Do you want to know more about the project, the laboratory, the team, and the training program?

Project Name: Integrated Observing Systems and Simulation Experiments to Analyze Biodiversity-Ecosystem Function Relationships in Savanna Ecosystems (BIOSSE)

Executive summary: Climate and other human-induced environmental changes jeopardize ecosystems' biodiversity and functions, many of which are ecosystem services. Biodiversity can sustain the stability of ecosystem functions in response to environmental variability, perturbations, and extreme events. Therefore, monitoring the state of biodiversity and its relationship with the ecosystem functions (BEF) at local scales is necessary to preserve ecosystem services and biodiversity. Remote sensing (RS) can potentially map different facets of vegetation and related ecosystem functions, enabling continuous monitoring of BEF relationships at management scales. The project aims to fill relevant knowledge gaps for estimating plant biodiversity from space and contribute to bridging the gap between traditional ecological methods and novel RS techniques.
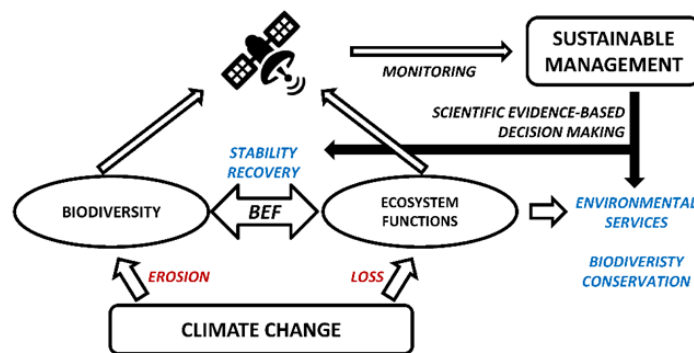

Figure 1. BIOSSE project motivation and impact.

However, the mismatch between pixel and plant sizes hampers RS's ability to quantify plant biodiversity. BIOSSE seeks to fill this knowledge gap by combining combining simulations and observations in a particularly challenging and relevant ecosystem, the savanna. The study sites cover a nutrient availability gradient (in Majadas de Tiétar, Cáceres) and an aridity gradient (in La Albuera, Badajoz).

The Laboratory: The Environmental Remote Sensing and Spectroscopy Laboratory (SpecLab) specializes in using proximal sensing to develop new methods for characterizing vegetation properties and functions from space. More information at https://speclab.csic.es/

The team: The SpecLab interdisciplinary team offers unique opportunities to initiate and develop a scientific career: https://speclab.csic.es/index.php/our-team

The training program: A multi and interdisciplinary training program will enable the Ph.D. candidate to develop new methods to infer grassland diversity using proximal sensing, RGB photography, and field data, infer savannas' plant diversity with RS data, and explore the potential of new hyperspectral missions (e.g., CHIME, ECOSTRESS) for characterizing BEF relationships.

The Ph.D. candidate will be supervised by Dr. Javier Pacheco-Labrador, Prof. M. Pilar Martín, and Dr. Rosario González, and will join the National Network on Optical Remote Sensing (NetOPS), led by Prof. M. Pilar Martín, and participate in international research stays in top institutions such as the Max Planck Institute for Biogeochemistry (DE).