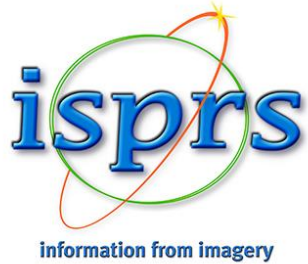


SFM-Forest-Benchmark project: The benchmarking of image-based point cloud for forest inventory



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International Benchmarking of terrestrial Image-based Point Clouds for Forestry

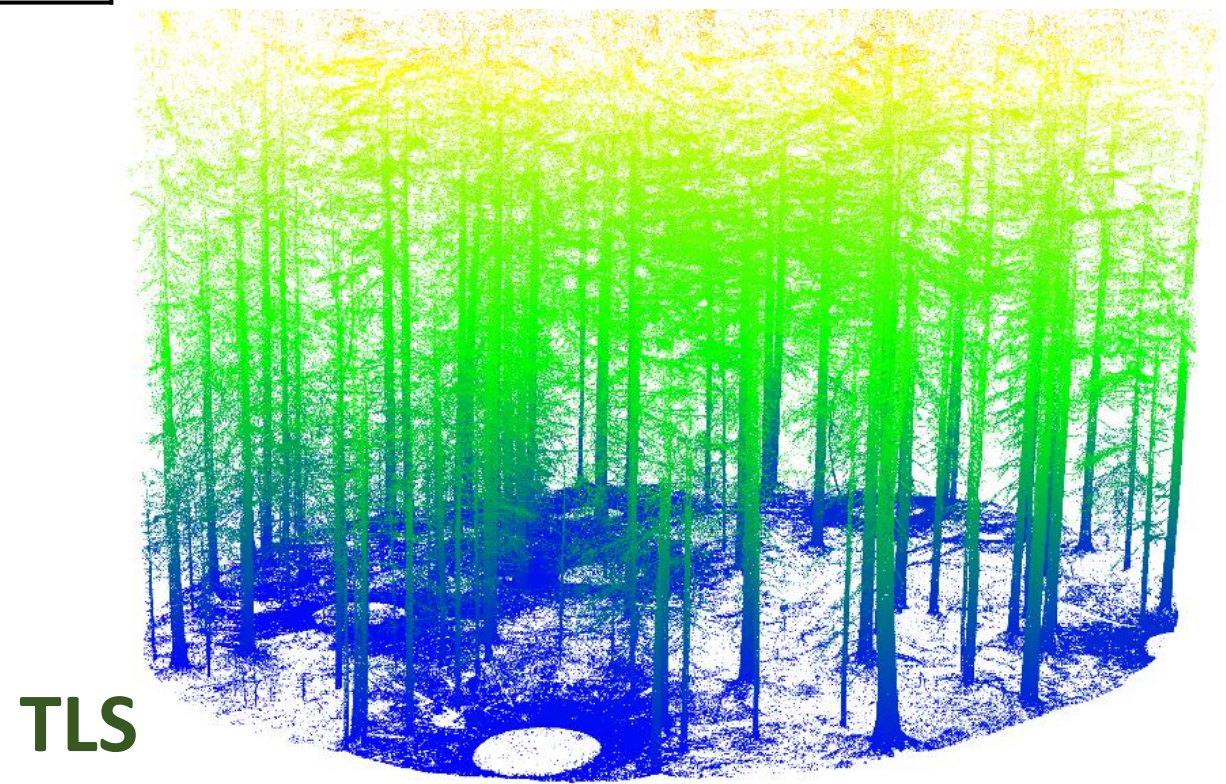
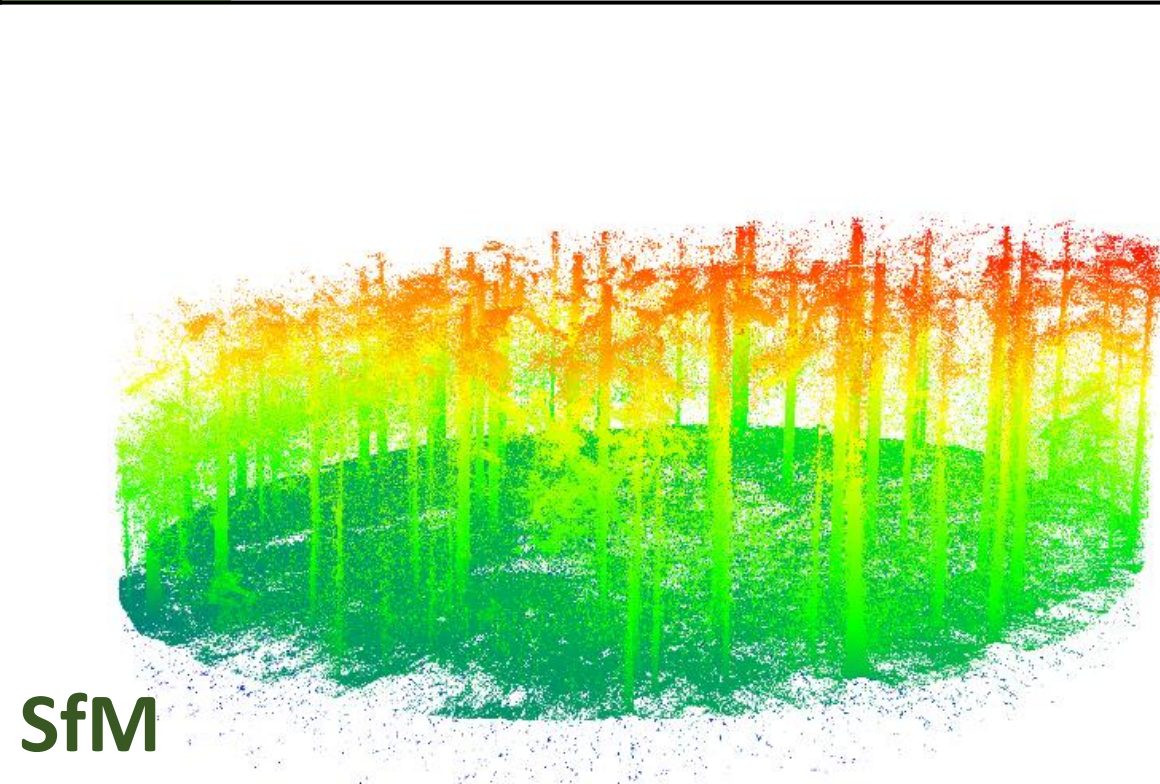
ISPRS Scientific Initiatives 2019

