Gen-4 Optical Modeling & Acadian Forest Validation Summary

Version 2026.11 · Dieppe, New Brunswick · rootedcarbon.com/science

Summary of field-calibrated accuracy benchmarks for the Rooted Carbon Gen-4 optical vision and ecological modeling pipeline across mixed-wood Acadian validation plots.

Validation Benchmarks

- Aboveground dry biomass agreement: 94.1% across field caliper-verified Acadian forest plots.
- Species classification accuracy: 92.9% across primary northeastern conifers and hardwoods.
- Tree height accuracy: 92.4% using multi-scale perspective normalization.
- Closed-canopy DBH accuracy: 83.9% reported transparently alongside per-scan visibility flags and explicit ±% confidence intervals.

Operational Profile

- Inference latency: ~15 seconds per tree on containerized international cloud infrastructure.
- Cumulative throughput: 4.2M+ tree scans across single-stem smartphone and consumer RGB drone workflows.
- Unit economics: under $0.10 per tree in compute cost, enabling open single-tree browser access.

Benchmarking Approach

- Rooted Carbon pairs proprietary multi-scale optical geometry with ecological modeling benchmarked against Canadian Forest Service (CFS) standards and independent ground-truthed caliper trials in southeastern New Brunswick.
- Measurements provide scientific ecological baselines for stewardship, municipal inventories, and education.

© 2026 Rooted Carbon · Dieppe, New Brunswick