

The German National Soil Inventory



Soil sampling for climate change abatement

As part of the National Soil Inventory, the German Agricultural Soil Inventory delivers a harmonized, representative, and reliable database of carbon stocks in agricultural soils for the reporting of greenhouse gas emissions. Moreover, the project enhances our understanding of soil carbon dynamics and will deliver options for the accounting of increased carbon storage in soils as greenhouse gas mitigation strategies.

Methodology

- 8*8 km grid: 3108 points under arable field or grassland
- started in 2011, ends in 2018
- sampling depths: 0-10, 10-30, 30-50, 50-70, 70-100 cm, additional sampling of horizons
- data evaluation in progress:
 - i. drivers of carbon stocks via machine learning
 - ii. vulnerability of carbon in organic and mineral soils via density fractionation, NIRS, and incubation
 - iii. characterization of arable soils as sink/source for carbon via modelling
 - iv. generation of soil carbon maps

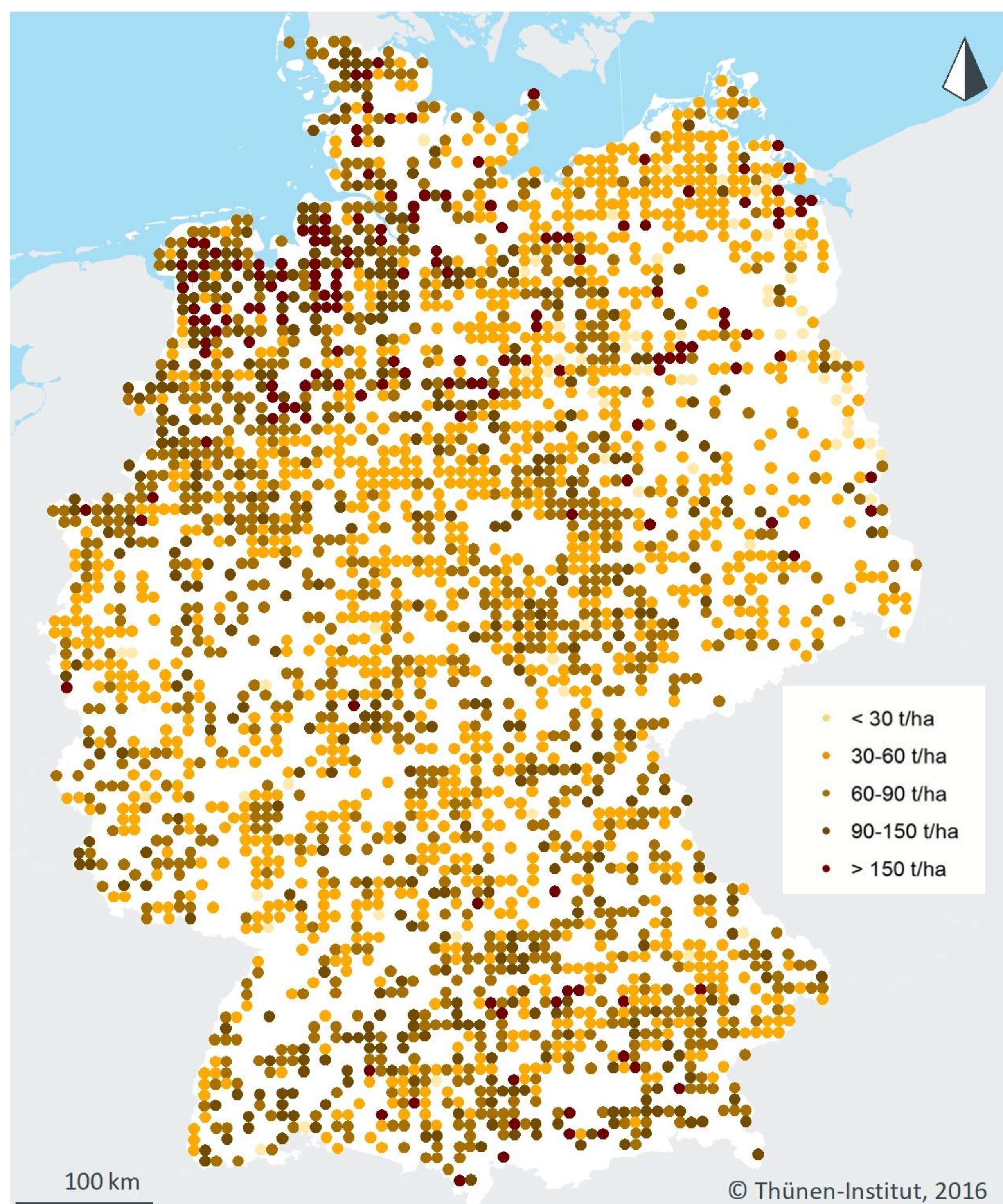
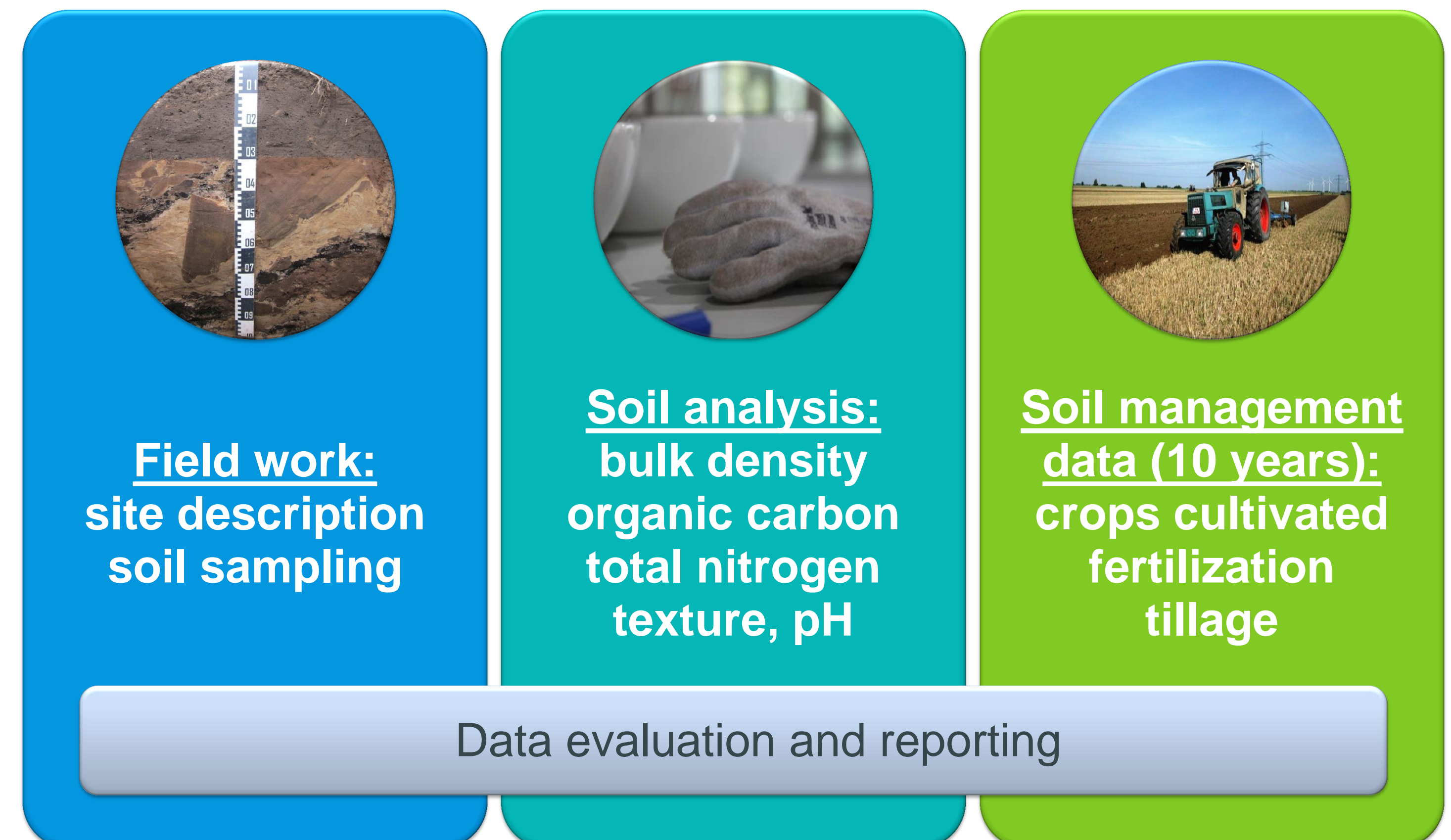


Fig 1: Stocks of soil organic carbon in the top soil layer (0-30 cm); German Agricultural Soil Inventory (Nov 2017).

