

Supplementary material

Table S1: Mean difference \pm standard deviation between the ground scan winter and the ground scan summer for beech and spruce ($n=20$, respectively). The data are presented in absolute (abs.) and relative values (rel. in %). Listed are the single tree morphologies total tree height (tth), diameter at breast height (dbh), height of maximum crown projection area (hcpa), maximum crown projection area (cpa), crown volume (crvol) and crown surface area (csa). The p-value indicates whether the difference is significant between beech and spruce.

	Beech (abs.)	Beech (rel.)	Spruce (abs.)	Spruce (rel.)	p-value
tth (m)	-0.36 ± 0.70	-1.26 ± 2.46	$+0.18 \pm 0.51$	$+0.54 \pm 1.55$	0.005
dbh (m)	$+0.01 \pm 0.01$	$+3.08 \pm 4.00$	$+0 \pm 0.01$	$+1.40 \pm 2.44$	0.228
hcpa (m)	-0.65 ± 4.41	-3.06 ± 20.92	$+0.91 \pm 2.70$	$+3.80 \pm 11.27$	0.330
cpa (m ²)	-1.03 ± 9.55	-3.76 ± 35.02	$+1.4 \pm 1.28$	$+8.53 \pm 7.84$	0.718
crvol (m ³)	$+15.03 \pm 155.28$	$+3.74 \pm 38.68$	$+27.02 \pm 24.71$	$+7.80 \pm 7.13$	0.799
csa (m ²)	$+15.02 \pm 76.88$	$+4.76 \pm 24.33$	$+14.91 \pm 14.94$	$+4.38 \pm 4.39$	0.904

