

Lowland forest road cross section survey using UAV

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DOKTORATA
BIOTEHNIČKOG
PODRUČJA

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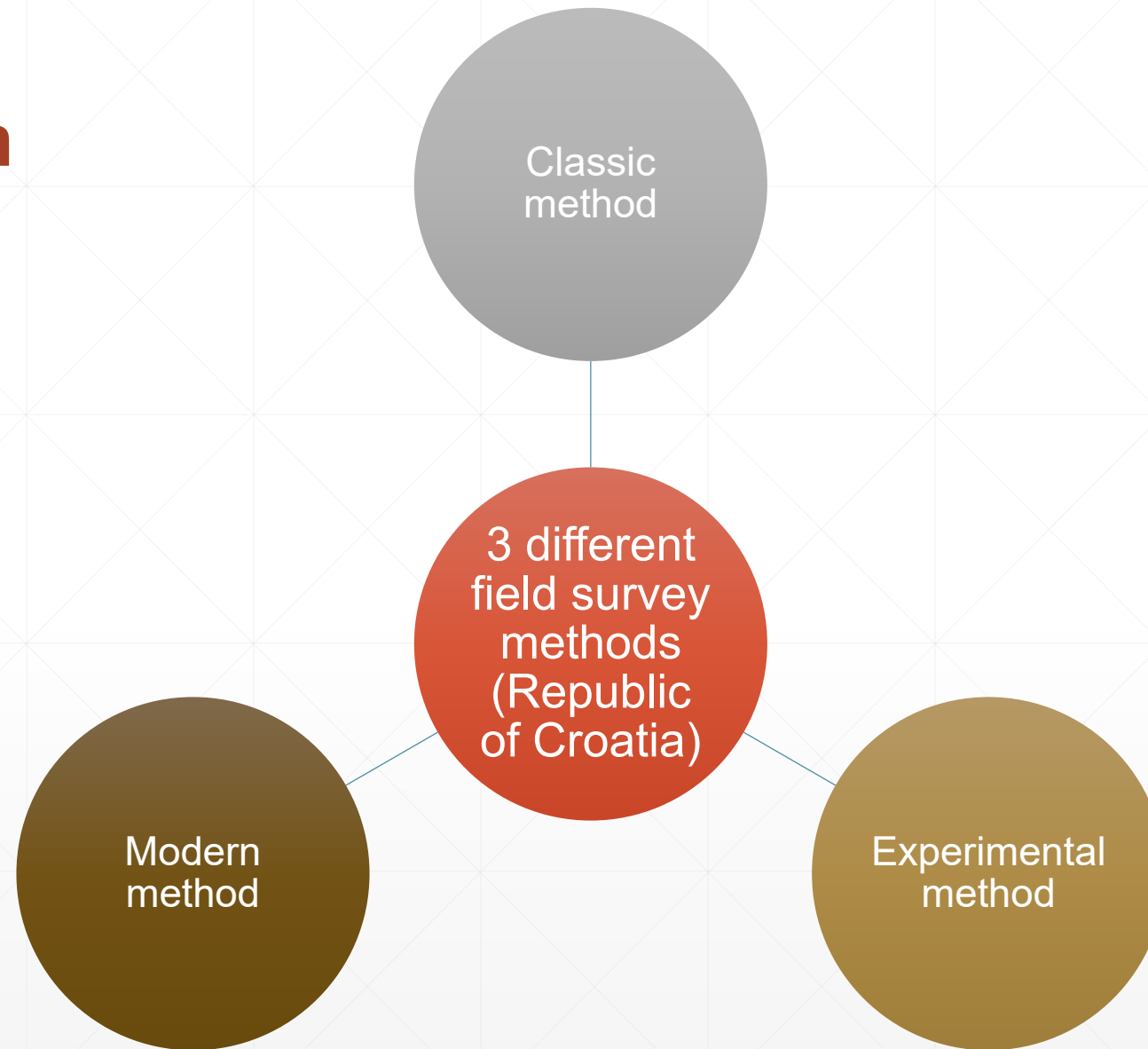
Lowland forest road cross section survey using UAV

