Poster

Identifying Land Use Intensity of Permanent Grassland in Germany with Sentinel-1 SAR Imagery

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The intensity of grassland use is an important factor determining biodiversity, water quality, greenhouse gas storage as well as the yield and economical value. Finding an optimal trade-off between economy (intensive management) and ecology (extensive management) is often site-dependent. However, there is no Germany-wide information on the utilization intensity of grasslands.

With remote sensing, the use intensity of permanent grassland can be determined by identifying mowing frequencies or certain patterns arising from grazing. For this, a dense time-series of satellite images is needed which can be achieved with Sentinel-1 SAR data. As SAR signals are influenced amongst other by the physical properties of the vegetation on the ground, changes due to mowing or grazing lead to strong changes in signal.

In this study, parcel and management information from farms in different geo-ecological regions of Germany with different management strategies are used to determine grassland utilisation and its intensities. For this purpose, the pixel-wise backscatter values of Sentinel-1 satellite images within the boundaries of parcels are combined into different indices. The time series of these indices per parcel are examined regarding recurring patterns due to management.

As a first step, detailed management and parcel information from the test-sites are harmonized in a data base. These information plus precipitation data are used to explain the SAR signals at the individual parcels and develop a model. In a second step, the model is used to extrapolate it from the individual study sites throughout Germany.