



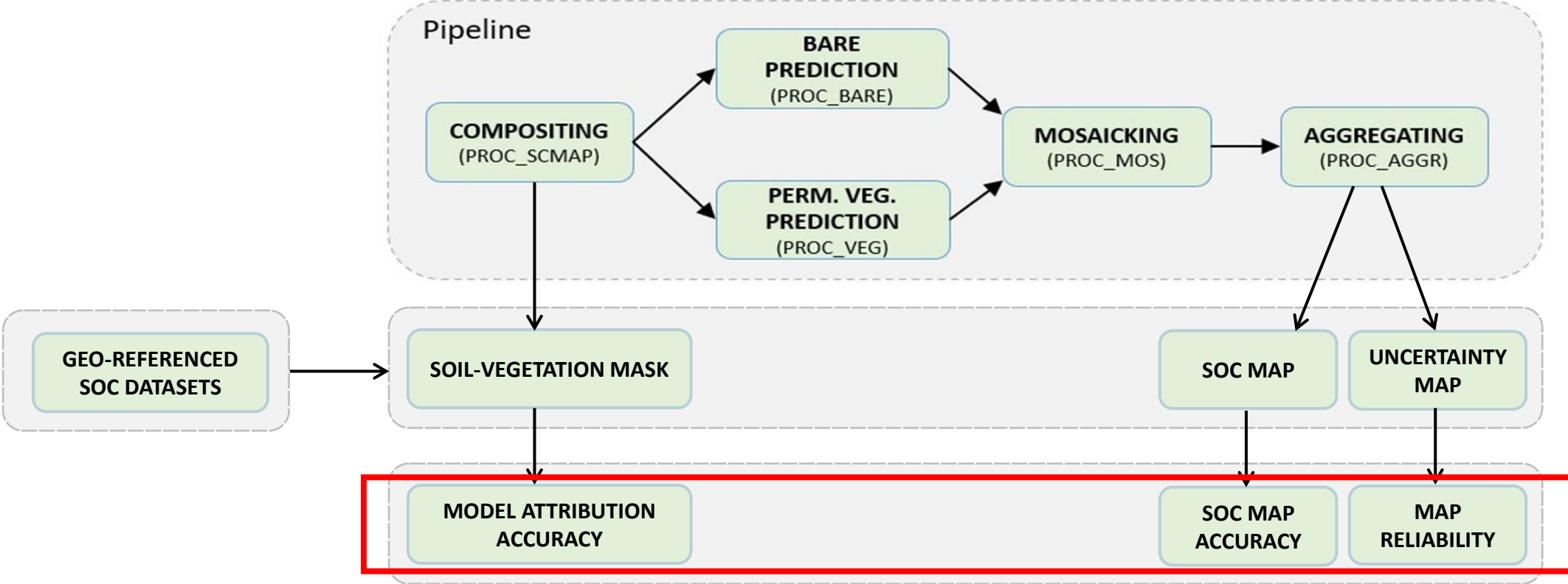
Session 3 – SOC prediction maps; results for the Czech Republic

