

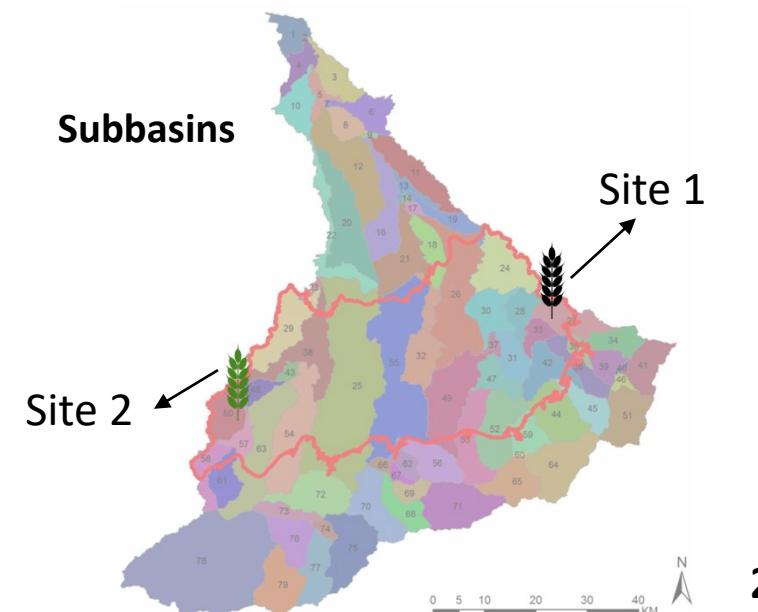
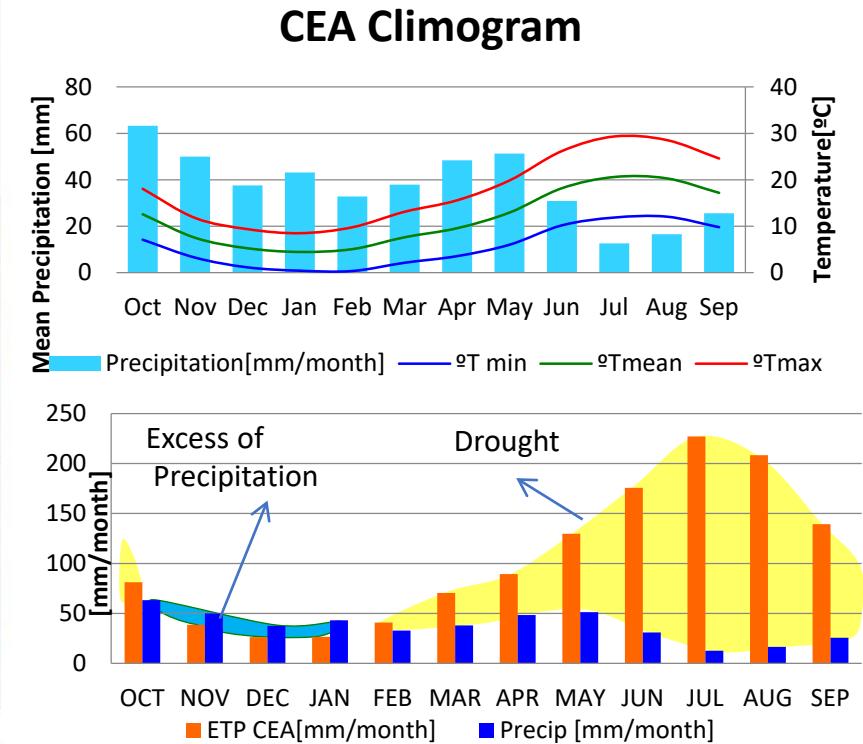
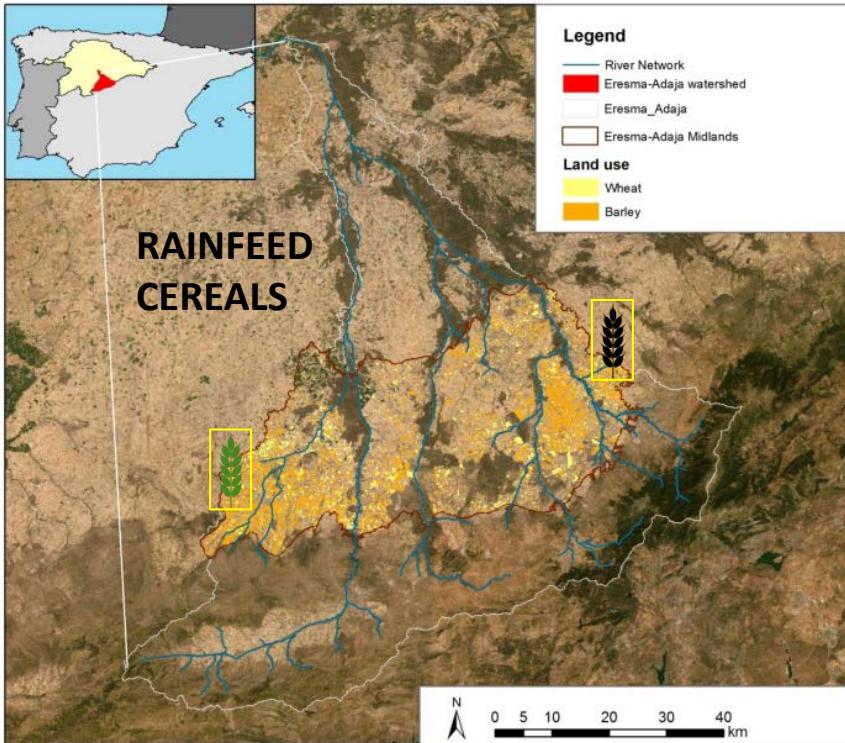
