

Canopy height estimation of secondary broadleaved forest using digital aerial photo images and airborne LiDAR data

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ABSTRACT: There are two methods of estimating canopy height from remote sensing data; stereo pair aerial photos and airborne LiDAR. In this study, canopy height estimation using airborne remotely sensed data was attempted at a secondary broadleaved forest. For creating digital canopy height model (DCHM), in this research, we examined three kinds of combination of digital surface model (DSM) and digital elevation model (DEM). Those combinations were a) both DSM and DEM from LiDAR, b) DSM from aerial photo and DEM from LiDAR, and c) DSM from aerial photo and DEM from public distributed data (Geospatial Information Authority of Japan). Three types of canopy height distribution maps were created, their accuracies were evaluated, and the usefulness of each method was discussed. Consequently, DCHM derived from LiDAR DSM and DEM indicated best accuracy. Next is one from aerial photo DSM and LiDAR DEM. Although it was an ideal to carry out LiDAR measurement each time, it was confirmed that the height information derived from digital aerial photo is also useful for secondary broadleaved forest monitoring.

KEY WORDS: Digital Canopy Height Model, Digital Surface Model, stereo pair digital aerial photo images, LiDAR, secondary broadleaved forest