Asa Gholizadeh



ESA Symposium on Earth Observation for Soil Protection and Restoration

Work flow

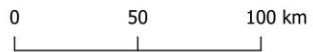
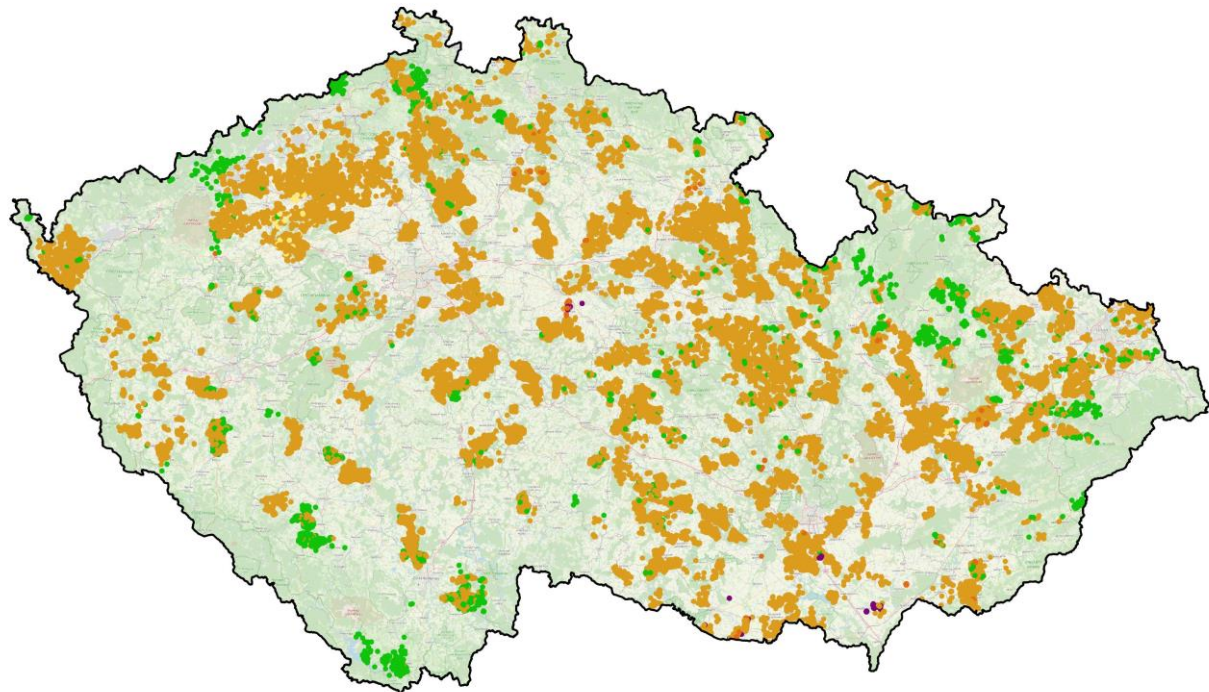


Geo-referenced SOC data set

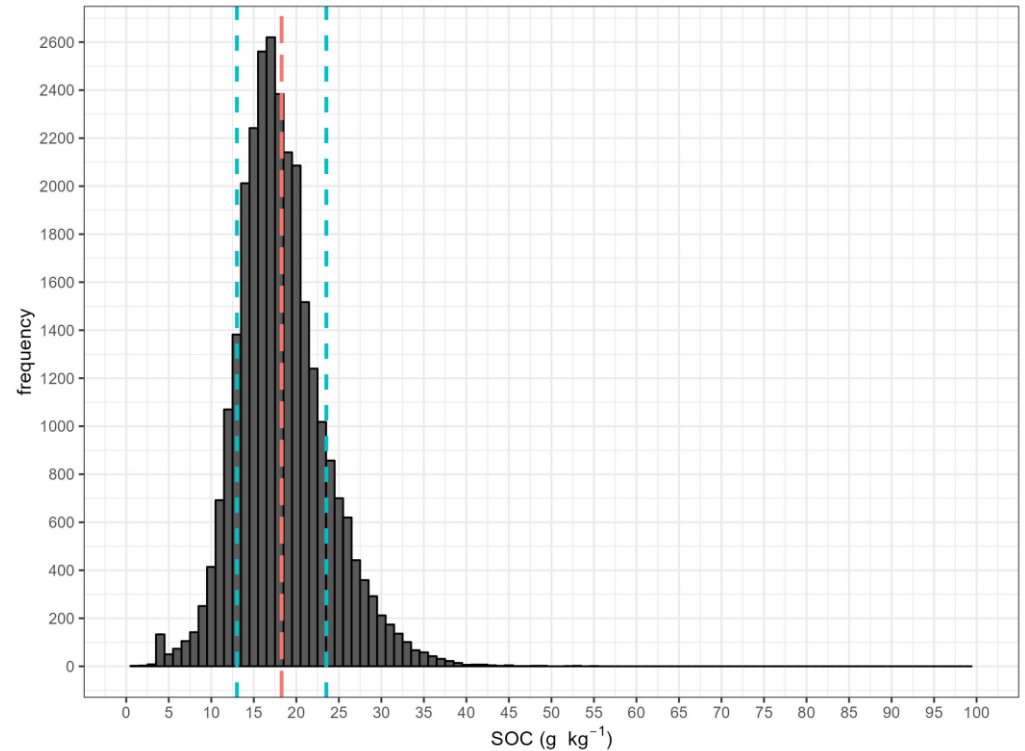
Distribution of validation points dataset across the Czech Republic