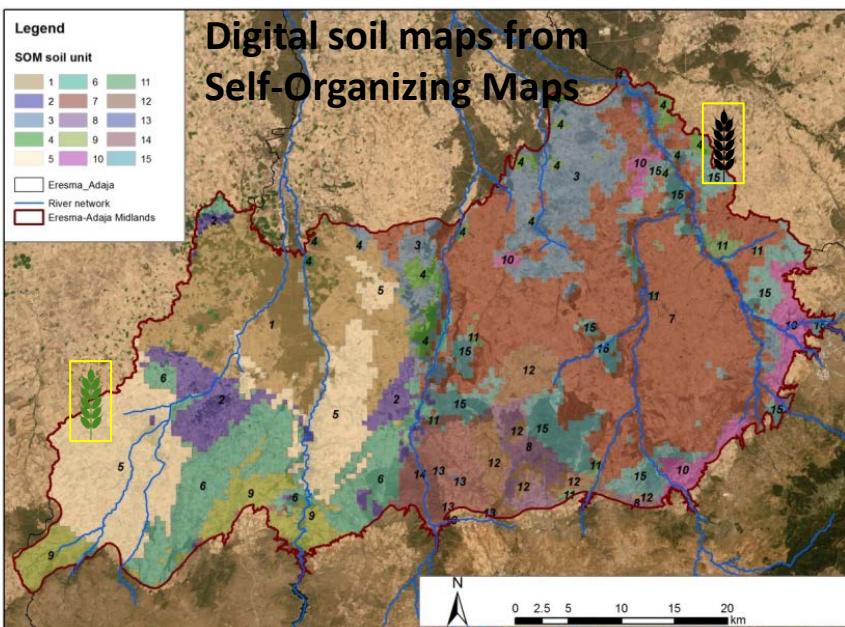
# Improving the analysis of the soil-plant-atmosphere system through earth observations in large mono-crop cereal sequences