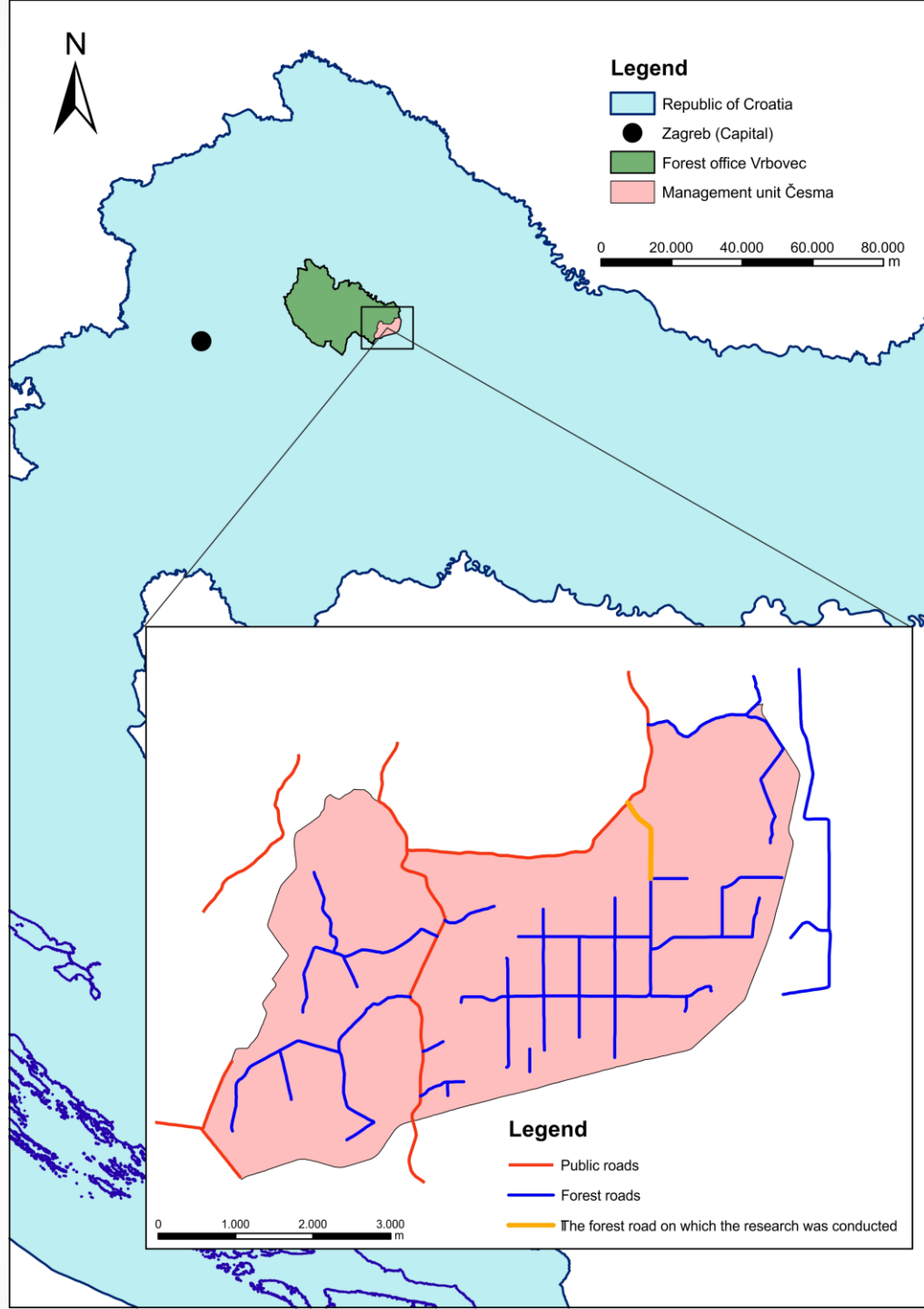
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Introduction