Czechia - AZZP (observed)

Geo-referenced SOC dataset in the Czech Republic (n= c. 5,000 per year)



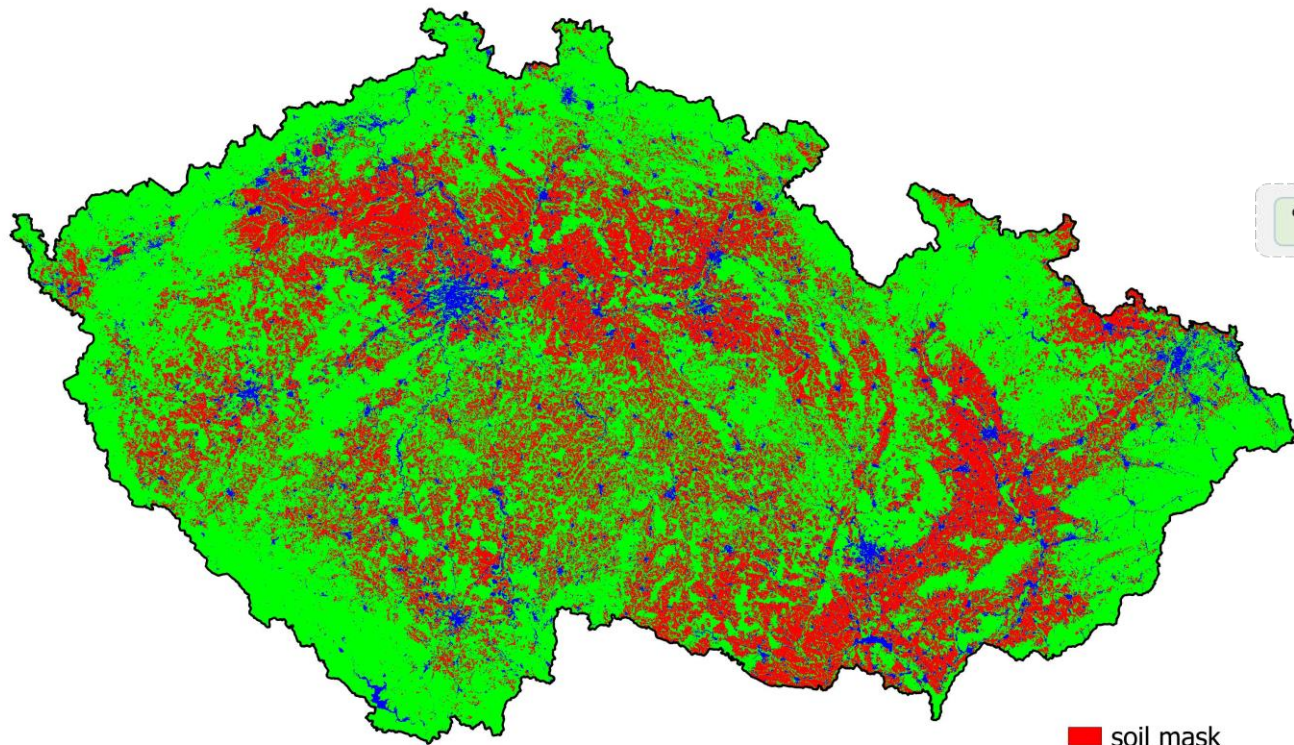
- fallow
- other
- orchard
- vineyard
- hop garden
- arable land
- grassland



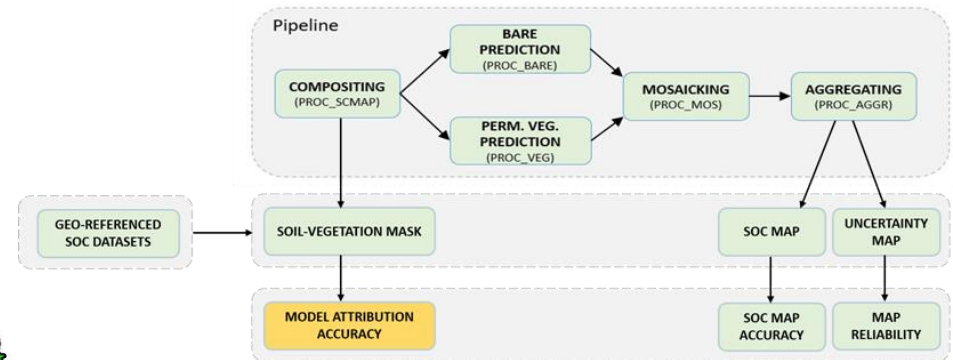
Routine soil agrochemical testing of agricultural soils by **Central Institute for Supervising and Testing in Agriculture**