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*David Rivas-Tabares, Juan J. Martín-Sotoca,  
Antonio Saa-Requejo, and  
Ana María Tarquis*



# Study area and climate

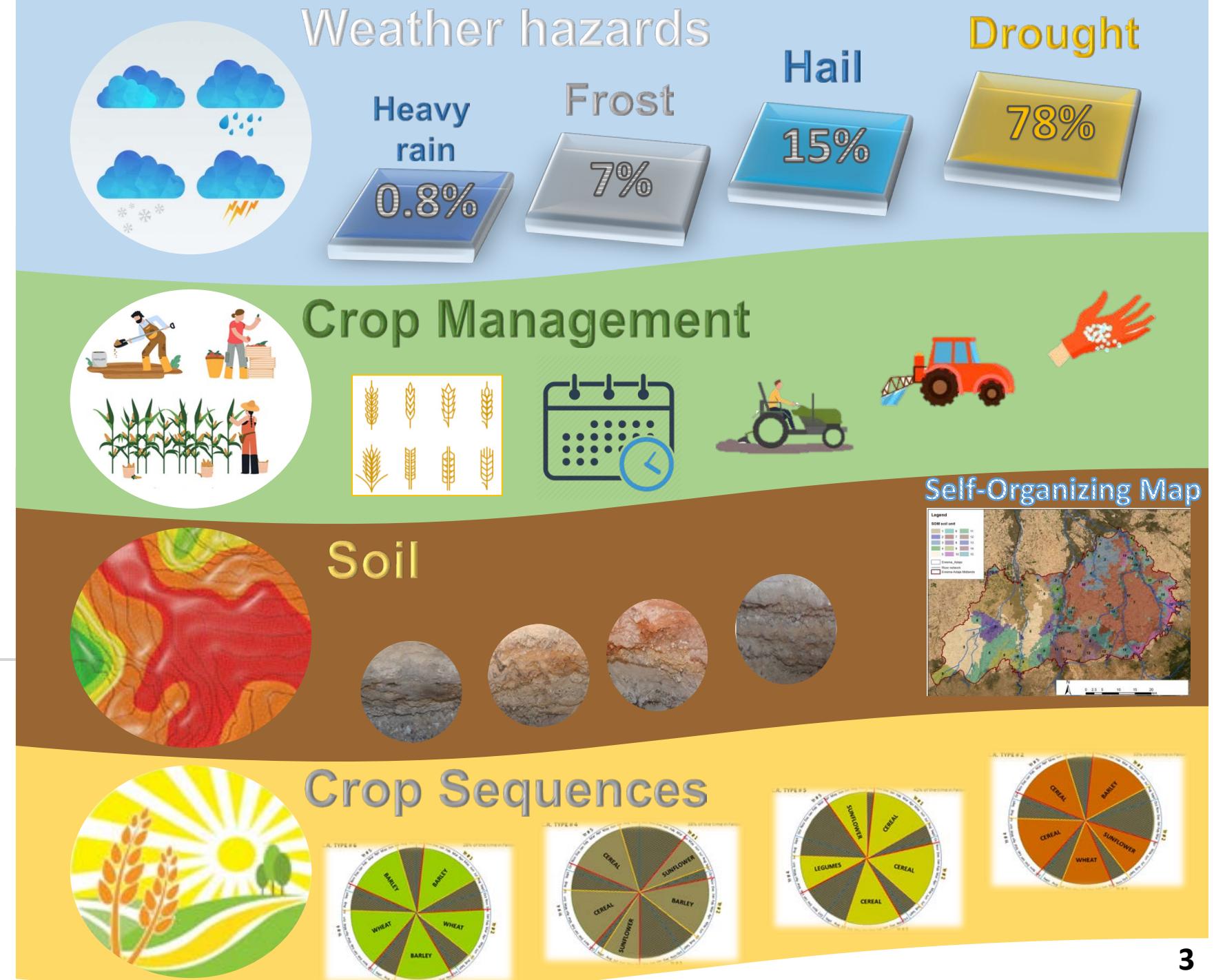


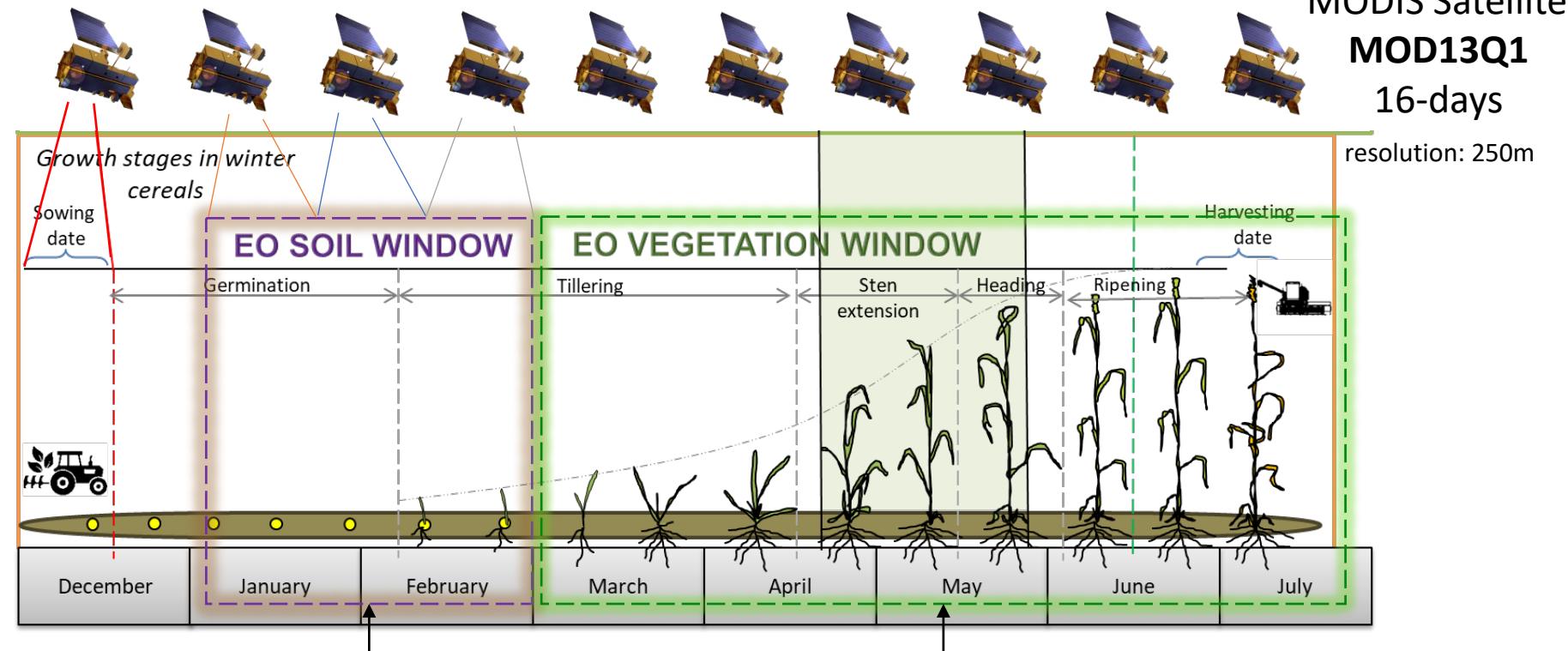


1

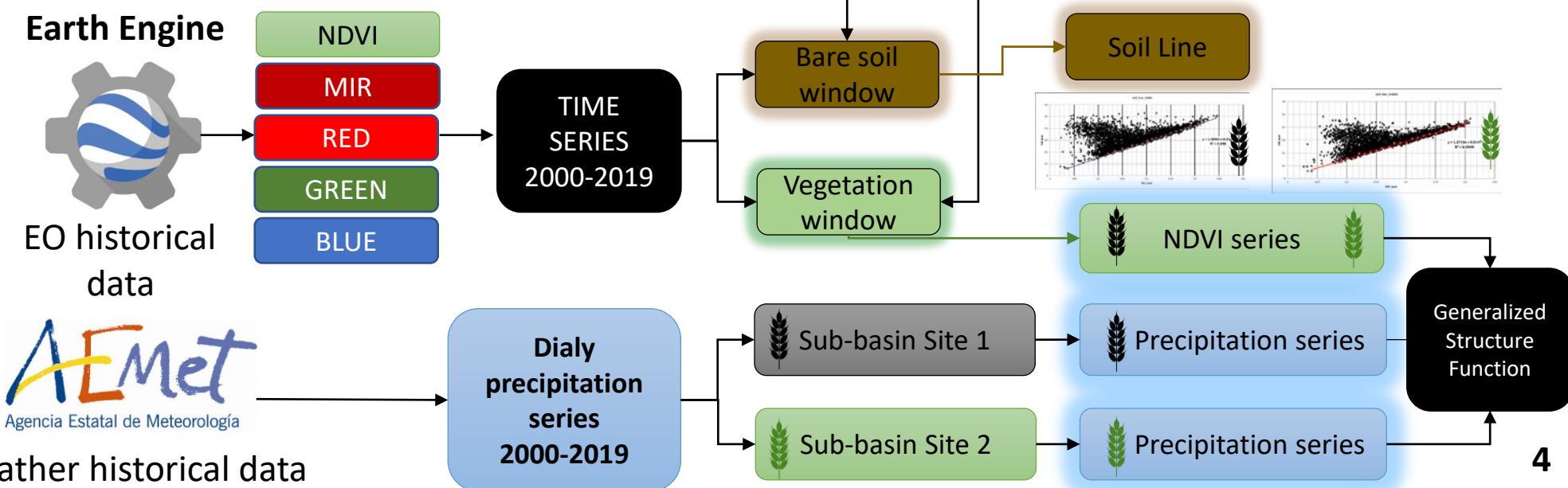
