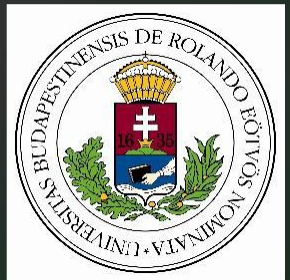
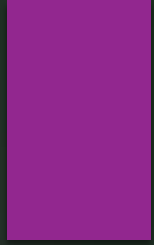




Soil organic carbon content predicting based on PRISMA hyperspectral satellite imagery and synthetized LUCAS SOIL spectral data

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Introduction



- ▶ **Institute for Soil Sciences, Centre for Agricultural Research**
Department of Soil Mapping and Environmental Informatics
- ▶ **PhD : ELTE Doctoral School of Environmental Sciences**
- ▶ **Mapping of surface and near-surface soil characteristics by machine and deep learning methods based on the spectral characteristics of soils**

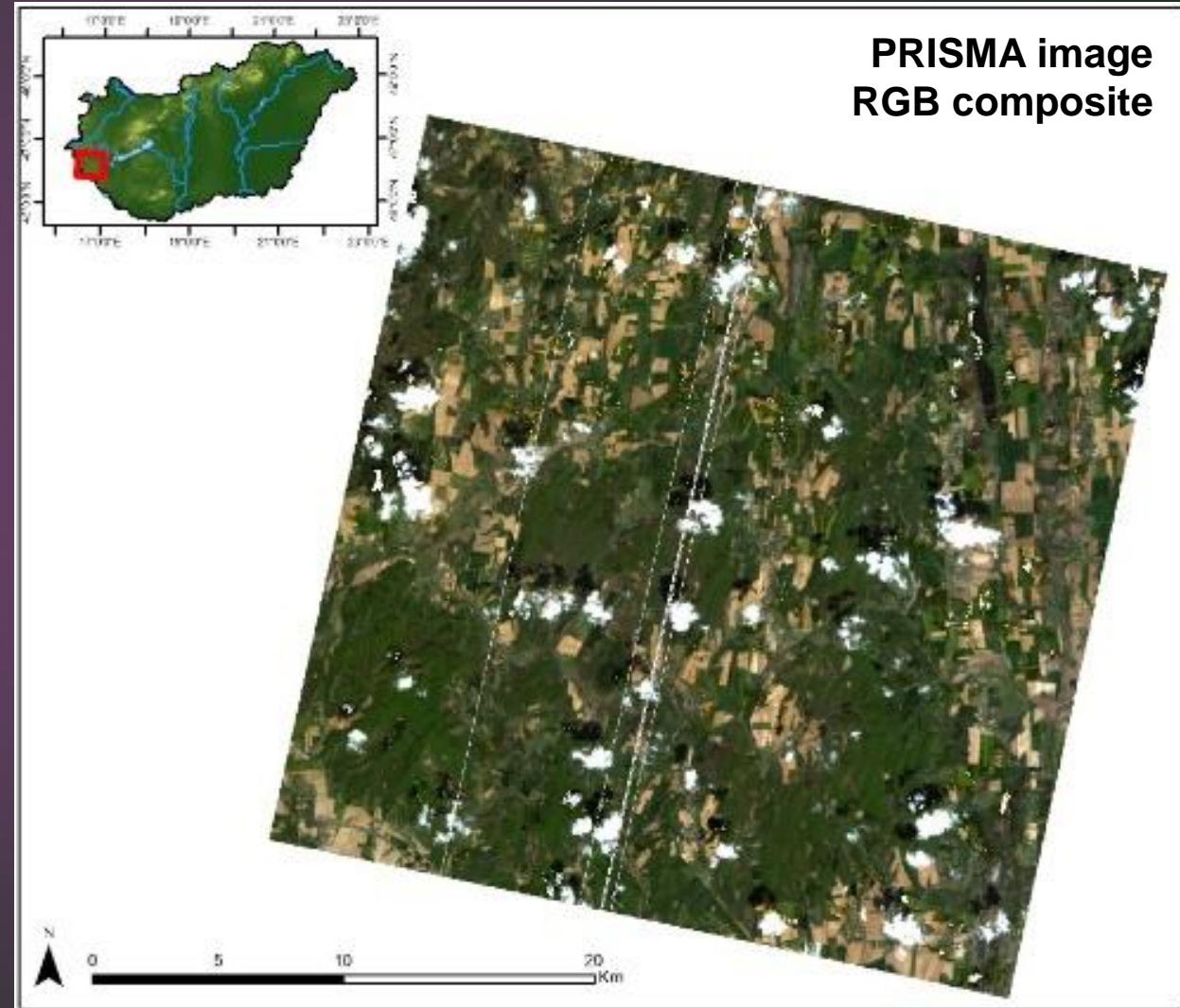
Introduction and Goals

- ▶ Estimation of the SOC content of a national sample area using generated models and PRISMA images
- ▶ Conversion of LUCAS spectral data according to PRISMA specification
- ▶ Building machine learning based models (Random Forest, Artificial Neural Network) for SOC estimation
- ▶ the SOC prediction accuracy of PRISMA (PRekursore IperSpettrale della Missione Applicativa - Hyperspectral Precursor of the Application Mission) satellite hyperspectral imagery data supplemented by various environmental datasets as additional predictor variables in four scenarios:

Material and methods

Study area

- ▶ Image acquisition: 23-04-2021
- ▶ Spectral bands (VNIR 400-1010 nm; SWIR 920-2505 nm) filtered leaving out atmospheric absorption wavelengths or bands with too much striping error:
 - ▶ 400-475 nm
 - ▶ 905-1010 nm
 - ▶ 1095-1160 nm
 - ▶ 1320-1490 nm
 - ▶ 1780-2030 nm
 - ▶ 2300-2505 nm
- ▶ Spatial resolution: 30 m

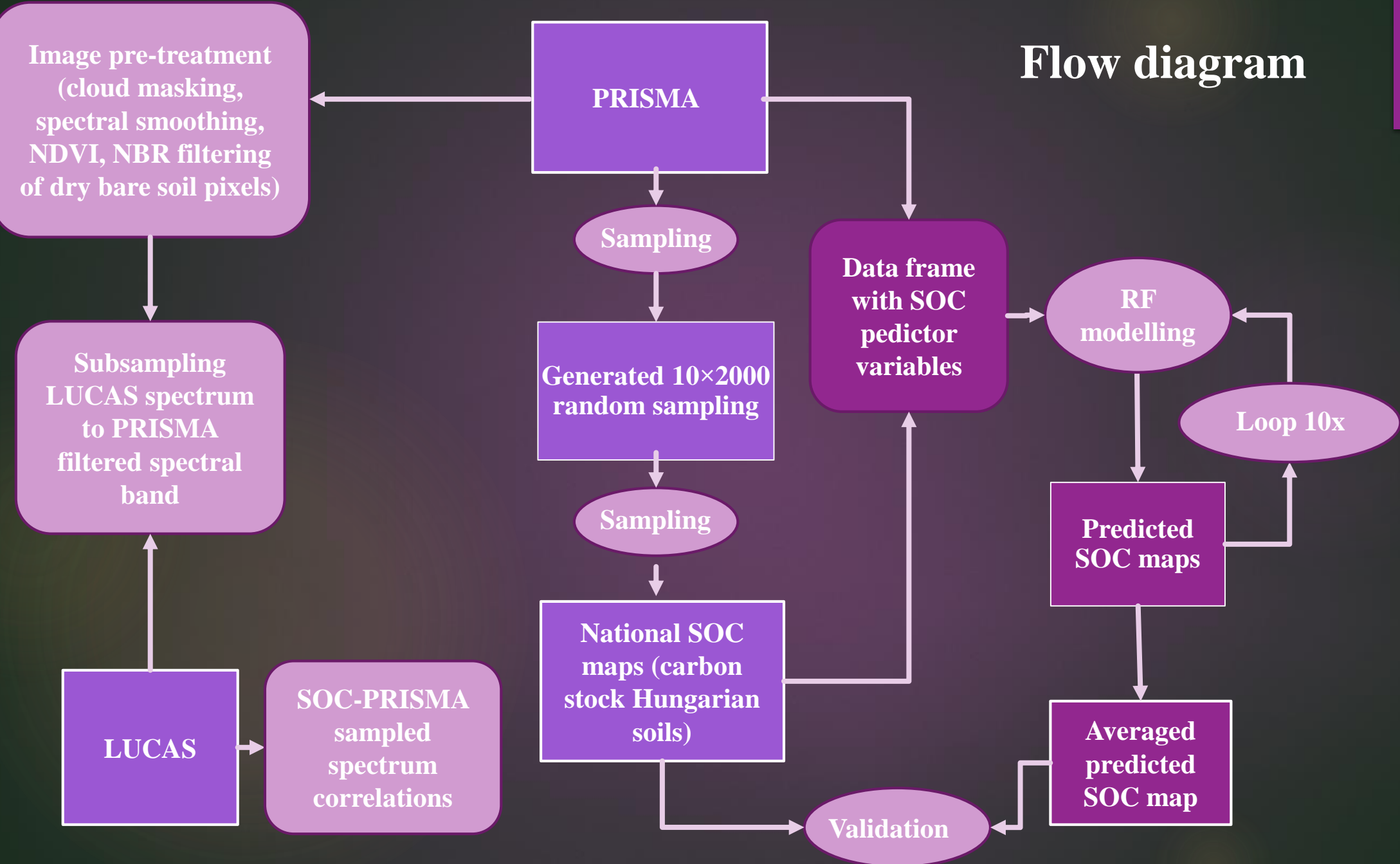


Material and methods

LUCAS spectral data resampled for PRISMA spectral bands (without atmospheric absorption bands)