Model attribution accuracy

Worldsoils mask for the Czech Republic (2018-2020)



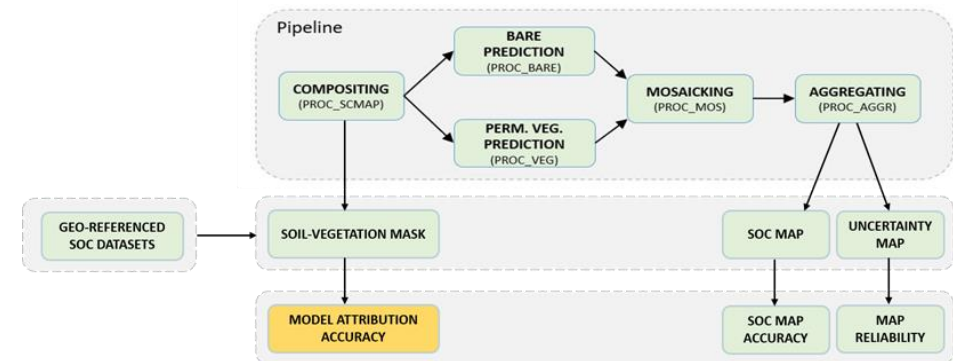
■ soil mask
■ vegetation mask
■ other



Model attribution accuracy

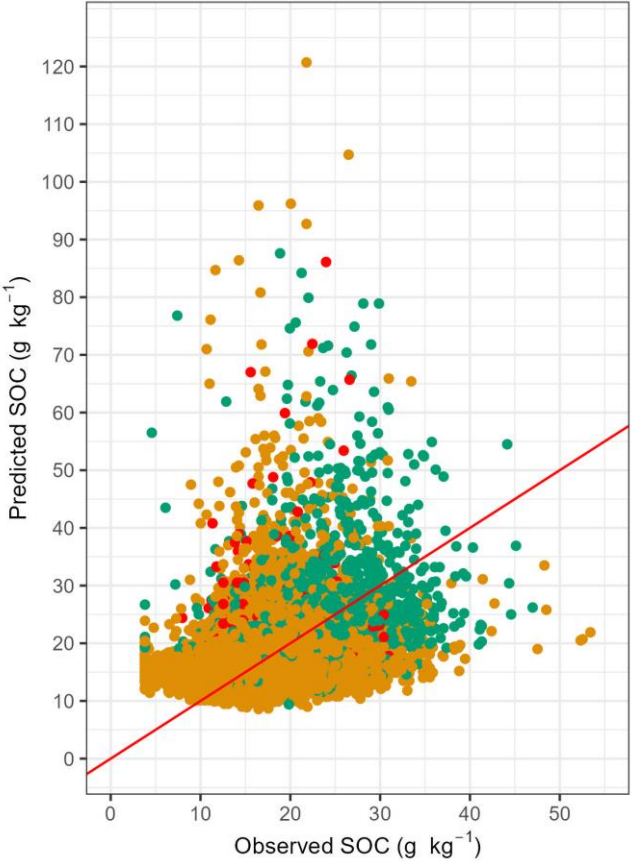
Confusion matrix of reference point data for model attribution

| 2018-2020 | Point data (validation set) | | | Accuracy | 0.95 | |
|------------|-----------------------------|------------|----------|----------|-------|------|
| | Arable land | Grasslands | Orchards | | | |
| Prediction | Bare soil | 12,019 | 104 | 58 | Kappa | 0.79 |
| | Permanently vegetated | 322 | 1,245 | 149 | | |
| | Others | 2 | 1 | 0 | | |