Project hypothesis

- Is it possible to use image-based point clouds for individual tree mapping and modelling in various type of forest stands ?
- Is it possible to achieve similar accuracy from image-based point clouds as from TLS point clouds regarding DBH estimation within the research plots?
- Will applied algorithms for DBH and tree positions estimation show different performance on image- and TLS-based point clouds?
- What is influencing the accuracy of the tree mapping and modelling in algorithms?

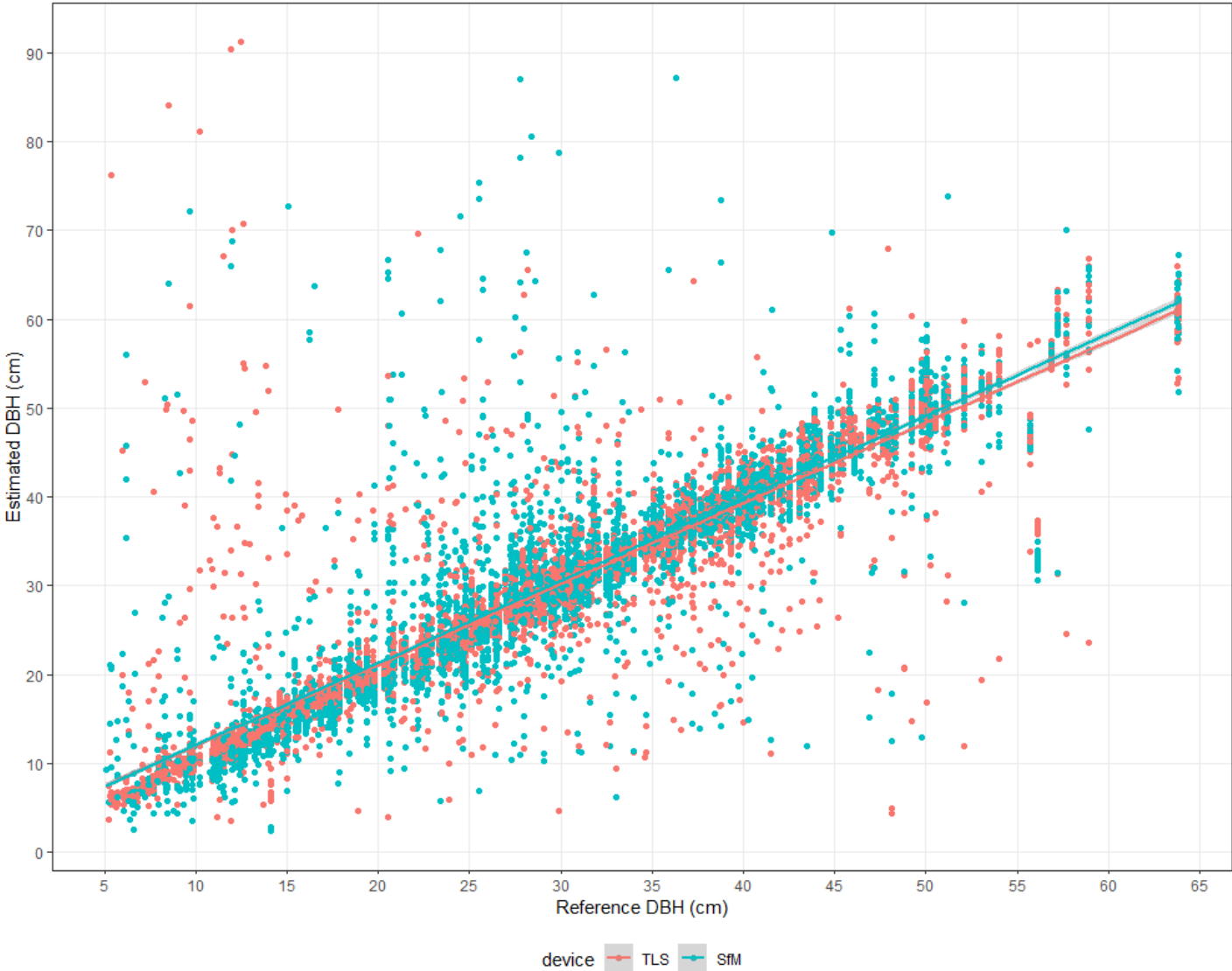
Study site	Shape	Size (m)	Tree species	Stem
		Diameter / square length		Density [stems/ha]
Austria 1	Circular	40	Picea abies	533
Austria 2	Circular	40	Fagus sylvatica	390
China 1	Circular	30	Taxodium distichum	410
China 2	Circular	30	Liriodendron chinensis	609
Czechia 1	Square	50	Fagus sylvatica	280
Czechia 2	Square	50	Picea abies	272
Finland 1	Square	32	Pinus sylvestris	479
Finland 2	Square	32	Pinus sylvestris, Betula sp.	869
Slovakia 1	Circular	20	Abies alba	875
Slovakia 2	Circular	15	Quercus petraea	651