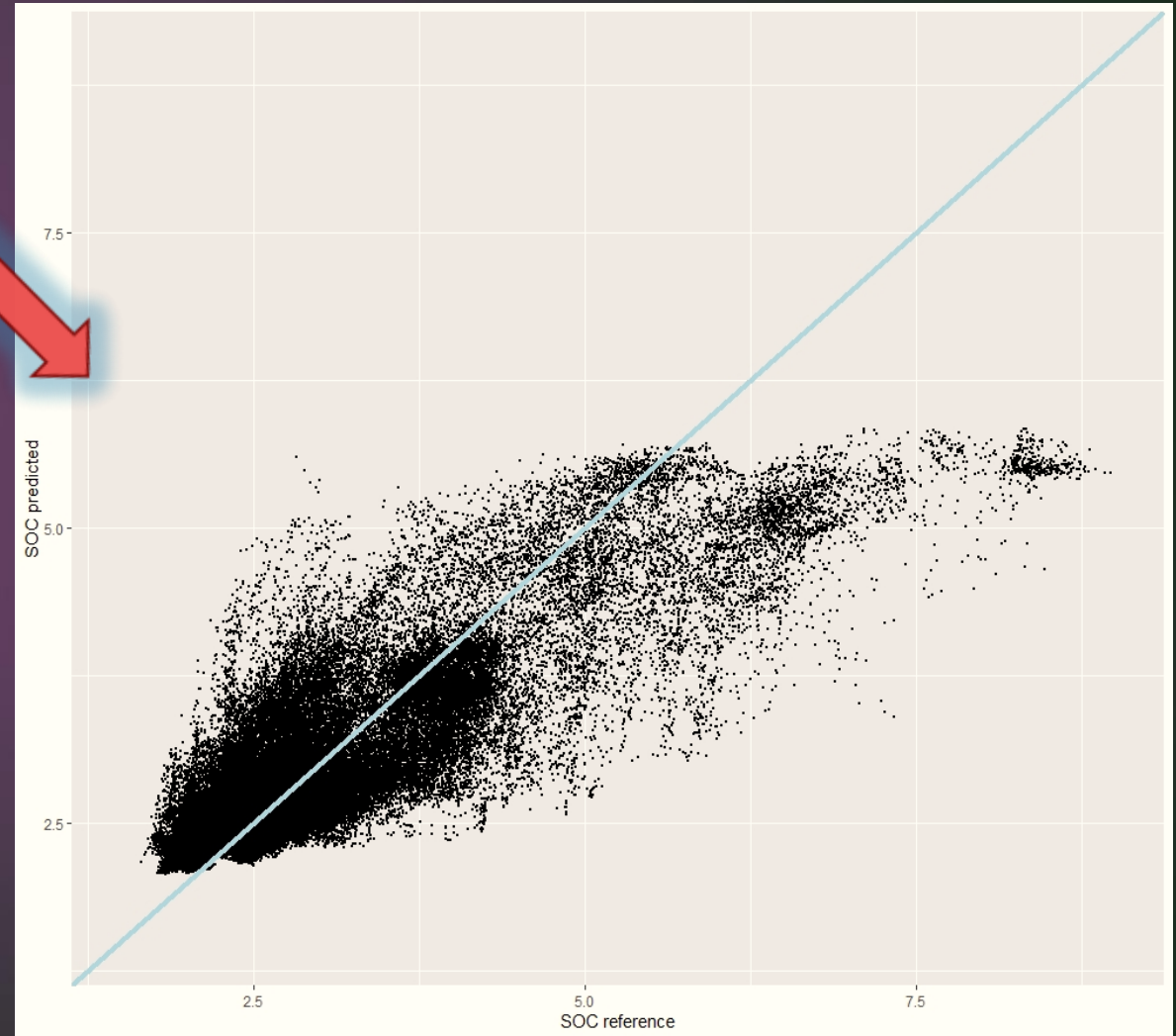
Pearson correlation	Wavelength range (nm)	References
-0,81	590-664 nm	Ben-dor et al. 1997.; Castaldi et al. 2019; Rossel et al. 2010
-0,88	900-1200 nm	Rossel et al. 2010
-0,85	2100-2300 nm	Ben-dor et al. 1997,2009; Biney et al. 2020

Flow diagram



Results and Conclusion

Datatype	MEAN	MIN	MAX	SD	R ²
Spectrum	-0,006	-2,866	5,549	0,785	0,588
Spectrum+ Indices	-0,028	-2,990	5,448	0,783	0,586
Spectrum+ Indices + DEM	-0,011	-2,783	3,937	0,495	0,869





Thank you for your kind attention

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