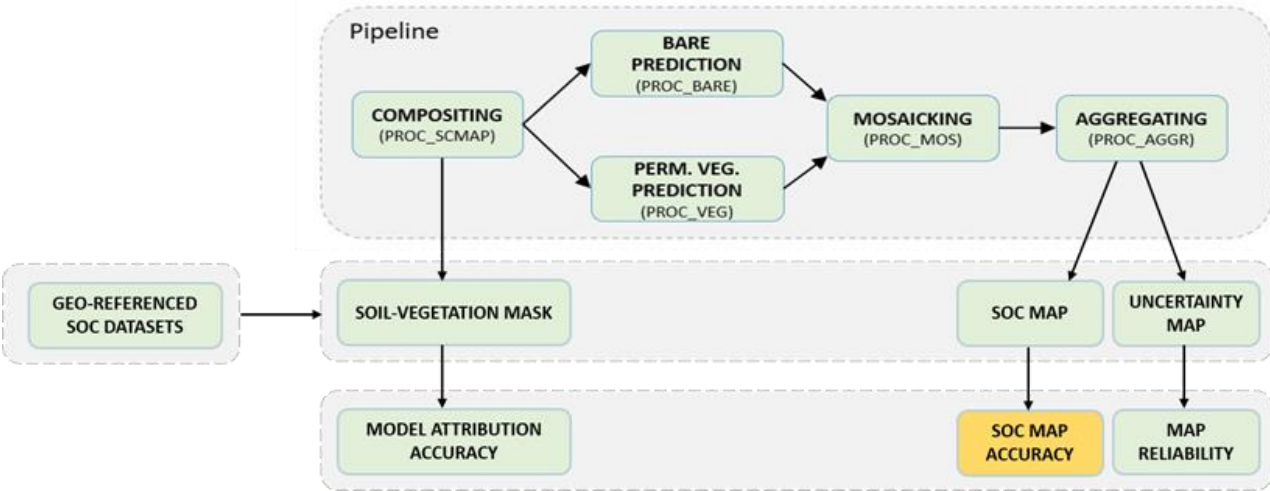
SOC map accuracy

Validation of 2018-2020 pixel values against corresponding reference data

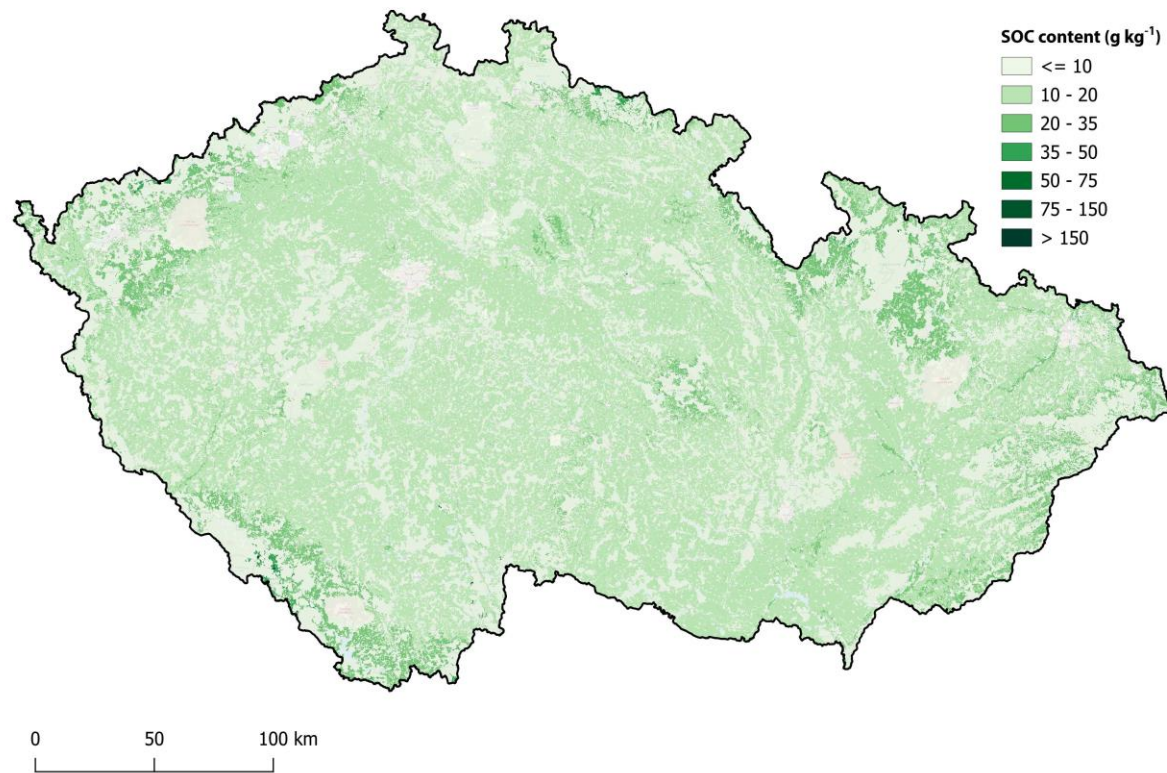


landuse ● arable land ● grassland ● orchard