Outcomes

- about 2800 sampling points are analysed for stocks of soil organic carbon (Fig. 1) and 2000 for management data (Fig. 2)
- first results strongly differentiate by i. region (e.g. soil type, stratigraphy), ii. cultivation management, iii. land use (Fig. 1, 2) → data evaluation requires reasonable stratification and data processing

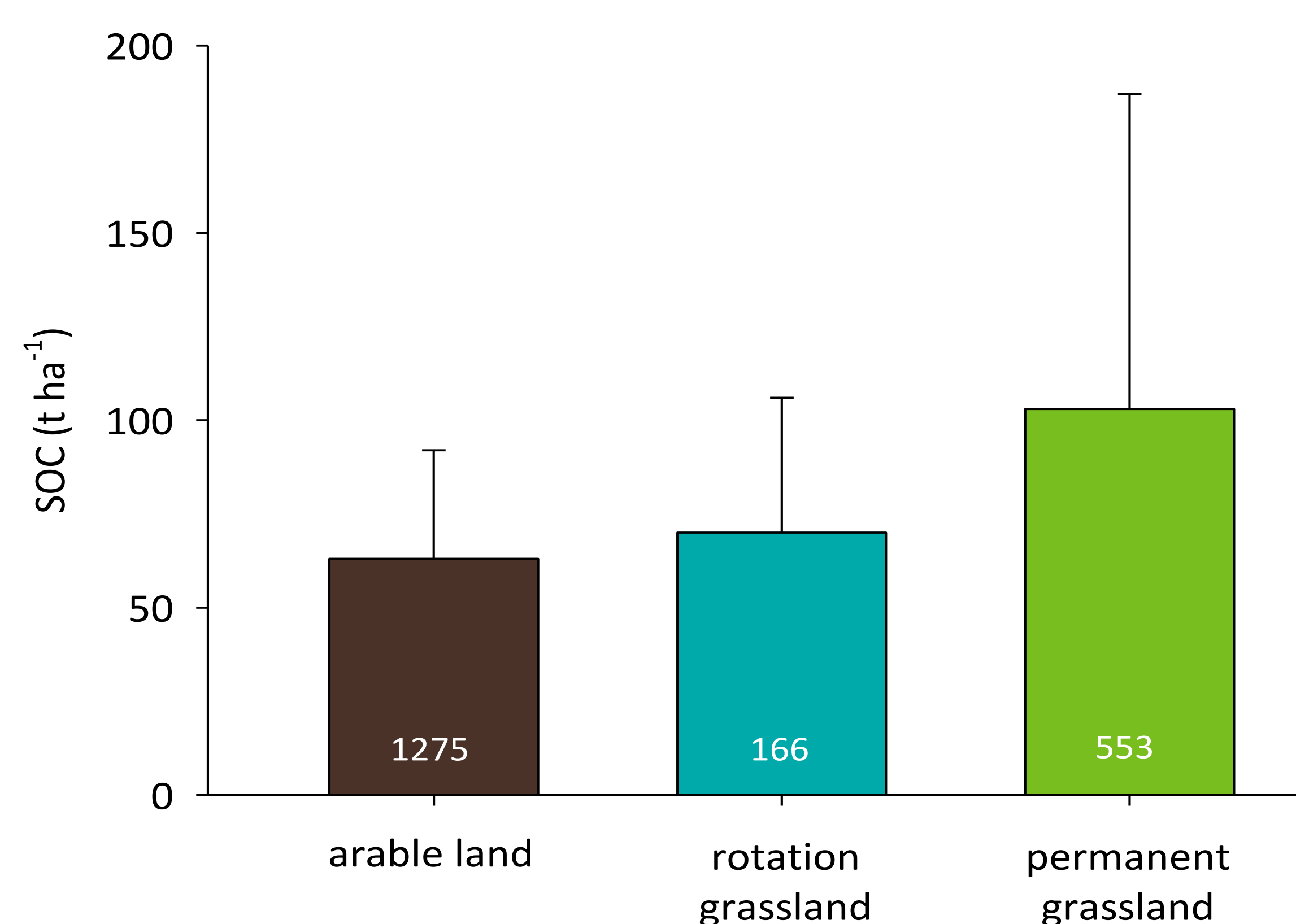


Fig 2: Stocks of soil organic carbon (SOC) in 0-30 cm of agricultural sites under different land use systems; mean of n (white numbers) and standard deviation; German Agricultural Soil Inventory (Nov 2017).

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