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Droughts significantly impact both environmental and societal aspects, yet the **effects on ecosystems often remain underexamined**. We run an exploratory pilot to leverage satellite and hybrid data to explore drought impacts in Andalucía, Spain, highlighting the connection between environmental anomalies and drought conditions in Mediterranean landscapes using Google Earth Engine data.

POLICY FRAMEWORK



POLICY RELEVANCE

Notable research gap in environmental impacts of droughts

There is a predominant focus on socioeconomic effects due to their immediate relevance to human populations, but environmental impacts, particularly on ecosystems, are critical for the **long-term sustainability** of natural resources and societal well-being

Remote sensing can support assessment of environmental impacts

Remote sensing has been underutilized in analyzing these impacts, despite its potential to provide comprehensive and timely data due to the limited integration of advanced technologies in traditional monitoring strategies. It constitutes a crucial tool for developing **evidence-based policies** to effectively mitigate drought's impacts and enhance **resilience**.

MAIN TAKE-AWAYS

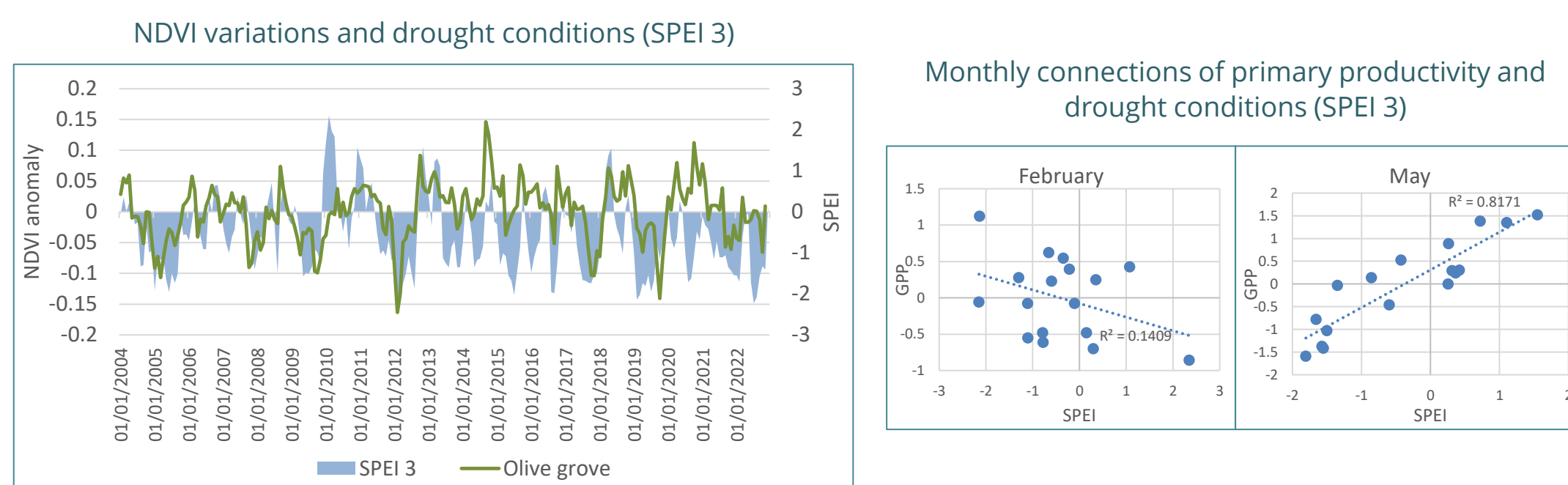
- Potential of Remote Sensing and modelled datasets:** they offer significant advantages in studying environmental impacts of droughts, providing real-time data on vegetation, land cover, and other variables.
- Useful Data Repositories and Platforms:** repositories such as Copernicus and Google Earth Engine (GEE) provide extensive datasets and analytical tools that enhance the capability to monitor and assess drought impacts globally.
- Variety of Satellite Resolutions:** the availability of satellites with varying resolutions allows for detailed and scalable analysis of drought effects.
- Connection between drought conditions and certain environmental variables:** these findings prompt further investigation, as there may be additional relationships between phenomena that are not always considered when tackling drought impacts.

Combining satellite imagery with modeled data enables a comprehensive understanding of drought impacts on ecosystems, which should also include a **ground-truthing process** with field data to validate the results. This would lead to a better-informed decision-making and policy development.

SPECIFIC INSIGHTS FROM OUR CASE STUDY (ANDALUCÍA)

VEGETATION

Vegetation shows a stronger correlation with drought conditions during periods of **high vegetative growth**, which suggests a higher predictability of impacts during these times.

