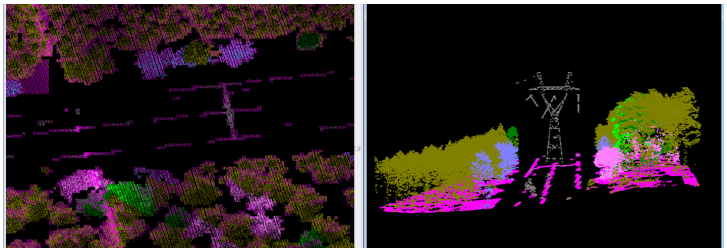


Figure 2

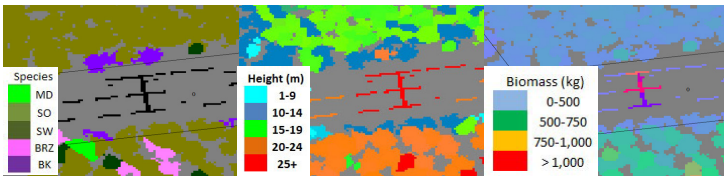
Sample Analysis Area 2

The following images show results from a standard TreeID analysis of the vegetation in a corridor. For best results, the LiDAR comes to us with man-made structures classified in the point cloud file so we can move right to the vegetation analysis.



LiDAR area classified by species

These images depict a sub-area of LAS section 097. According to the tree inventory information provided, the area is largely comprised of scots pine and TreeID agrees. The larger, taller trees are south of the corridor and here we find the more significant biomass. The table below summarizes the TreeID findings for the entire 19.6 ha area.



Species Height Biomass

097	MD	SW	SO	BZ	BK	TOTALS
TREE COUNT	18	212	4,889	134	583	5,836
Gross Timber Volume (m3)	9.4	241.6	2,235.1	78.4	415.3	2,979.8
Biomass (kg)	6,137.6	127,234.0	1,323,289.2	47,236.7	250,208.8	1,754,106.2
Basal Area (m2)	1.2	23.8	230.6	7.9	36.0	299.5
Average DBH (cm)	28.4	36.9	23.8	27.1	27.7	24.7
Average Height (m)	18.6	22.6	18.5	23.0	25.0	19.4
Average Canopy Area (m2)	17.7	12.6	13.1	22.3	16.9	13.7
Average Num Points	1,119	838	753	1,499	1,133	812

CONTACT US

Contact Mike or Maurice to learn more about Forsite's Advanced Vegetation Analysis services.

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