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BIOMASS ESTIMATION OF INDIVIDUAL TREES USING STEM AND CROWN DIAMETER TLS MEASUREMENTS

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Abstract. The objective of this study was to make preliminary investigations between accurately measured field biomasses and terrestrial laser scanning (TLS) measurements including tree crown and stem diameters. Stem and crown biomass were determined based on detailed field measurements of the individual tree stem, bark, branch and needles. At the tree level, field measurements were intensive and thus material consisted of only 20 trees located at 11 stands.

Stem and crown diameters were extracted manually from TLS point clouds and used as predictors for total biomass. Correlations from 0.96 to 0.99 between predicted and field measured biomass estimates were obtained. Examination of stem form predictions showed that various diameters measured by TLS could enhance the tree level stem curve predictions. Results are rather promising, but more field data is needed for developing practical modelling means. Our further studies will concentrate on automation of TLS data processing and use the of TLS features in the biomass estimation.

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