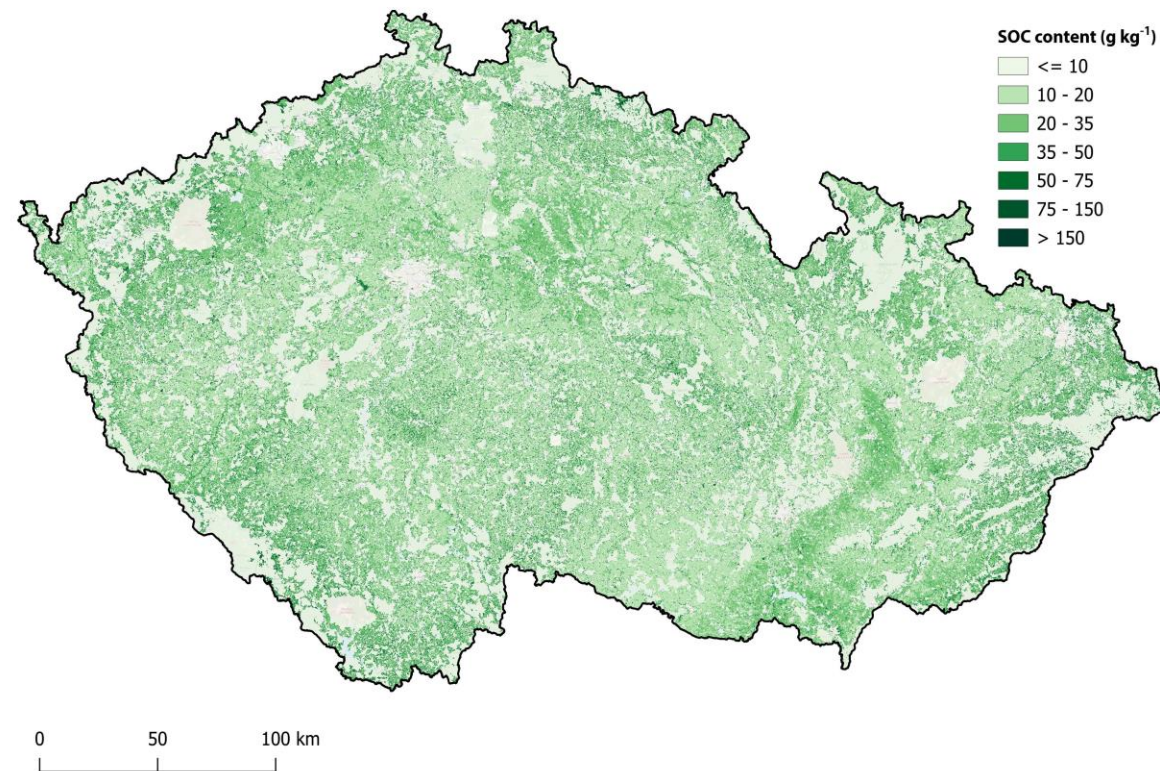
| RMSE | R ² | RPD | RPIQ | CCC | Bias | NSE | NRMSE |
|------|----------------|------|------|------|-------|-------|-------|
| 5.69 | 0.11 | 0.91 | 1.07 | 0.32 | -0.28 | -0.21 | 0.31 |