# The problem

Rainfed Cereal  
Yields

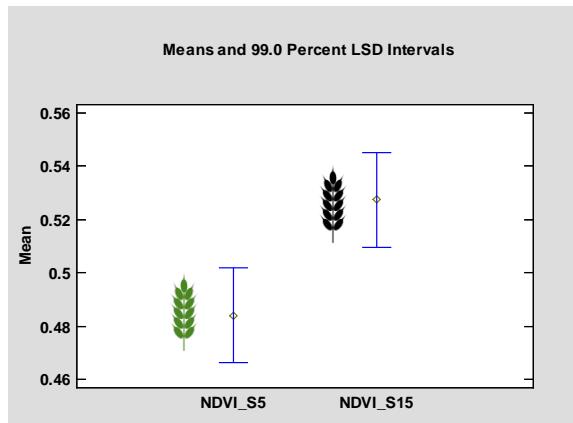
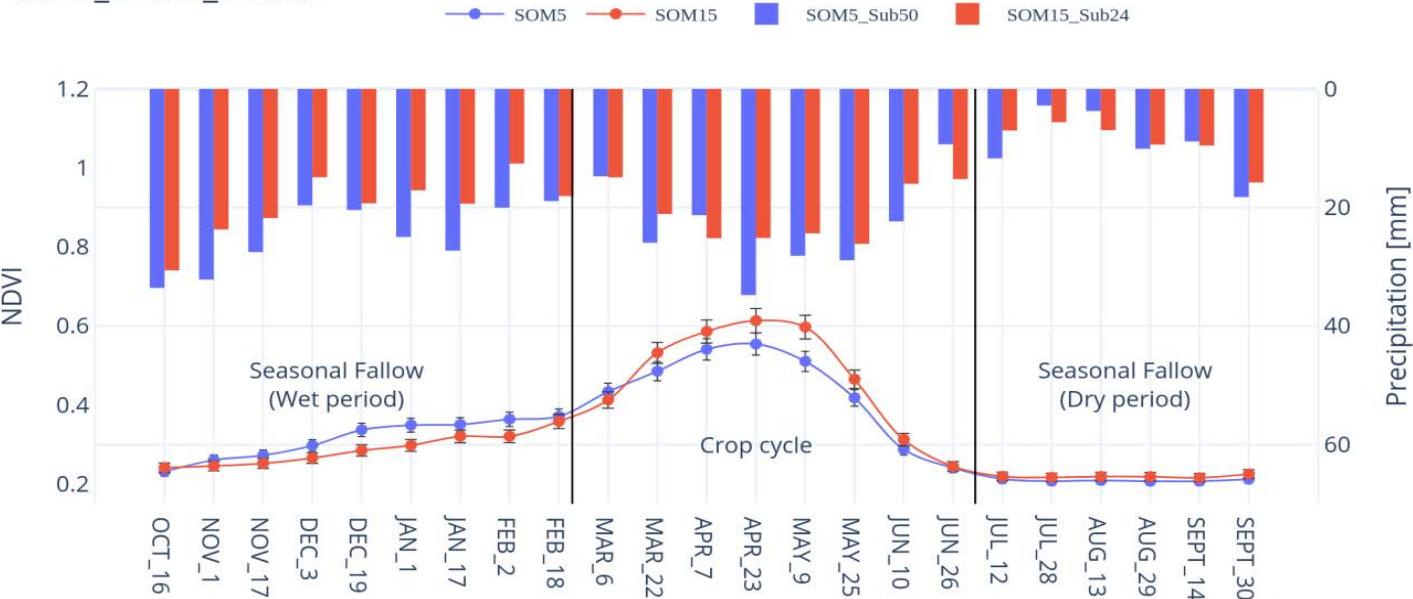