Materials and Methods

Management unit Česma

Lowland forest – water, vegetation

Cross section survey

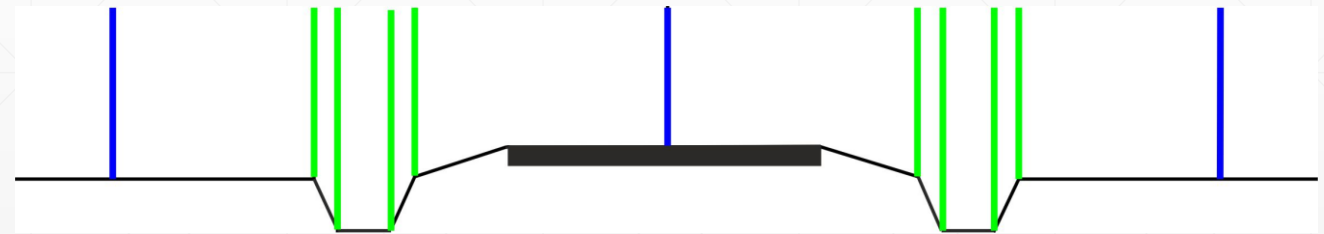
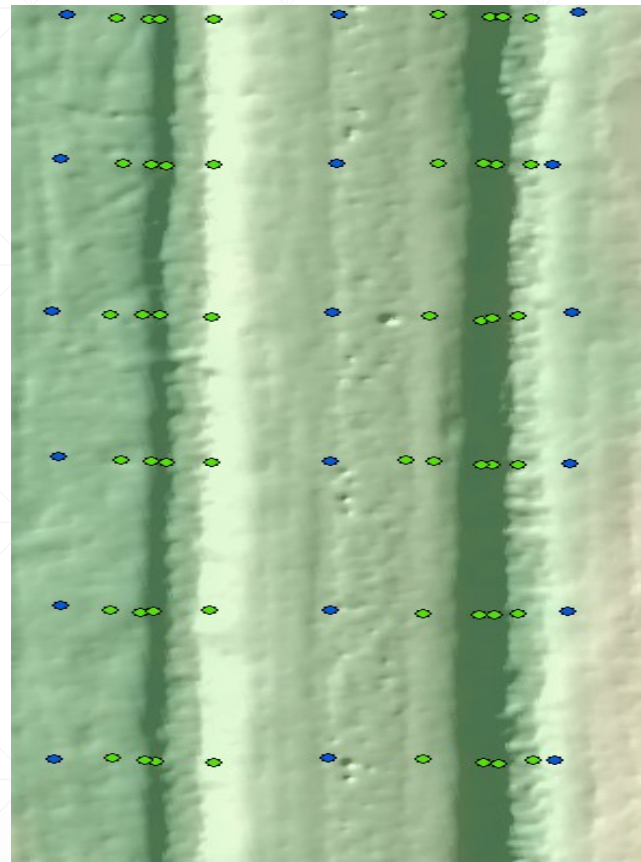
Forest road – total length of 910 m

Total station (reference method)