DATASETS



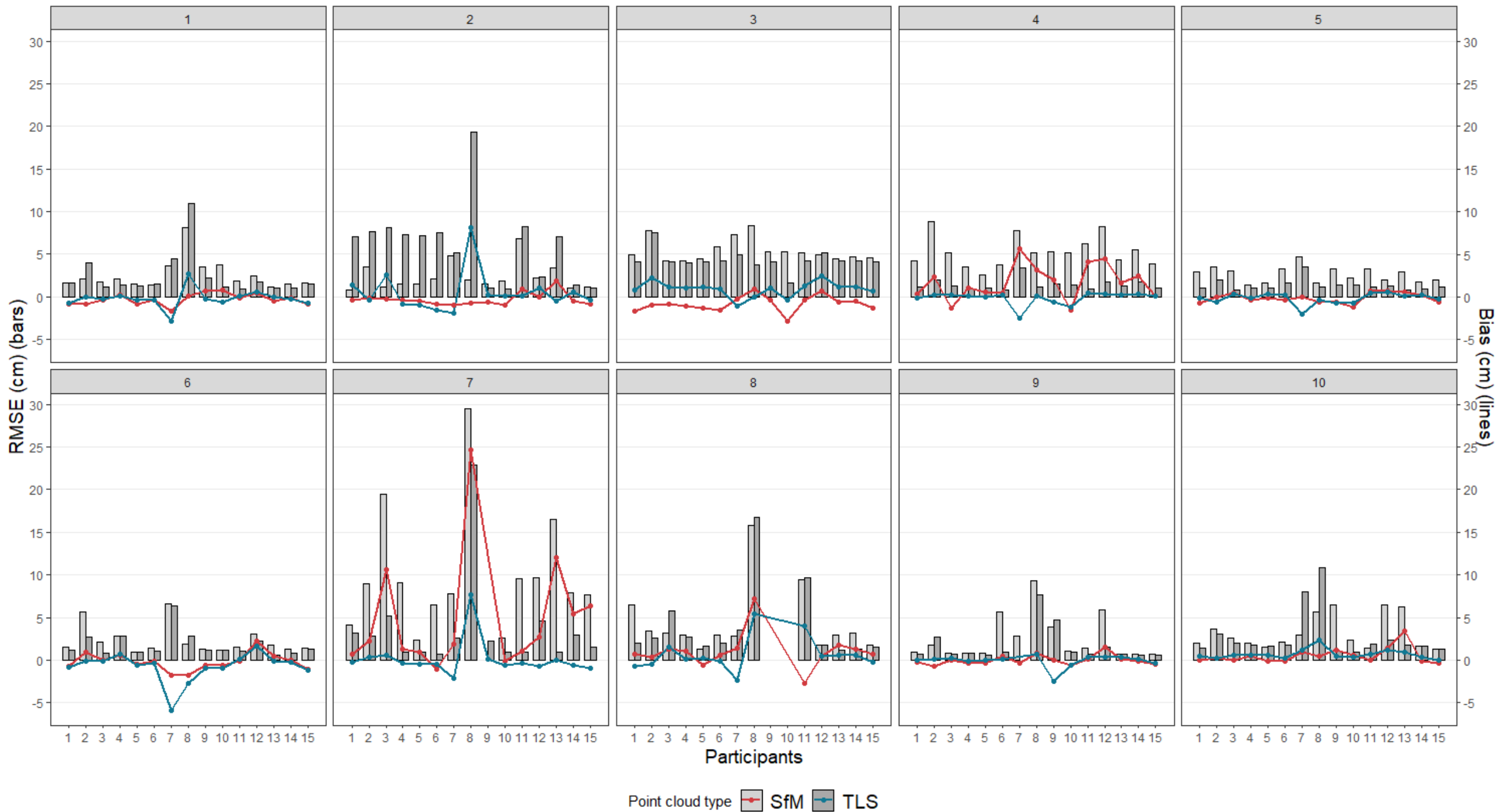
Institution	Responsible person
The Silva Tarouca Research Institute for Landscape and Ornamental Gardening	Martin Krůček
Aalto University	Di Wang
Chinese Academy of Sciences	Jinhu Wang
Czech University of Life Sciences Prague	Karel Kuželka
Finnish Geospatial Research Institute	Xinlian Liang
Forest Research Institute	Grzegorz Krok
Forest Research Institute	Bartłomiej Kraszewski
Harran University	Nizar Polat
NASA Goddard Space Flight Center	Atticus Stovall
Nanjing Forestry University	Lin Cao
Nanjing Forestry University	Lin Cao
Technical University of Vienna	Markus Hollaus
Technical University in Zvolen	Milan Koreň
University of Oviedo	Carlos Cabo
University of Sopron	Gábor Brolly

