PROJECT FACTSHEET

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SENSECO

Enabling optical synergies to better characterize and predict the dynamic response of vegetation in changing conditions.

Inspiration

Vegetation is an important player in the functioning of ecosystems by its mediation of gas and energy exchange. Understanding and modelling the dynamic response of vegetation to changing environmental conditions at spatial and temporal scales is therefore fundamental to assess ecosystem change, food security and biodiversity. However, a large uncertainty remains when it comes to the net terrestrial uptake, such as how much carbon terrestrial vegetation is taking up or releasing.

Earth observation (EO) satellites provide the spatial and continuous information required to a better knowledge on terrestrial vegetation functioning. A large panel of these sensors is available, continuously growing over time. But, each one focuses on a specific spectral domain and has different properties, resulting in several types of data, retrieval and scaling methods. In addition, most studies in EO satellite of vegetation make use of only one sensor.

Upon these observations, there is a need to scale the coarse and fine resolution data at a spatiotemporal level, but also to harmonize the different Radiative Transfer Models (RTM) by improving the retrieval and scaling methodologies.

Innovation

SENSECO is a COST action based on previous international initiatives (OPTIMISE, EUROSPEC). This project aims to make optical EO measurements of ecophysiology at various spatial and temporal scales, enabling synergistic multi-sensor use. SENSECO also intends to foster knowledge exchange on scaling methods within Europe and to coordinate overarching analysis.

For that, the project will focus on four main research axes. The first one aims to close the scaling gap between leaf and satellite measurements whereas the second one has the objective to close the temporal gap by passing from daily observations to seasonal trends. Another important axis is to realize synergy between passive EO spectral domains. Finally, SENSECO intends to establish data quality through traceability and uncertainty. By developing this innovative approach on how to realise synergies between passive EO spectral domains (e.g. visible/NIR, fluorescence etc.), the research network aims to provide a deeper insight into the relations between spectral features and associated plant conditions.

Impact

This new research network will provide homogenized protocols and methods for synergistic use of multi-sensor approaches, allowing best practice protocols for the detection and characterization of different stressors at different phenological stages of the vegetation. In parallel, it will enable guidelines, headed to agricultural managers and other stakeholders, on how multiple sensors can best be used for assessing crop water and nutrient requirements. As a result, the socio-economic impact of EO data will increase.

At the COST Action level, these activities will lead to a clear-cut advance in the knowledge of capturing and assessing scalable ecophysiology dynamics by providing the means to obtain a large number of high-quality harmonized datasets. This pioneer European networking activity will serve as an important basis for political and societal decisions that aim to anticipate growing and health conditions of vegetation in changing conditions.

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