

## DryLand – Use of hyperspectral remote sensing for the monitoring of agricultural areas with a particular focus on drought stress

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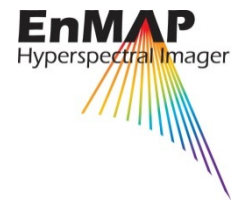
### Abstract:

The aim of the project DryLand is to derive indicators for drought stress of agricultural crops. In case of water deficiency remote sensing data with spectral high resolution is required shortly after occurrence. This data will be provided in the future by the hyperspectral satellite mission EnMAP.

Spectral reflectance characteristics of crops are used to derive information about drought stress and related indicators. For this purpose, different physically and empirical based modeling approaches will be coupled to benefit from both strategies. Radiative transfer models (PROSAIL) and their inversion based on EnMAP data combined with additive information from Sentinel-2 and Rapid-Eye data increase the forecast accuracy of leaf- and canopy parameters. Existing drought stress indices (NSMI, MSI, WI, NDWI) will be examined in a hyperspectral context and supplemented by appropriate newly derived indices.

Since soil conditions have a major influence on the nutrient supply of the plants, relevant soil parameters will be derived from multi- and hyperspectral data and integrated into the analysis as regions of similar soil conditions.

A deeper examination of drought stress indicators is performed by coupling a dynamic plant growth model (APSIM) with a radiative transfer model for different drought stress scenarios. Model forecasts will be adjusted and improved during the growing season by the assimilation of Sentinel-2 data. Drought stress experiments under controlled field conditions and hyperspectral aerial images are used to validate the achieved results.



### DryLand

**Duration:** 01.12.2014 – 30.12.2017

**EO Data Source:** RapidEye, Sentinel-2, HySpex, SVC HR-1024i

**Support Program:** PhD Program for EnMAP utilization preparation

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<http://www.enmap.org/>

<http://www.igf.uni-osnabrueck.de/en/research/remote-sensing/21-inhalte-en/research/315>