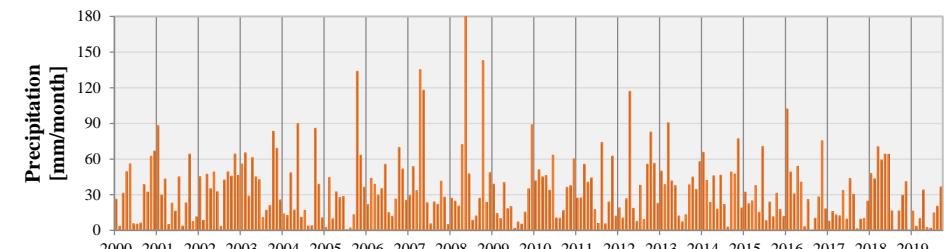
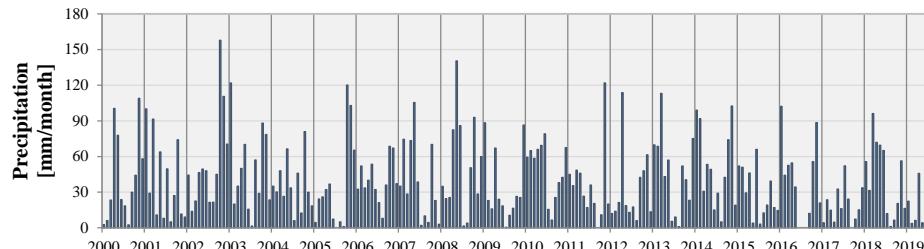
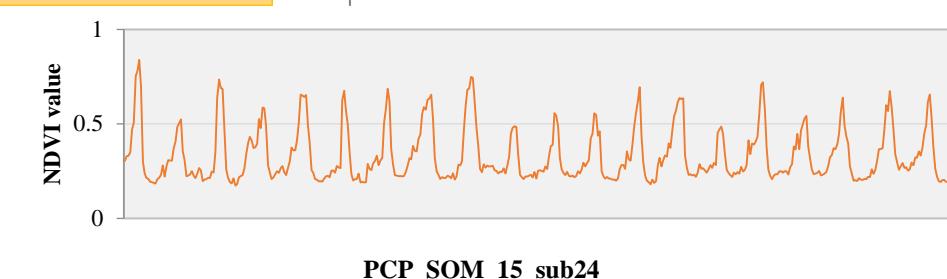
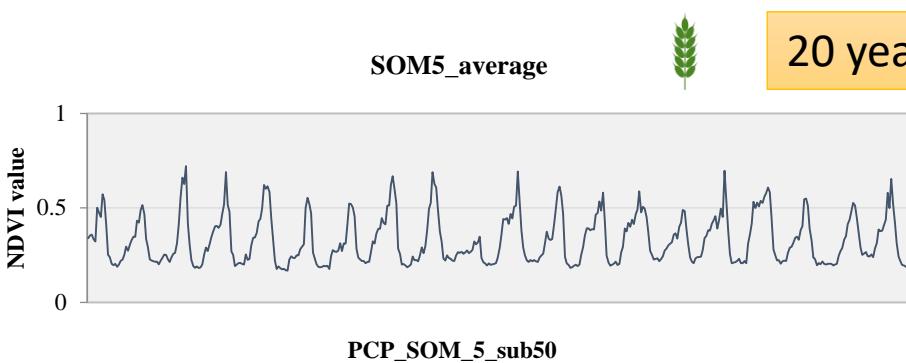
# Method



