(1) DLR Oberpfaffenhofen (DLR), Earth Observation Center (EOC), Germany (2) ISRIC – World Soil Information, Wageningen, The Netherlands



The **SoilSuite** contains a collection of different image data products that provide information about the spectral and statistical properties of European soils and other bare surfaces such as rocks. It is created using DLR's Soil Composite Mapping Processor (ScMAP), which utilises the Sentinel-2 data archive.

Data availability: The SoilSuite has been published in December 2024 under the license CC-BY-4.0. The data is available on a free and open bases from two platforms. The platforms provide several web services and the download capability. Further, the data is described by STAC metadata.

Bare Surface Reflectance Composite (Mean)

Bare Surface Reflectance Composite (Std Dev)

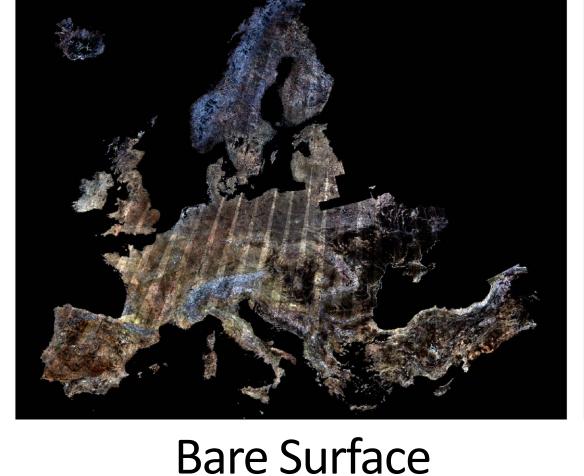


Reflectance Composite (Mean)

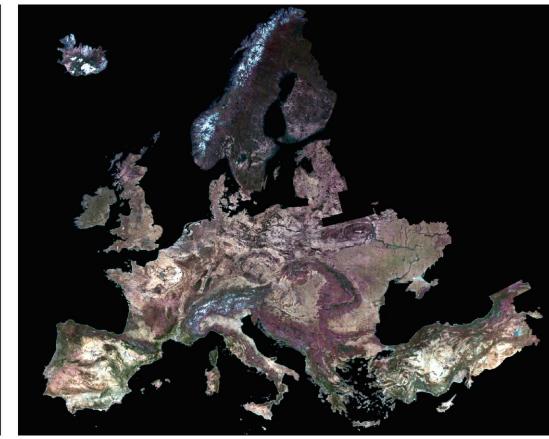
Reflectance Composite (Std Dev)











