

LONG TERM ECOLOGICAL RESEARCH SITES AS KEY INFRASTRUCTURES TO SUPPORT CLIMATE CHANGE ADAPTATION AND MITIGATION: THE LTER MONTADO EXAMPLE

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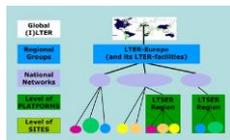


Motivation

Many ecological processes exhibit high inter annual variability and susceptibility to rare/episodic disturbance events, both impossible to detect based on short-term observations.

Origin

The Long Term Ecological Research (LTER) Network was created in the United States in 1980 to conduct research on ecological processes on a wide array of ecosystems at multiple geographical and time scales. This concept was extended to the rest of the world and today the International Long Term Ecological Research (ILTER) comprises 41 regional networks spread all over the five continents.



Mission

Long-term data sets from the LTER program provide a context to evaluate the nature and pace of ecological change, to interpret its effects, and to forecast the range of future biological responses to change. LTER's mission is to provide the scientific community, policy makers, and society with the knowledge and predictive understanding necessary to conserve, protect, and manage the nation's ecosystems, their biodiversity, and the services they provide.

LTER montado Site with 6 research and monitoring stations

Site	Dominant Oak Species	Main Land Use	Land Use Pressure	Vulnerability to dryness
Ribeira Abaixo	Cork Oak	Cork & Research	-	++
Mata de Sines	Cork Oak	Cork & Industry	+++	+
Contenda	Holm Oak	Game & Acorns	++	+++
Coitadinha	Holm Oak	Eco-tourism	+	+++
Machuqueira	Cork Oak	Cork	+	+
Comp. Lezírias	Cork Oak	Cork & Cattle	++	+

Ecological relevance of montado

- Unique agro-silvo-pastoral system shaped by man over millennia combining multiple uses in a single space: forestry, extensive livestock husbandry, hunting, eco-tourism...
- High Nature Value Farmland, Habitats Directive, part of the Mediterranean biodiversity hotspot
- Ecosystem services provider: carbon storage, water regulation, biodiversity, aesthetic value, sense of place ...
- Pressures and drivers of change** - Rural abandonment, tree mortality, depreciation of cork market value, overgrazing and climate change as the main

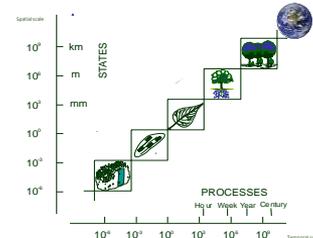
Socio – economical relevance of montado

- Large geographical extent
 - 'Marginal' areas with limited agricultural potential
 - Multi-use in a single space
 - Rural sustainable living
 - Traditional management practices knowledge
 - Employment supply (half the world's output of commercial cork and major producer of non-timber forest products)
- 6000 seasonal jobs in cork oak *montado*
15000 workers in 900 cork transforming industries
850 M€ cork exportations in 2012

LTER montado Research questions

- Response to local-scale pressures** - Which causal mechanisms alter the function of the *montado* and its ability to maintain the provision of ecosystem services under site-specific management regimes?
- Monitoring of large-scale key drivers of change** - Which are the key climatic and environmental factors of the *montado* vulnerability?
- Socio-economical drivers of change and participatory social processes** - How do the socio-economic context and institutional setting affect the long-term sustainability of the *montado*? How *montado* stakeholders use and value ecosystems services?

- Site-specific approach (e.g. biodiversity patterns under different land use regimes)
- Cross-sites approach (e.g. vulnerability to dryness, grazing intensity)
- Regional approach (e.g. transdisciplinary analysis of values and uses of montado)



The **LTER Montado** site is a key infrastructure of national relevance and privileged platform for research on the effects of global change in one of the most important Portuguese forest assets, covering the entire southern part of the country, and essential for the livelihood of thousands of people that depend on this High Nature Value Farmland. Its long term, fully shared, datasets represent a major supporting tool for the scientific community but also for the decision makers, to design and implement of mitigation and/or adaptation measures, namely to climate change