## NDVI\_SOM5\_SOM15

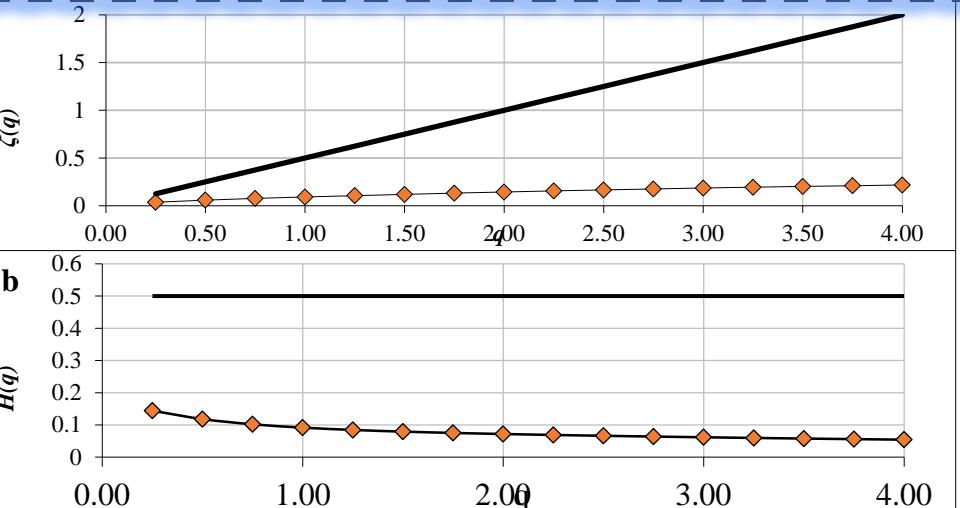


# Results (I)

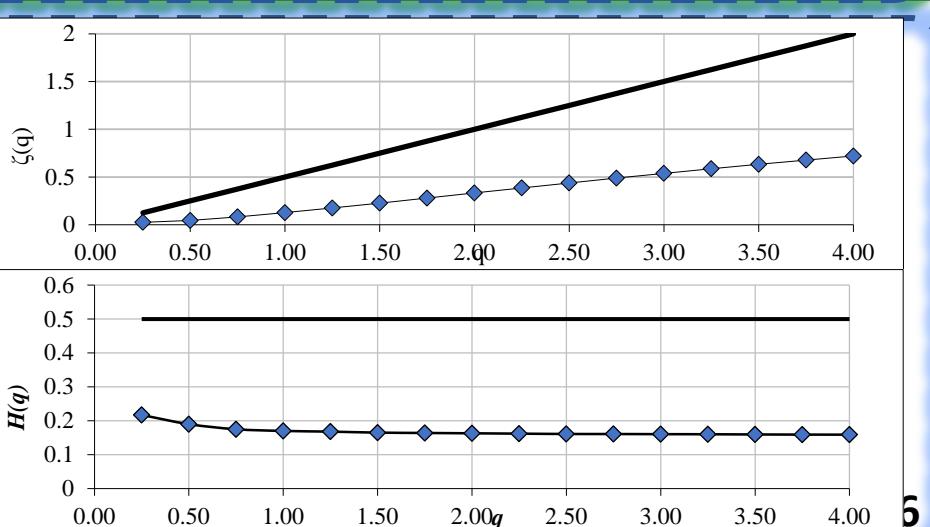
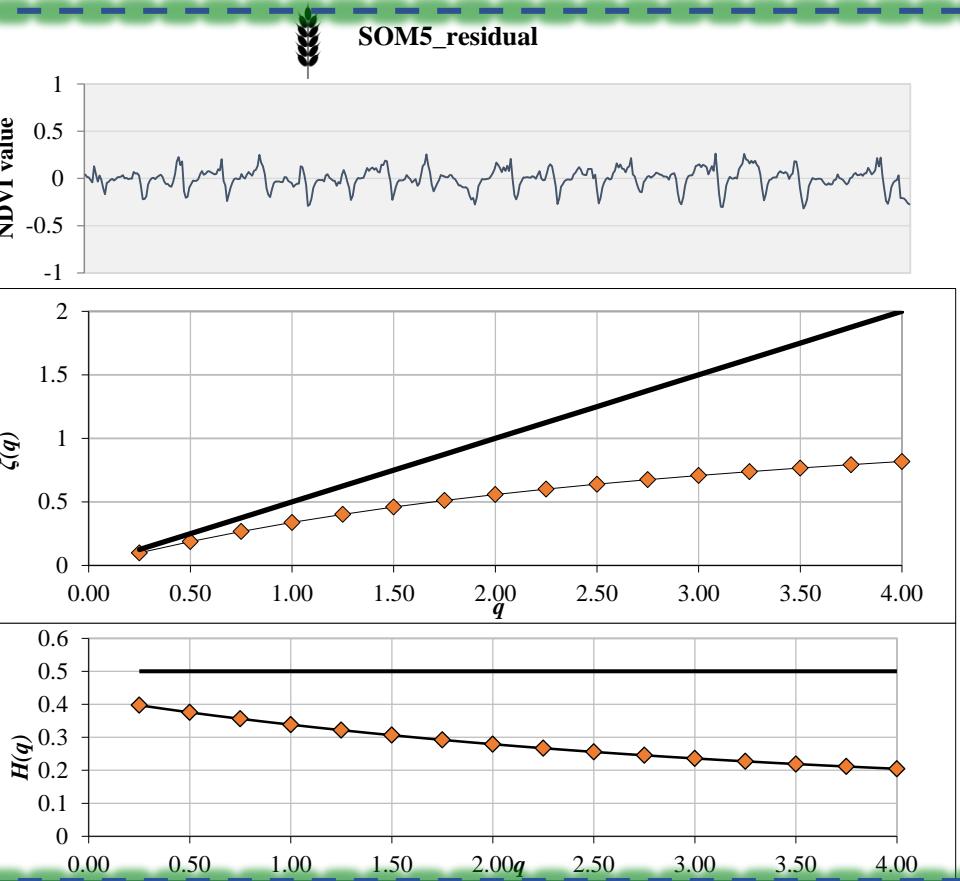


