Application of Copernicus Global Land Service vegetation parameters and ESA soil moisture data to analyze changes in vegetation with respect to the CORINE database

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Vegetation and soil moisture monitoring are complicated and expensive with in-situ measurements thus remote sensing is a favorable tool to monitor changes in the land surface. Under the supervision of the European Environment Agency and the Joint Research Centre the Copernicus Global Land Service (GLS) became a prominent service providing satellite data for climatological purposes. In this study the Copernicus GLS provided leaf area index (LAI) and dry matter productivity (DMP) data are used at 1 km resolution over Europe. Based on the LAI, growing season start and length is also determined. Around 18 years of data (2000-2018) is analyzed to look for changes in vegetation. Using the CORINE land cover categories changes in vegetation parameters are also analyzed by differentiating between land cover categories. Furthermore, the ESA (European Space Agency) Climate Change Initiative soil moisture data is coupled with the changes in vegetation parameters. In the case of soil moisture, the data is available at a 0.25° resolution, therefore vegetation parameters are interpolated accordingly.

Initial results show, that the maximum value of LAI increases the most in North Europe, the increase is almost linear. Changes in LAI derived start of growing season shows an earlier start in Central Europe and a later start in North Europe. The connection between vegetation parameters and soil moisture varies based on land cover and location. The strongest correlation is found for summer soil moisture and autumn LAI for arable lands and a negative correlation is found for shrublands.