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## Fusion of Sentinel and PlanetScope images for high resolution soil moisture mapping: Algorithm and preliminary validation

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High resolution remote sensing images plays a critical role in detection and monitoring of land degradation and development. Monitoring the soil parameters represents great importance for sustainable development and agriculture, as well as smart food production. The space segment component of the Copernicus programme (e.g., Sentinel-1, Sentinel-2 etc.) enables continuously monitoring of Earth's surface at 10-m spatial resolution. New technologies, development, and minimization of sensors led to the development of micro-satellites (e.g., PlanetScope). These satellites allow us to monitor the Earth's surface daily in 3-m spatial resolution. The developed algorithm for soil moisture mapping is based on the fusion of Sentinel-2 and PlanetScope images. This allows a soil moisture mapping in high spatial resolution. Soil moisture was estimated based on the Leaf Area Index (LAI) and Enhanced Vegetation Index (EVI) using modified water cloud model. Ground-truth data were collected from 15 stations of the International Soil Moisture Network across the globe and used for mapping and validation of soil moisture. The developed algorithm provides a new knowledge that can be widely applied in various research for the detection and monitoring of land degradation and development.