# Results (II)

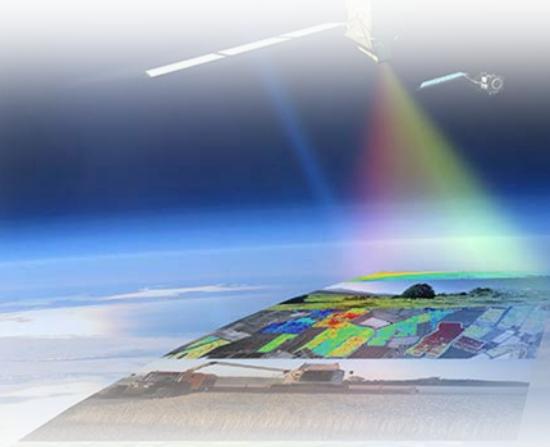
**GSF by Precipitation r.s.**



**GSF by NDVI residual series**



# Conclusions



The results presenting in this work reinforce the idea that the knowledge of soil properties and climate spatial variability is a key component to understand patterns of vegetation in large scales. The conclusions of this study are:

- I. Data from Earth Observation, in this case, MODIS satellite, through the soil reflectance differences validated the soil units from digital soil mapping approach with the Self-Organizing Map (SOM) algorithm. The main differences between the two areas are related to soil physical properties and the precipitation regime.
- II. The NDVI residual series under rainfed mono-crop activity in semiarid climate in the studied areas presented antipersistent structure; this is in majority due to antipersistent behaviour of precipitation residual series.
- III. Soil and atmosphere are dynamic systems varying with vegetation cover, underpinning the complex system measured through vegetation indices. For this reason, the use of soil units that recover multiple soil properties as SOM provides some insights for soil reflectance feedback to perform the understanding of NDVI antipersistent noise in rainfed crops.



*David Rivas-Tabares*



*Antonio Saa-Requejo*



*Juan J. Martín-Sotoca*



*Ana Maria Tarquis*

# Thanks!

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