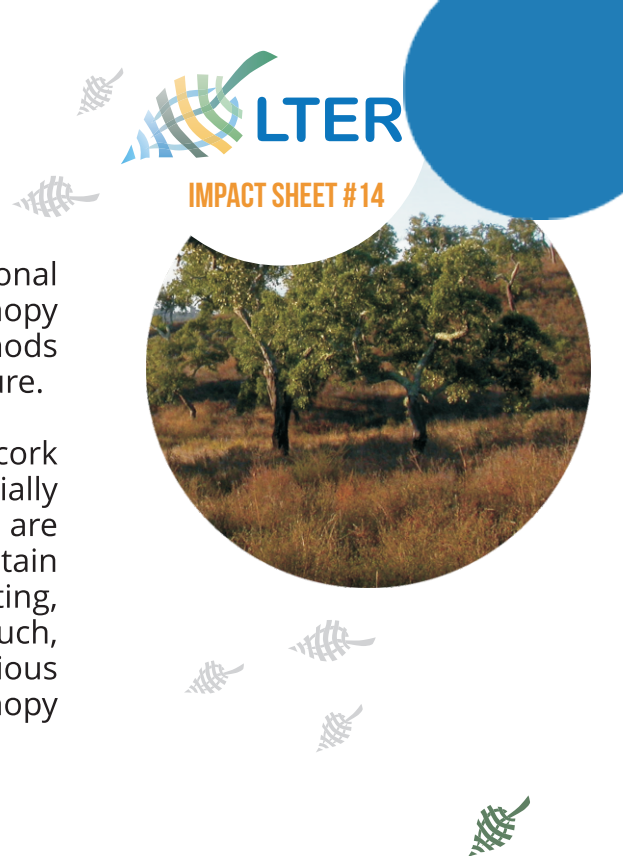


BACKGROUND REFLECTANCE ACROSS EUROPE (BRACE), PORTUGAL

LTSEER-MONTADO

It can pose a real challenge to detect and describe seasonal biological events such as leaf out, leaf off, and flowering and canopy structure in extremely heterogeneous landscapes where methods developed for homogeneous, closed canopies are prone to failure.

Montado is a savannah-like forested landscape dominated by cork and holm oaks with understory grasses. Montado typifies spatially heterogeneous and dynamically variable landscapes which are highly dependent on seasonal precipitation patterns and contain numerous multi-scale patches related to forest harvesting, livestock husbandry, pastures and crops, and fire impacts. As such, montado presents an excellent opportunity to test various approaches that try to describe its seasonal dynamics and canopy structure using remote sensing data.

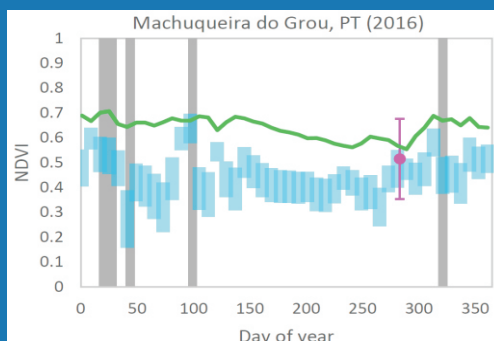
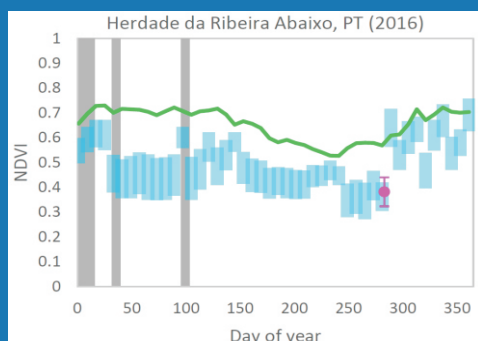


IMPACT SHEET #14

RESEARCH

Spatial and temporal patterns of forest background (understory) reflectance are crucial for retrieving biophysical parameters of forest canopies (overstory) and subsequently for ecosystem modeling. Due to this variability, remote sensing might be the only technology to provide consistent data at the required spatially extensive scales.

The objective of the BRACE project (PI: Jan Pisek; University of Tartu/Tartu Observatory, Estonia) was to collect in situ measurements of understory reflectance across diverse ecosystem research sites in Europe, including Mediterranean agro-sylvo-pastoral woodlands in Portugal (montados). The obtained results allow better understanding of limitations of the remote sensing data based retrieval method. Understory signal retrieval with remote sensing is possible in sparse and clumped canopies such as montado LTSEER platform sites. The influence of understory signal cannot be neglected under such circumstances.



Seasonal profiles of understory Normalized Difference Vegetation Index (NDVI) ranges (blue bars) and their comparison with in situ measurements (purple dots) and computed nadir NDVI values from MODIS BRDF/albedo data (green lines) for two Montado sites in 2016. Gray bars indicate MODIS BRDF parameters with lower quality flags.

LTSEER
MONTADO,
PORTUGAL



AIMS

- Collection of in situ measurements of understory reflectance across diverse ecosystem research sites in Europe;
- Validation of understory signal retrievals with remote sensing data;
- Analysis of understory variability, one of main contributors to uncertainty in present estimates of leaf emergence and senescence.

OUTCOME - IMPACT

- Remote sensing retrieval of understory signal verified across diverse forest conditions and moments during the growing season;
- Results can be used as an input for improved modeling of local carbon and energy fluxes.



Herdade da Ribeira Abaixo site



Laying out the transect for understory reflectance measurements at Machuqueira do Grou site

PRIORITY THEMES



PRIORITY ECOSYSTEM SERVICES



AREA OF RELEVANCE, ACCORDING TO SDG



SDG - UN SUSTAINABLE DEVELOPMENT GOALS



FURTHER INFORMATION

Pisek, J., Alikas, K., Lukes, P., Lundin, L., Kobler, J., Santos-Reis, M., Chen, J.M. (2017). Advances in remote sensing of forest background reflectance with MODIS BRDF data across Europe. EGU 2017 General Assembly in Vienna (23–28 April 2017). (<http://meetingorganizer.copernicus.org/EGU2017/EGU2017-1006.pdf>)