

Sampling with a Profiling LiDAR to Estimate Forest Resources

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ABSTRACT

Forest inventory estimates of volume and biomass and surface area estimates of asphalt/concrete, roof, and open water are generated from a single set of airborne laser profiling data acquired during the summer of 2000. County and state estimates of above-ground dry biomass, by land cover type, may be converted directly to estimates of standing carbon. A portable, inexpensive laser, which measures forest canopy height and canopy cover, is also used to identify and map mature forest stands which might support the Delmarva Fox Squirrel (*Sciurus niger cinereus*), an endangered species. Based on an analysis of 2539 km of flight data, merchantable volume estimates are within 27% of US Forest Service estimates at the county level and within 16% statewide. Total above-ground dry biomass estimates are within 22% of USFS estimates at the county level and within 19% statewide. Based on an analysis of 1304 km of flight data and associated videography, various types of impervious surface (roofs, concrete/asphalt) and open water are tallied along the flight lines to estimate percent and areal coverage statewide, by land cover and county. Laser estimates of impervious surface area are within 28% of satellite-based estimates at the county level and within 3.1% at the state level. Laser estimates of open water are within 7% of photointerpreted GIS estimates at the county level and within 3% of the GIS at the state level.