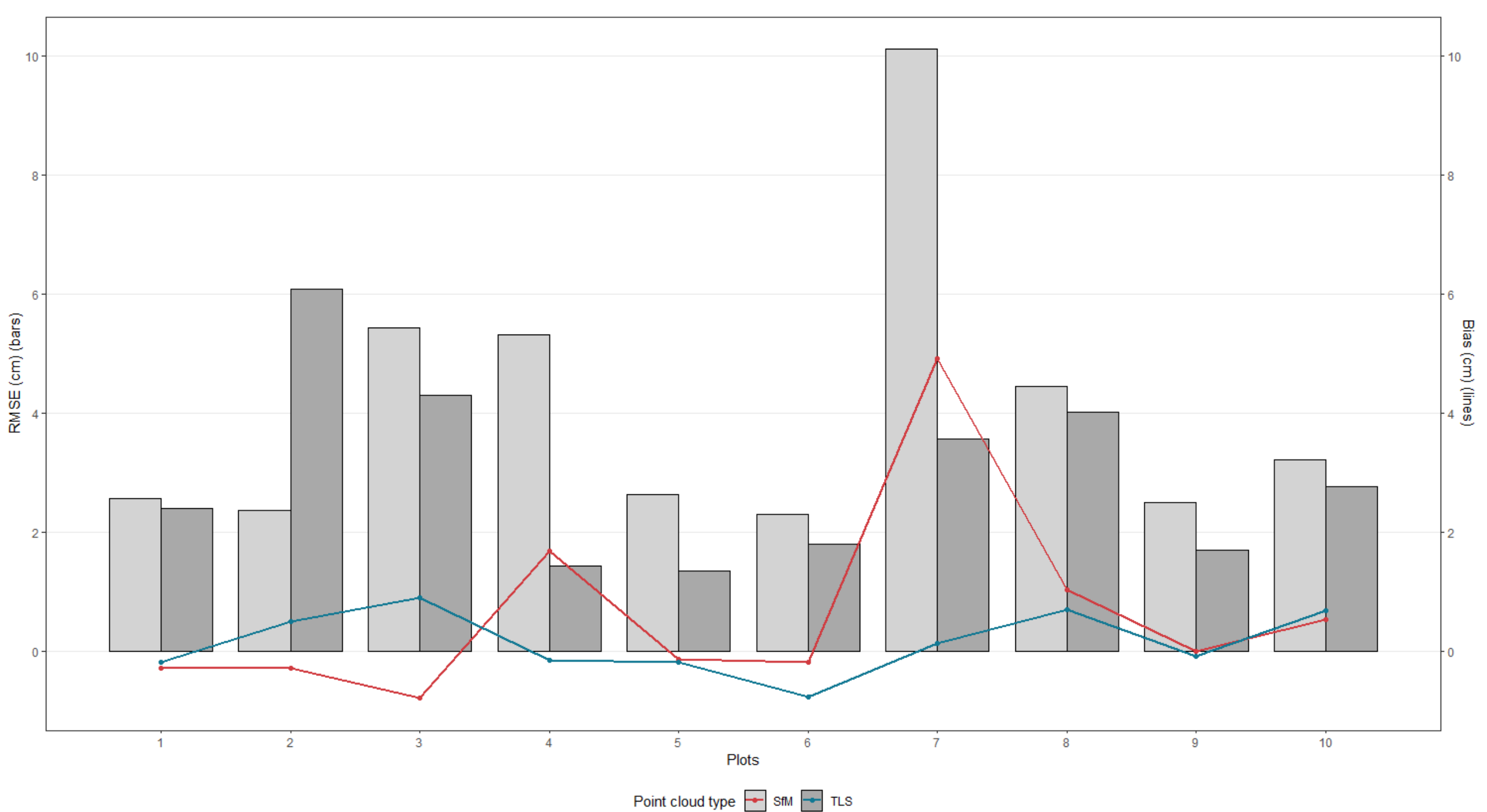
12,000+ individual results



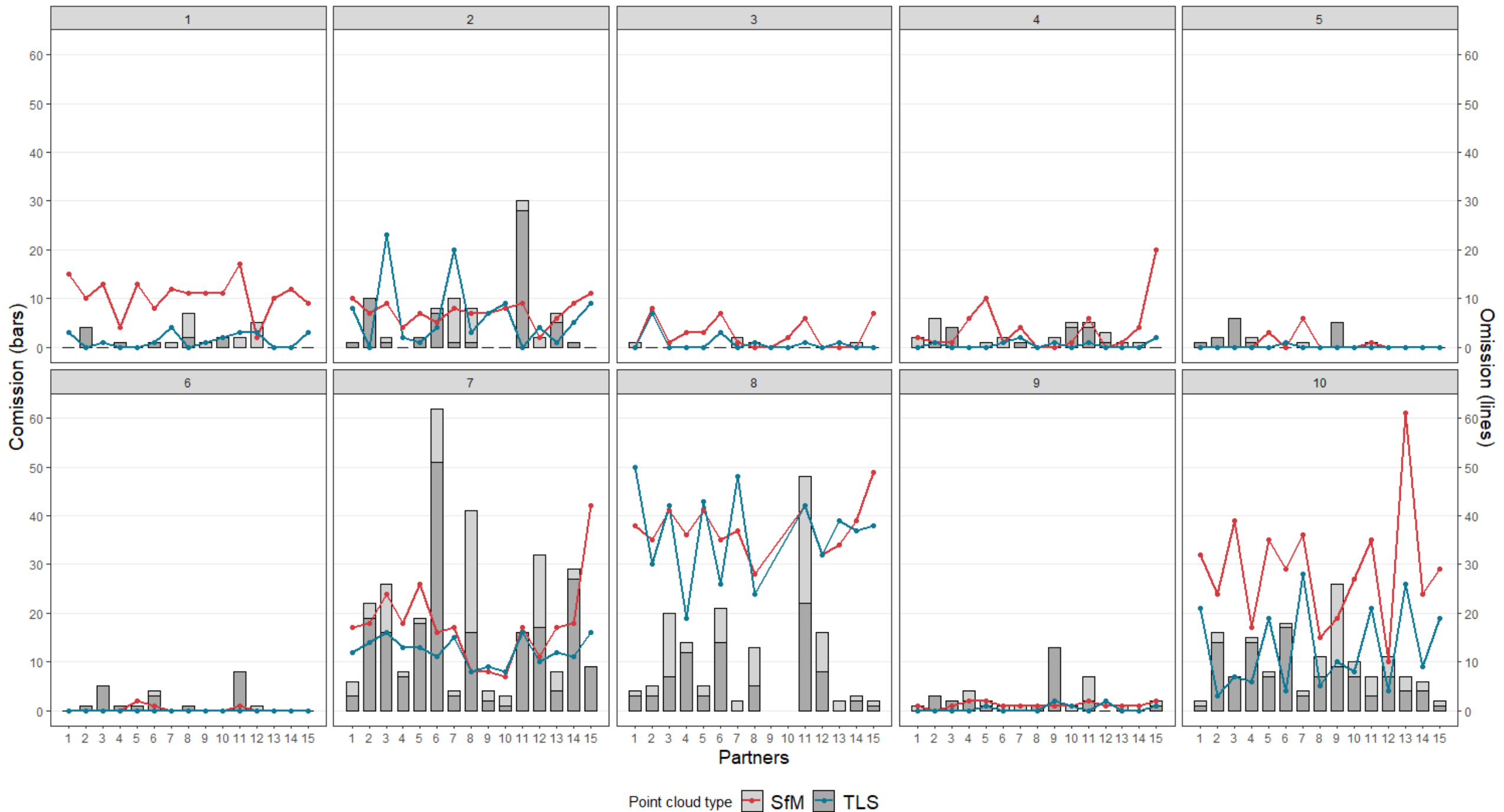
RMSE

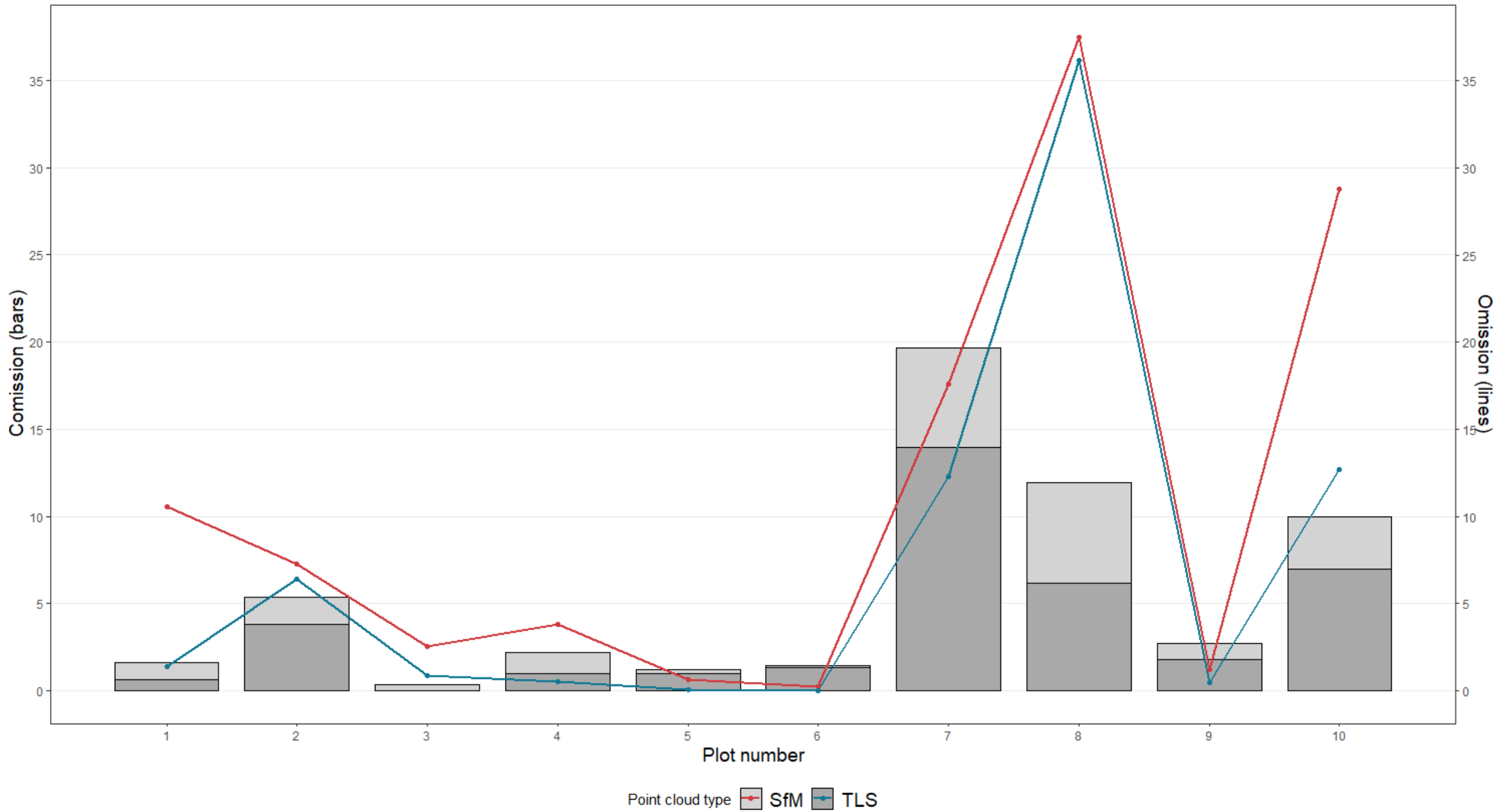
Bias



