Geophysical Research Abstracts
Vol. 21, EGU2019-8099, 2019
EGU General Assembly 2019

Analysing the potential of exposed soils in European countries based on Landsat imagery from 1984-2017 using the Soil Composite Mapping Processor (SCMaP)

Simone Zepp (1), Marianne Jilge (1), Derek Rogge (2), and Uta Heiden (1)

(1) German Aerospace Center, Remote Sensing Data Center, Wessling, Germany (simone.zepp@dlr.de), (2) Hyperspectral Intelligence Inc., Gibsons, BC, Canada

High temporal and spatial soil information is important to analyse soil developments and to monitor long-term changes to avoid soil degradation. This information is essential to achieve sustainable food security, health and high productivity of soils. In Europe naturally exposed soils occure rarely. Mainly agricultural regions can provide areas of exposed soil for short periods of time during a year. The Soil Composite Mapping Processor (SCMaP) is a fully automated approach on a per-pixel based bare-soil compositing to overcome the issue of limited soil exposure. It is based on the alternating behaviour of a vegetation index and allows the automated generation of cloud-free multispectral soil reflectance composites that can support high temporal and large scale top soil analysis. Besides the multispectral soil reflectance composites two additional products are generated based on multispectral Landsat imagery (LT 04, 05, LE 07 and LC 08). The output of five year periods include the distribution of exposed soils and statistical information related to soil use and intensity for time series (1984-2017). A validation of the distribution of exposed soils with statistical data from regional agricultural surveys (e.g. Destatis) showed a high plausibility for Germany.

SCMaP was initially developed and validated for the agriculture dominated country Germany. Different climatic conditions, land use and agricultural practices have an influence on the extraction of the bare soil composites. Technically, the processor is applicable to various countries with agricultural activities. Thus, several European countries have been processed to test the transferability of the method to different climatic conditions and agricultural practices.

This work aims for 1) applying, investigating and adapting the required threshold definition of SCMaP for testing its applicability for different climatic regions in various European countries and 2) to present the resulting multi-temporal products of the different time periods that have the potential to detect exposed soil changes on a wider spatial scale. First adaptions of the processor show a realistic distribution of exposed soils for Bulgaria, Romania, Czech Republic and Spain.