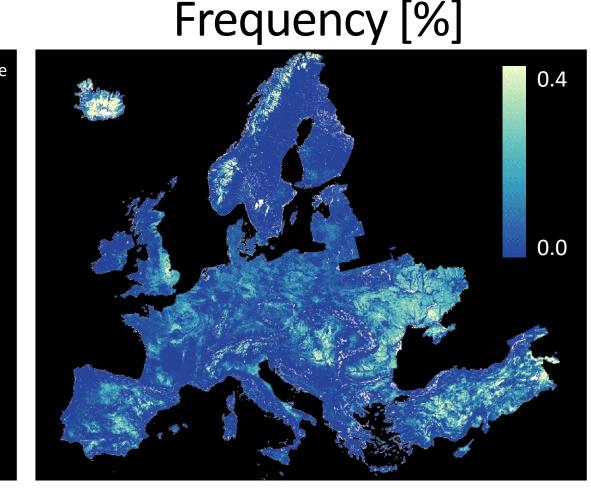
Valid Pixel

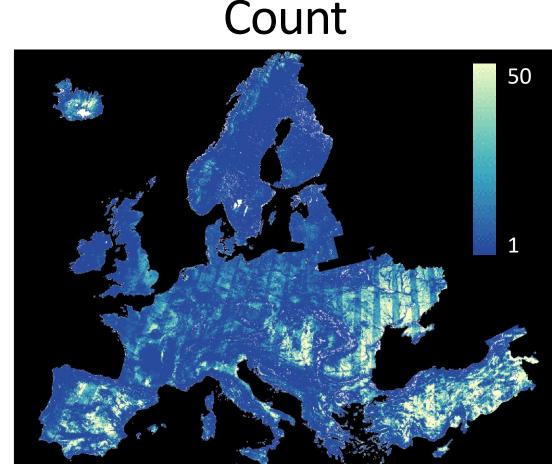
SoilSuite Data Base

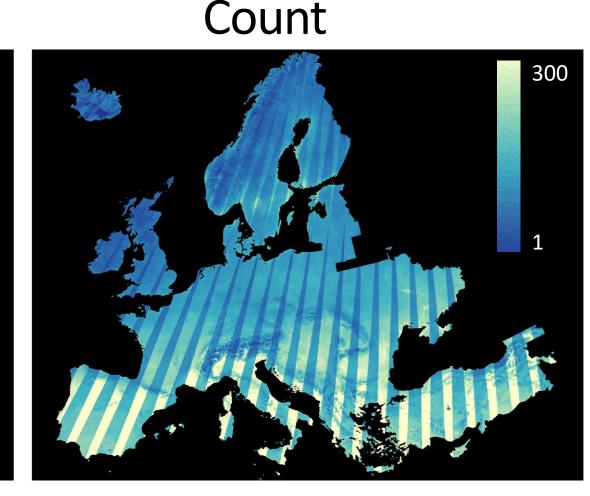
- Sentinel-2
- 2018 2022
- < 80 % cloud cover
- > 20° sun elevation
- 20 m pixel size
- 1145 MGRS tiles
- 445806 Sentinel-2 scenes

Mask

Bare Surface







Soil Composite Mapping Processor (SCMaP)

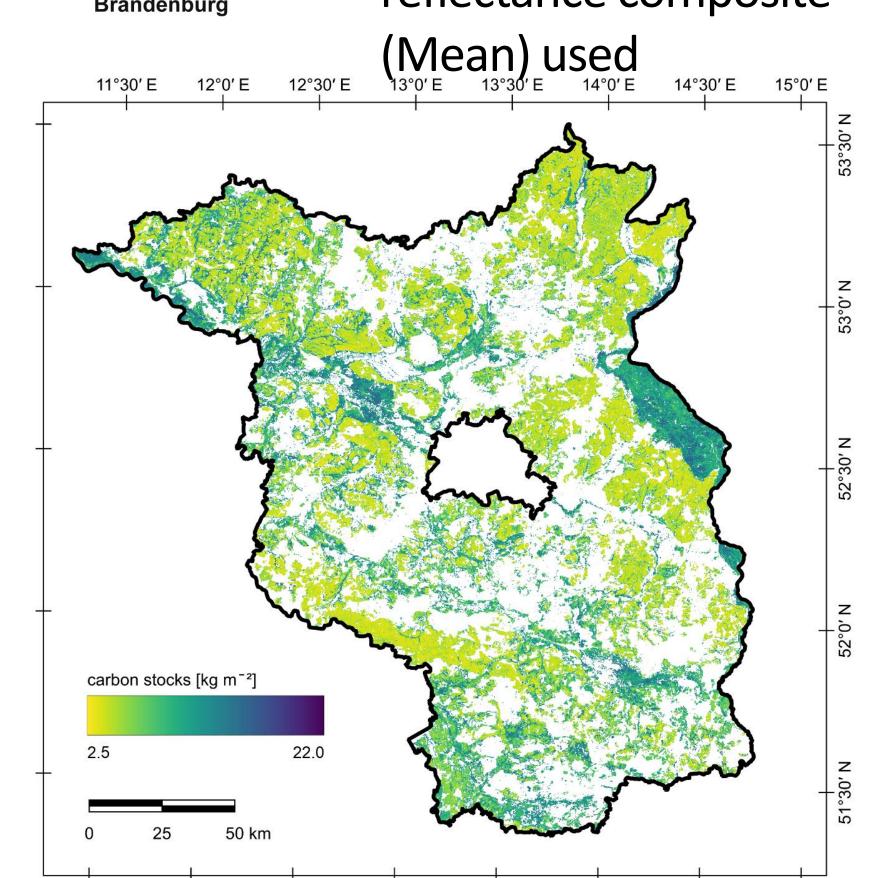
- SCMaP processor deployed at DLR's terabyte HPC platform
- Bare surface / soil detection using a spectral index threshold approach (¹Rogge et al., 2018; ²Heiden et al., 2022)
- Histogram SEparation Threshold (HISET) method for automated threshold definition (2Heiden et al., 2022, ³Karlshöfer et al., 2025)
- Enables regionalized threshold definition taken into account the biogeographic conditions of the various regions across Europe
- Index evaluation results in the combined NDVI+NBR index as the best choice for Europe (³Karlshöfer et al., 2025)