UAV

Materials and Methods

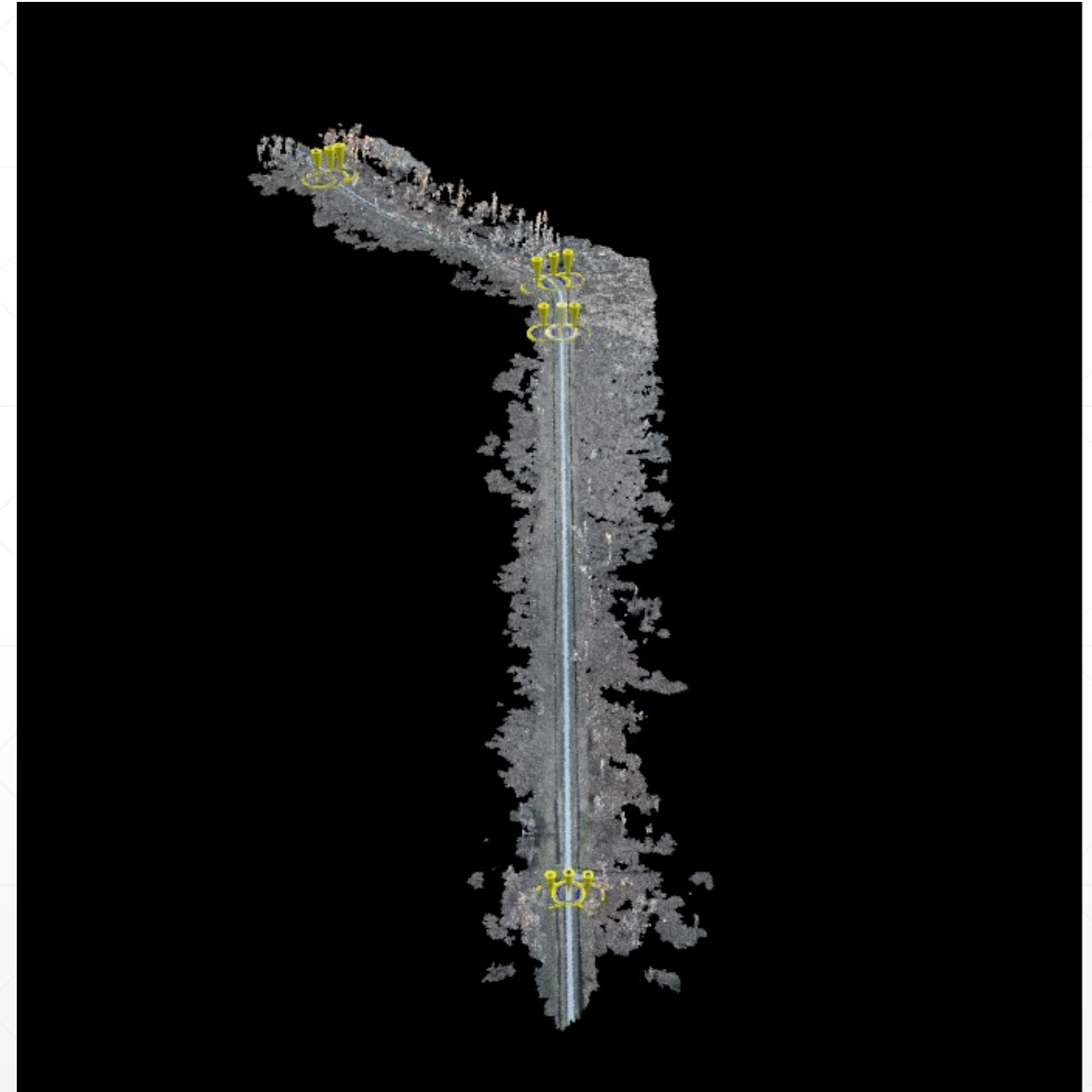
- Total station – Stonex R35
- 276 validation points (blue)
- 832 field survey points (green)
- 2 total station survey positions



