

ESTIMATING INDIVIDUAL TREE HEIGHTS IN LOBLOLLY PINE BIOMASS PLANTATION USING DRONE IMAGERY AND LIDAR-DERIVED MEASUREMENTS

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Height estimation from Unmanned Aerial Systems (UAS) is an ever-increasing interest in natural resource fields. With the use of PhoDAR from drone imagery in combination with LiDAR data, we produced high-resolution digital surface models over two test sites. After individual tree identification, we computed individual tree heights on a young biomass plantation of loblolly pine. PhoDAR derived heights were compared with field measurements. Of the 7,200 study trees, the software was able to detect 7,143 trees. Overall correlations between field measured heights and PhoDAR derived heights among sites was low (0.18). Site 1 had a very low correlation (-0.10), but Site 2 had a very strong correlation (0.79). The difference in correlation was attributed the “bowl effect” commonly noted in some digital elevation models from vertical UAS imagery (James and Robson, 2014). With proper ground control and techniques to mitigate such board-scale deformations, the use of PhoDAR derived measurement can become a more efficient method than traditional field methods.