Stratification of forests into diameter classes based on airborne LiDAR derived canopy height model and inventory data: A case study in Smolnícka Osada, Slovakia

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The airborne laser scanning (ALS) data and derivatives may offer an accurate and effective means of mapping forests. Here, we use ALS derived canopy height model (CHM) and inventory data for forest stratification into diameter classes, fundamentally important for uneven-aged forest management. The case study was conducted at the ProSilva demo site Smolnícka Osada (Eastern Slovakia, Central Europe). The CHM with a spatial resolution of 0.5 m and inventory data from 344 inventory plots distributed across the region were used. Six diameter classes (regeneration, coppice, pole wood, thin, medium, and thick stem wood) were distinguished with following diameter limits: 8, 12, 20, 32 and 52 cm. For these limits, height equivalents (acquired from CHM) were calculated using local two factorial height curves (derived from inventory data). The result is a map of uneven-aged forest displaying realistically spatial distribution of dominant diameter classes, for practical purposes coloured by same colours as quasi equivalent age classes in standard stand map. Along with a visual view, the map of diameter classes makes possible to estimate spatial distribution of standing timber volume, and finally also indicative harvest localisation.