Materials and Methods

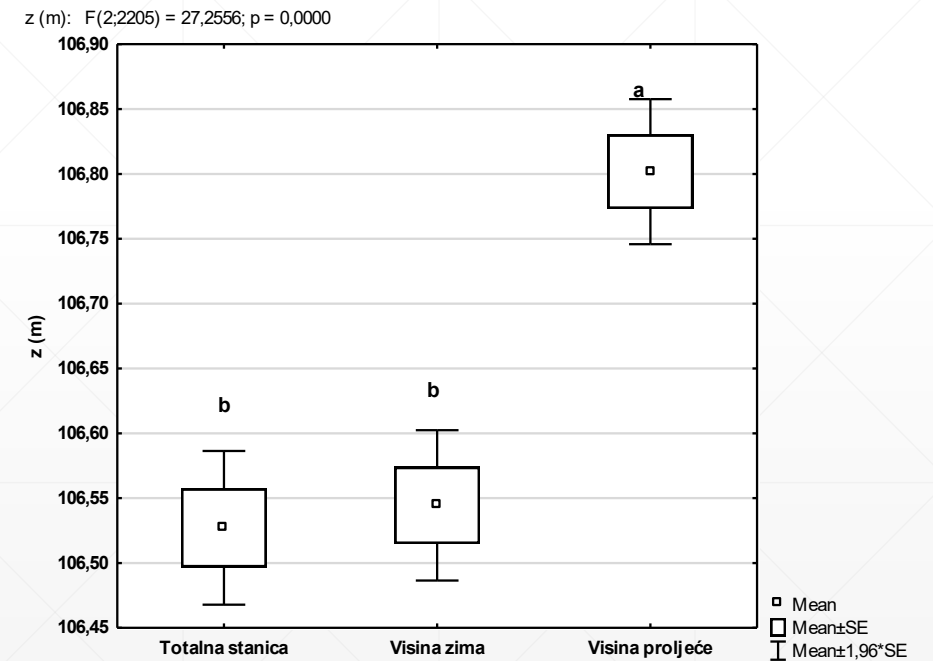
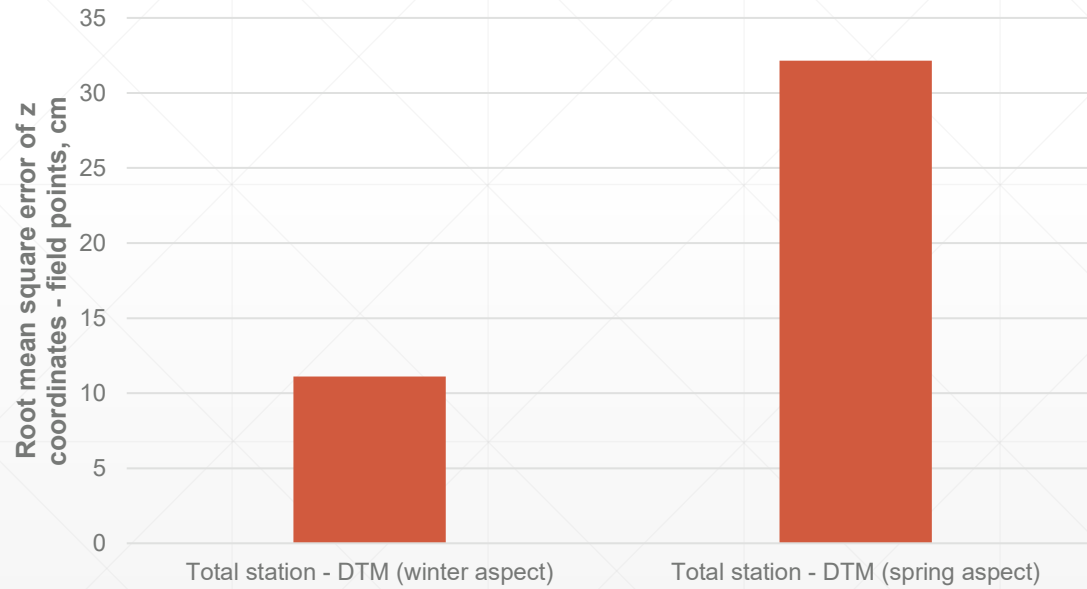
- DJI Mavic enterprise 3 with RTK module
- Winter and spring survey
- Missions hight 60 m, terrain follow
- 80% front and side overlap
- 12 Ground Control Points (yellow)
- Pix4d mapper (v. 4.8.4.)
- Automatic point cloud classification
- Z coordinate – ArcMap 10.8

Winter survey	Spring survey
687 photographs	687 photographs
19:35 min	18:34 min
16.18 ha	14 ha
GSD 1,76 cm [cm/pixel])	GSD 1,78 [cm/pixel])