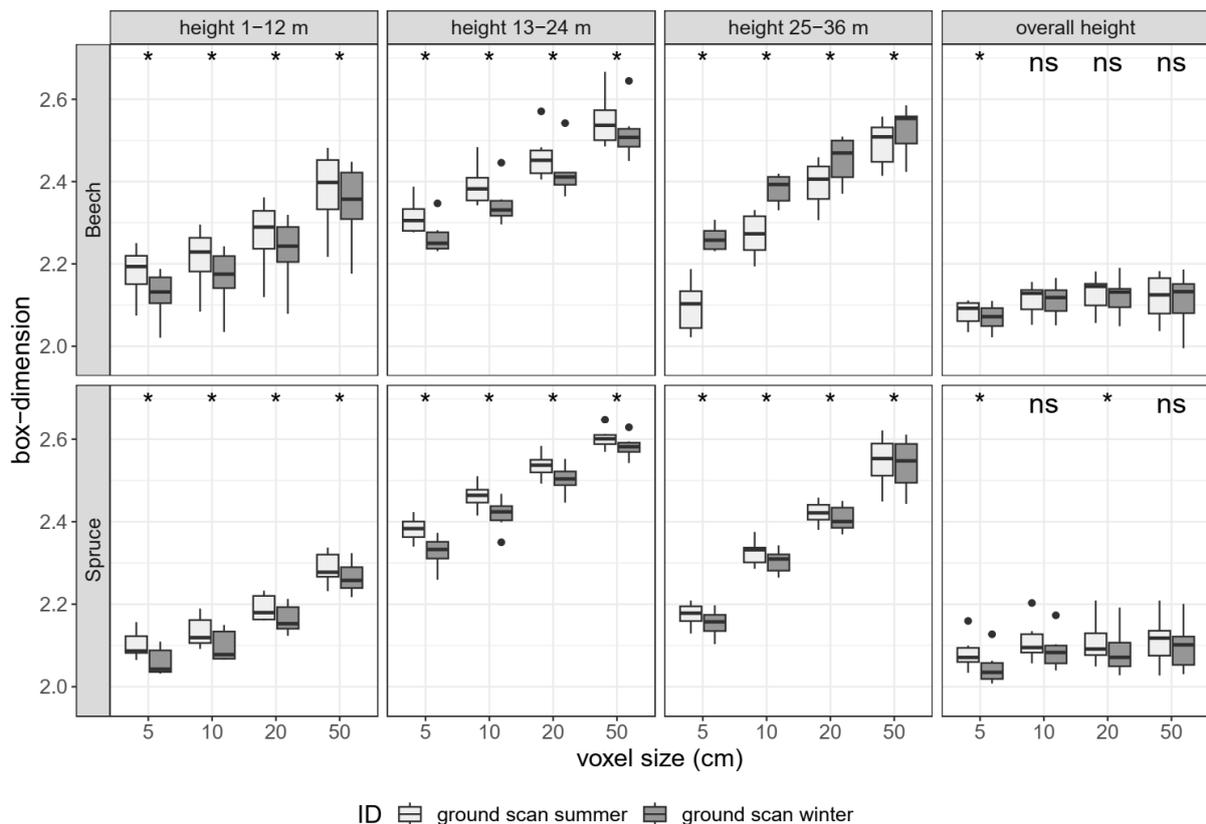


Figure S1: Seasonal comparison of different point cloud sections for the beech and spruce stands across the winter and summer ground scans depending on different spatial resolutions. The boxplots are based on six circular subplots with a radius of 5 m respectively. Shown are the box-dimensions for the point cloud sections of 1-12 m, 13-24 m, 25-36 m and the total point cloud. Asterisks indicate significant differences between the scans (*: $p \leq 0.05$; ns: $p > 0.05$).

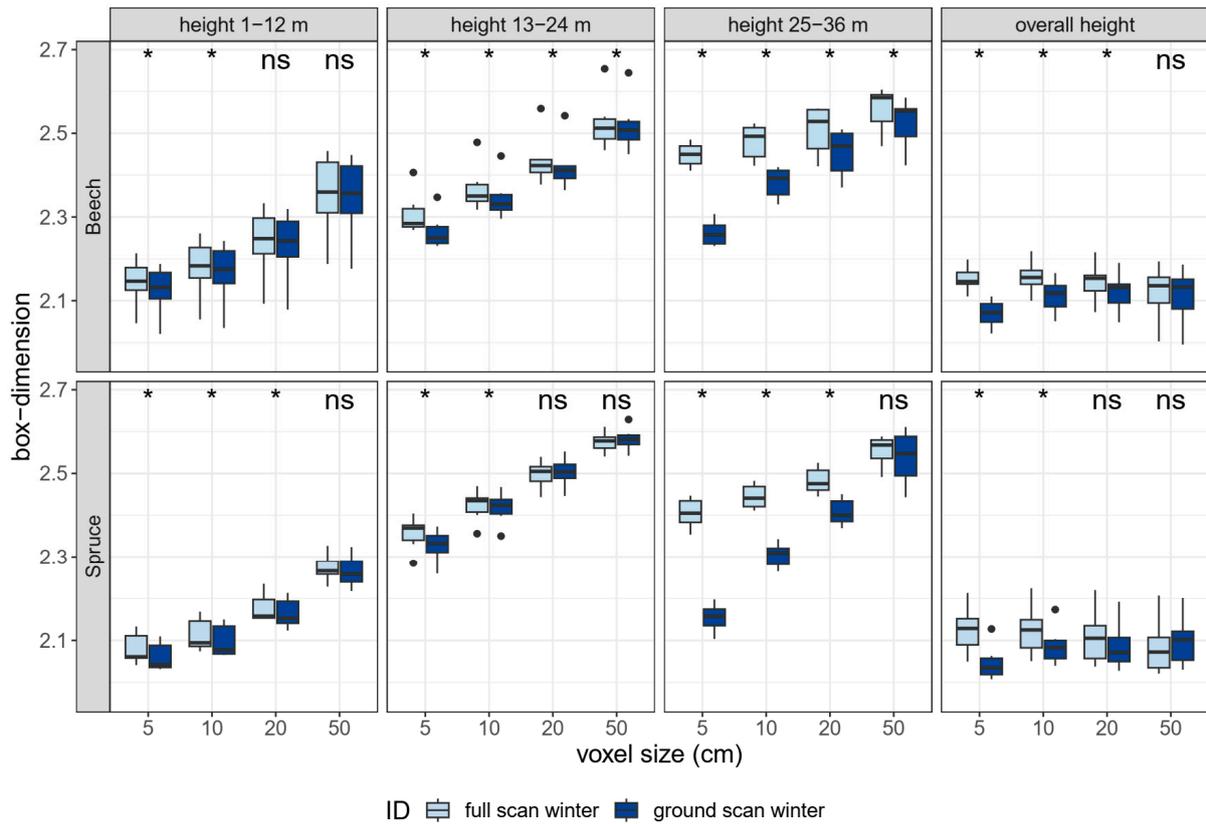


Figure S2: Methodological comparison of different point cloud sections for the beech and spruce stands between the ground scans and the full scans conducted in winter depending on different spatial resolutions. The boxplots are based on six circular subplots with a radius of 5 m respectively. Shown are the box-dimensions for the point cloud sections of 1-12 m, 13-24 m, 25-36 m and the total point cloud. Asterisks indicate significant differences between the scans (*: $p \leq 0.05$; ns: $p > 0.05$).