Output SoilSuite Regionalised **SCMaP - Compositing Input Data Threshold** Reflectance **Definition** Blue outlier filter **Averaging** Sentinel-2 Reflectances+ Spectral index Cloud Masks calculation Bare surface HISET **ESA** reflectance Landcover WorldCover Masking - Stdev -Soil-Threshold specific -based Spectral Threshold Cloud Averaging Database bare and surface haze selection filter Statistics ¹ https://doi.org/10.1016/j.rse.2017.11.004 ² https://doi.org/10.3390/rs14184526 ³ Karlshöfer et al., Geoderma, (accepted)

Monitoring Carbon Stocks at regional scale



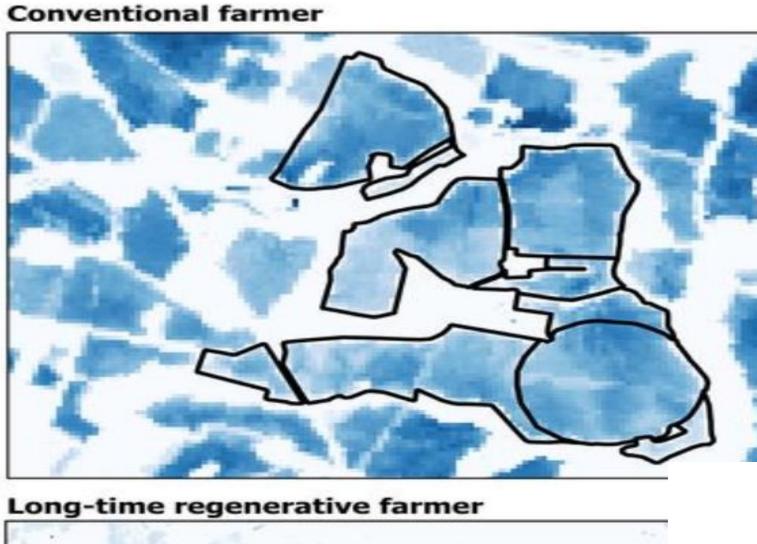
- Digital soil mapping approach
- SoilSuite: Bare soil reflectance composite

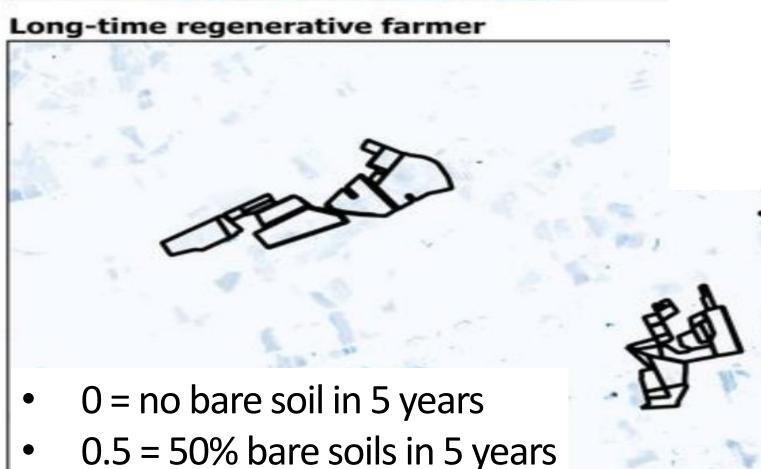


Supporting the monitoring of regenerative agriculture practice

SOILCAPITAL

SoilSuite: Bare soil frequency used





Preoperational system for the monitoring of soil organic carbon content in top soils



UCLouvain





- ESA WorldSoils project
- Soil organic carbon content [dg/kg]
- 50 m (regional), 100 m (global)