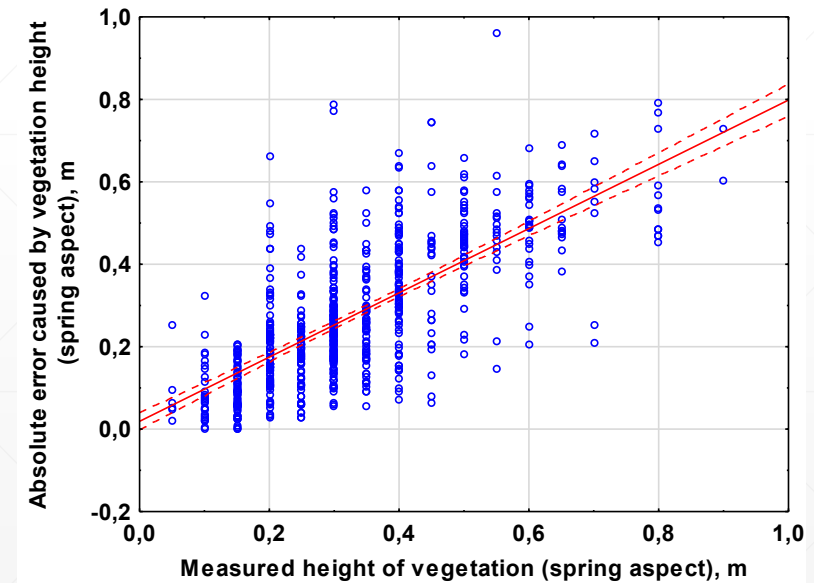
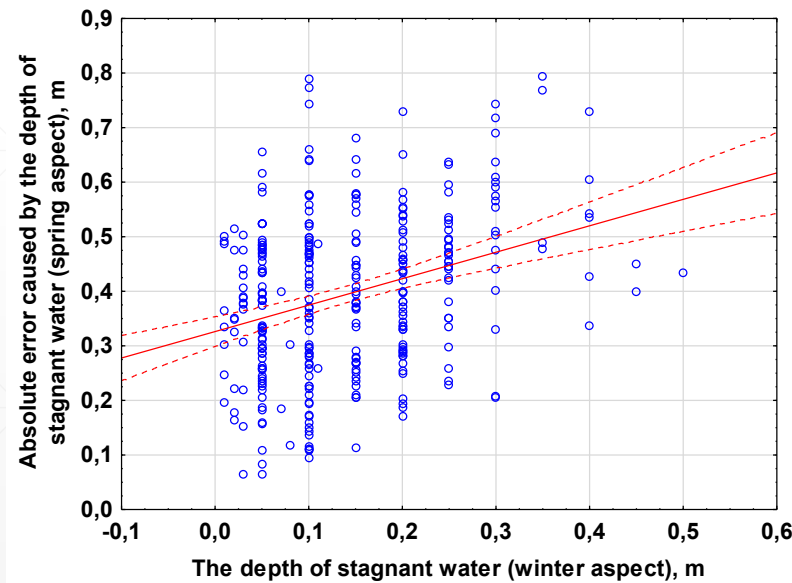
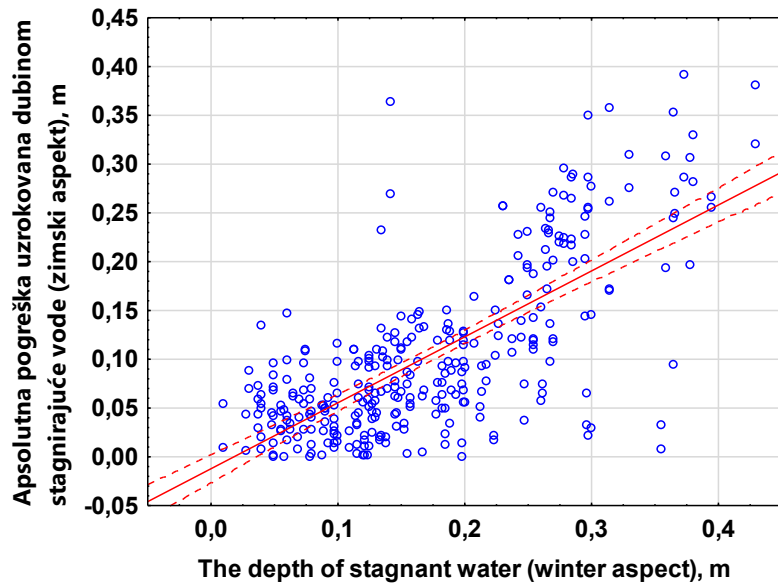
Results

- Higher RMSE values - spring measurement
- ANOVA - Two groups
- Vegetation? Water?