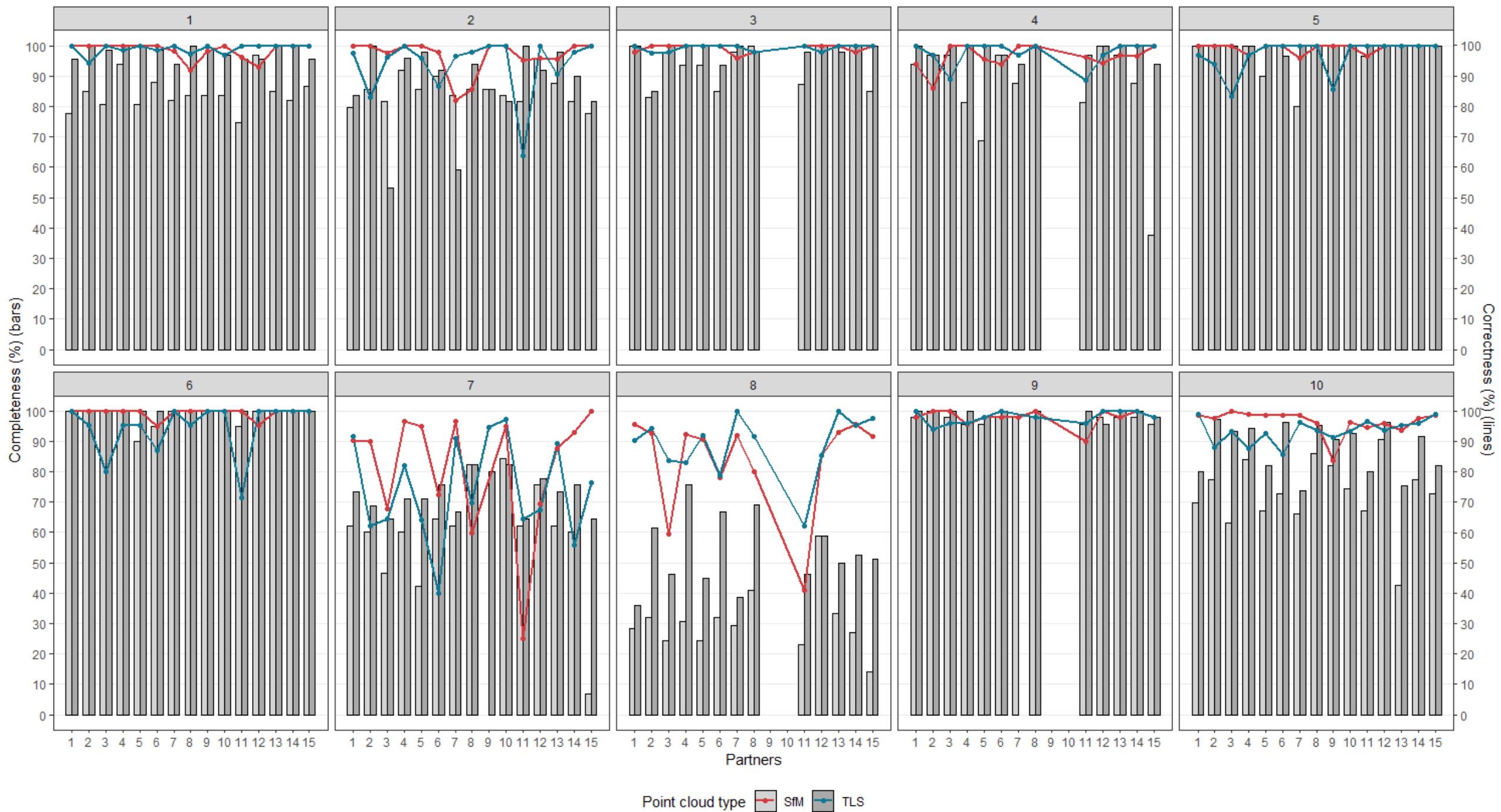


Omission
Commission





Completeness
Correctness



Preliminary conclusions

- It is possible to use image-based point clouds for individual tree mapping and modeling in various type of forest stands,
- it is possible to achieve similar accuracy from image-based point clouds as from TLS point clouds regarding DBH estimation within the research plots,
- applied algorithms for DBH estimation showed significant differences

Thank you for your attention