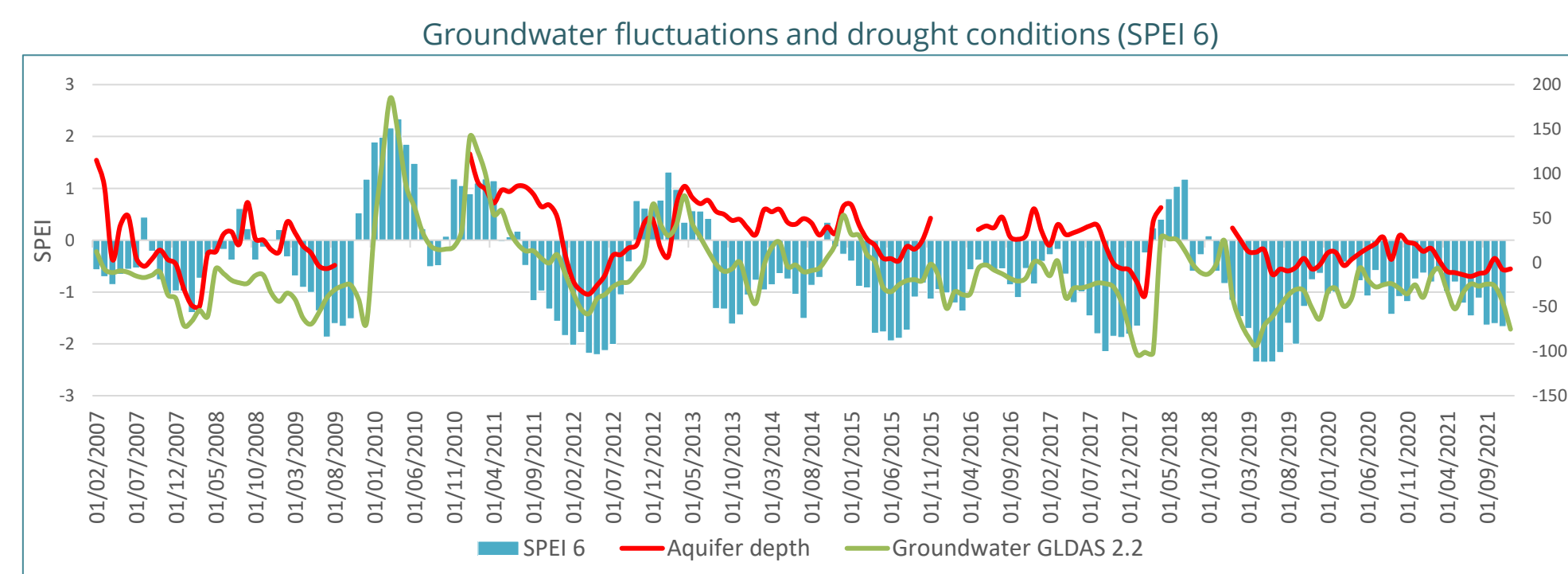


Environmental variables generally exhibit a stronger connection to short-term (seasonal) drought conditions, particularly those marked by **SPEI 3** and **SPEI 6**.

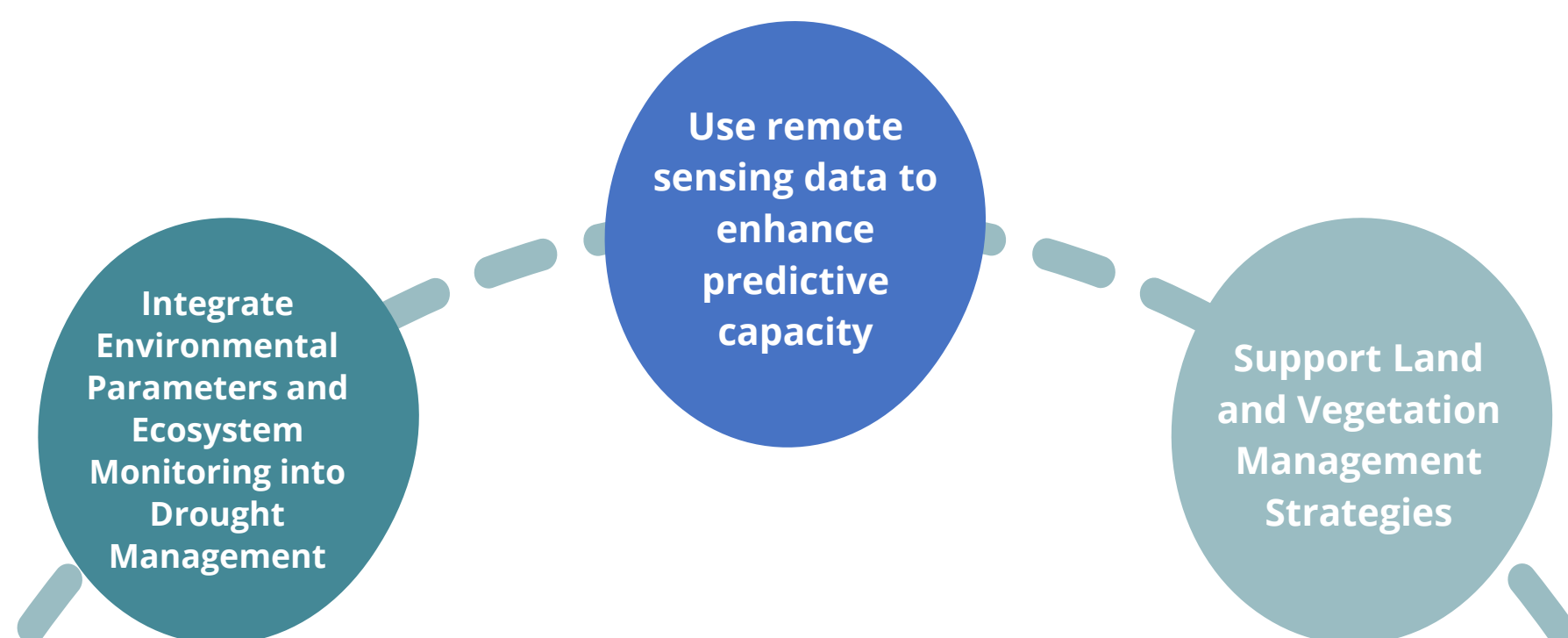
Grassland cover presents higher susceptibility to drought impacts due to its inherently seasonal nature.

GROUNDWATER

The **delayed response of groundwater** to drought conditions could be crucial for effective drought management and adaptation strategies, as these water bodies act as a buffer against the sudden propagation of droughts within the aquifer.



ACTIONABLE SOLUTIONS



METHODOLOGY

