

Modelling Responses of *Dehesas* with Hyperspectral Remote Sensing

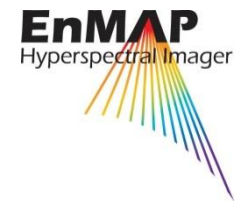
Max Planck Institute for Biogeochemistry

Abstract:

The scope of the project is the scientific preparation of the hyperspectral satellite mission EnMAP (Environmental Mapping and Analysis Program). The scientific lead of the mission lies with the Remote Sensing section at GFZ Potsdam, supported by a Core Science Team (ECST). Tasks of the ECST include (i) updating the EnMAP Science Plan, (ii) organising and conducting workshops and summer schools, (iii) coordinating networking and dissemination activities, and (iv) developing algorithms for processing and analysing hyperspectral data as well as implementing them into the free software package EnMAP-Box, developed in the frame of the EnMAP scientific preparation program.

The Department of Biogeochemical Integration at the Max Planck Institute for Biogeochemistry has contributed in the following aspects:

- Development of new methods to characterize the spatiotemporal variability of functional parameters of vegetation, related to carbon and water gas exchange, from hyperspectral proximal sensing
- Evaluation of the new methods with hyperspectral airborne and EnMAP imagery, leading to robust characterization of vegetation functional traits at ecosystem scale in eddy covariance stations
- Improvement of the radiative transfer, energy balance and photosynthesis modeling in Mediterranean grasslands and canopies featuring mixed green and senesced leaves: the new senSCOPE model
- Evaluation of the potential of EnMAP Photochemical Reflectance Index and other spectral indices to predict gross primary production in semi-empirical models



ECST – Vegetation function, carbon and water and fluxes

Duration: 01.01.2017 – 31.12.2019

EO Data Source: EnMAP, CASI

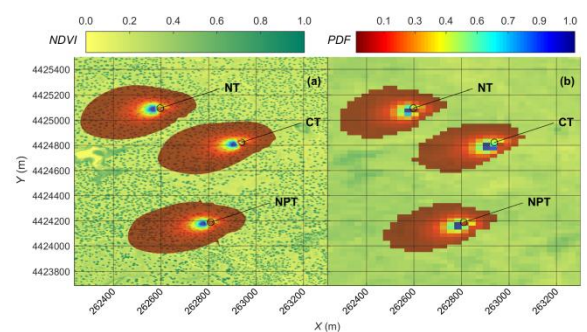
Support Program: EnMAP Utilization Preparation

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Convolution of footprint climatology probability distributions and hyperspectral imagery of (a) CASI, and (b) EnMAP sensors. Three eddy covariance towers monitor the large scale fertilization experiment (MANIP) in the study site of Majadas de Tiétar, Cáceres, Spain. Convolution is applied to minimize the spatial mismatch between the eddy covariance and the remote sensing footprints prior to the assimilation of time series of fluxes and the hyperspectral reflectance factors. Key functional traits of vegetation are robustly retrieved from both sensors (from Pacheco-Labrador et al. (2020). Biogeosciences Discussion)