SOC map accuracy



National SOC map 2020

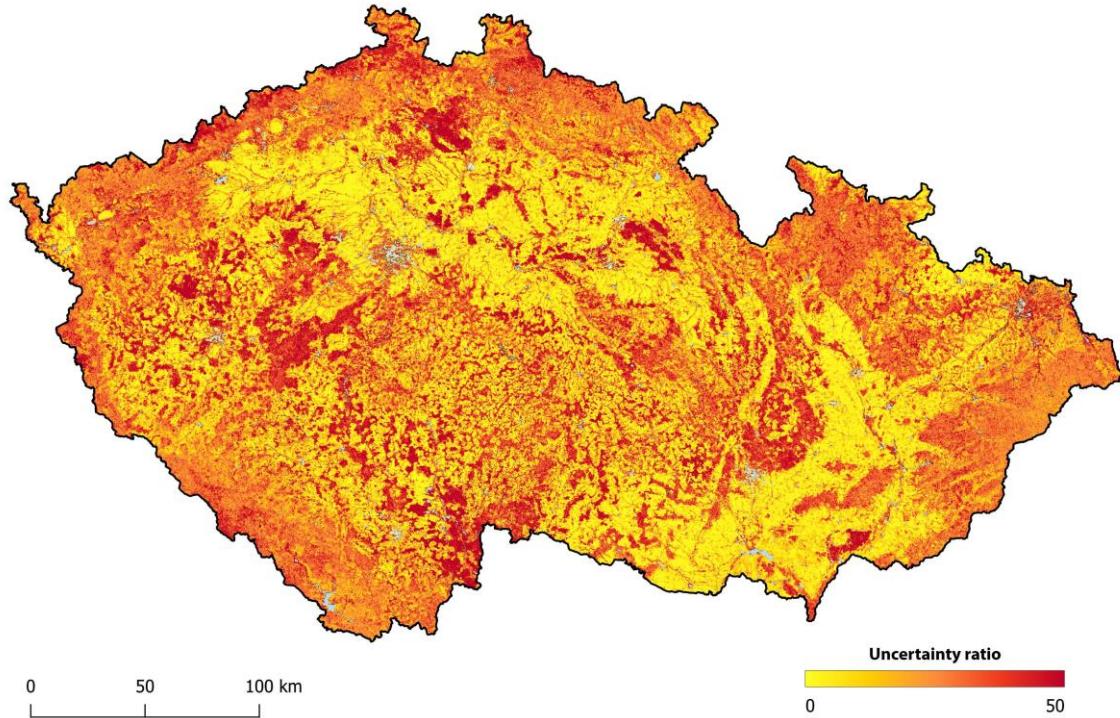


Worldsoils SOC map 2018-2020



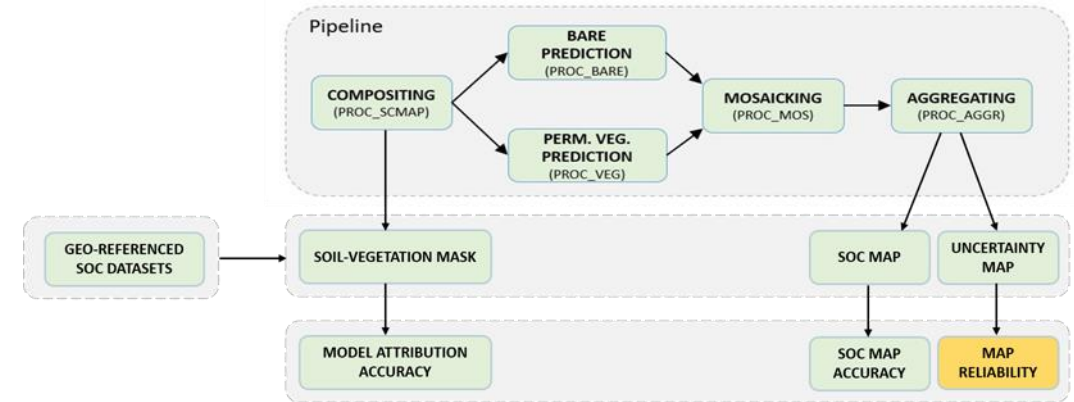
Map reliability

Czechia - WOSOMS (2018-2020) - uncertainty



Model uncertainty pattern mostly followed by the bare soil/vegetated area prediction.

For 2018-2020, 31% of the reference SOC data fell within the predicted confidence interval.





Thank you!

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World Soil Information

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