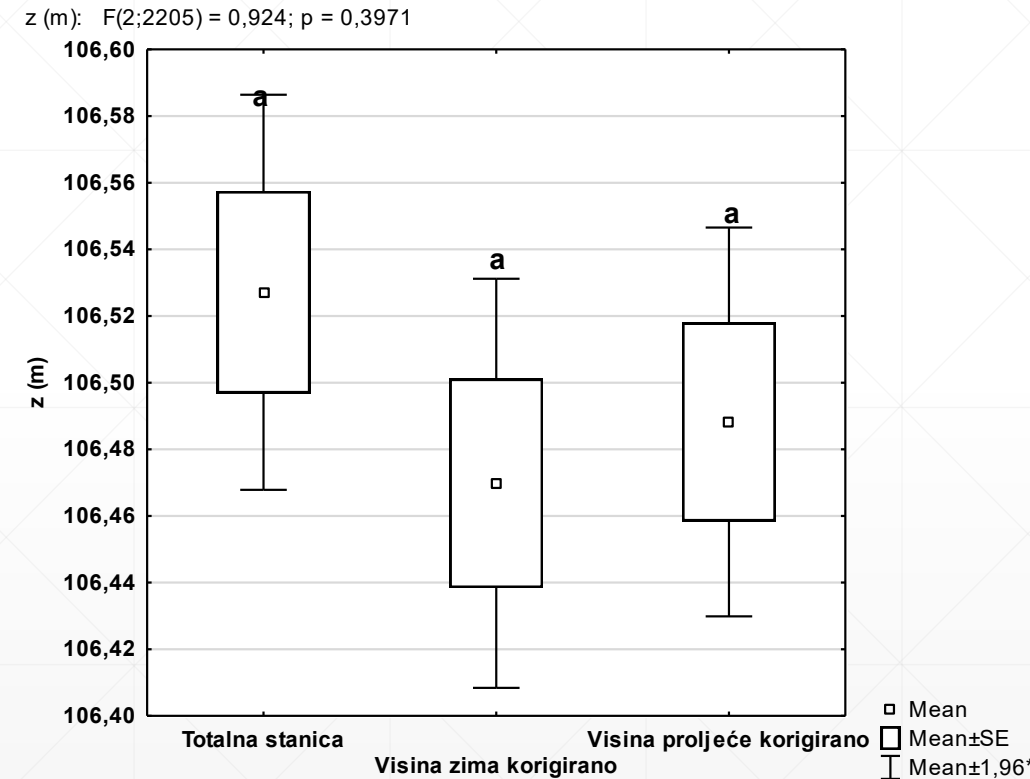
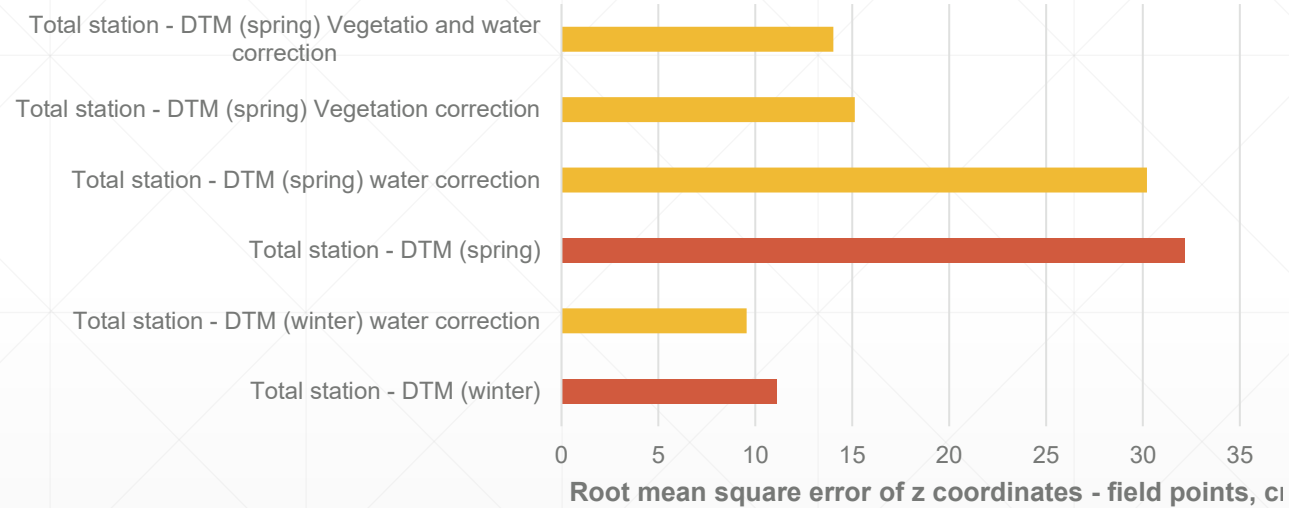
Results

- 81 (winter) and 87 (spring) profiles with water
- Average vegetation height - 0,32 m
- Winter DTM error and water depth – high and positive correlation coefficient
- Spring DTM error and vegetation height – high and positive correlation coefficient



Results

- No statistically significant difference
- Correction – when i where?



Conclusions

Great influence of water depth and vegetation height on the accuracy of the Z coordinate of the DTM

Data correction is not always the answer

Vegetation density?



Thank you for your attention!

