

# ESTIMATING FOREST VOLUME USING LIDAR DATA AND MULTISPECTRAL IMAGERY

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## Abstract

Estimating timber volume from a field perspective, with field plots occasionally falling within remote and inaccessible areas, can be a costly and timely endeavor. Remote sensing, with its ability to record information at both the local and regional scale, offers an alternative to traditional field based measurements. Studies have shown that vegetation biomass indices (e.g. NDVI) derived from mid-spatial resolution digital imagery (e.g. Landsat TM, 30 m), after being corrected for atmospheric effects, topographical differences and shadow, were highly correlated with timber volume. With the recent advent of high spatial resolution digital imagery from the IKONOS and QuickBird satellites providing more textural information about a forest canopy, with spatial resolutions of 4 m and 2.44 m respectively, the opportunity to assess forest volume from a distance has increased. LIDAR is a relatively new remote sensing technology that can accurately estimate the 3-dimensional structure of forest vegetation which is related to forest volume. This project analyzed the utility of using LIDAR data either as a stand alone commodity, or combined with current high resolution satellite imagery and existing vegetation indices, to ascertain the utility of estimating forest volume at Barksdale Air Force Base in Bossier City, Louisiana based on remotely sensed data in lieu of field plots.

[Abstract Only]

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