

SESSION: SSS12.7

Current Debates on Land Degradation
and Development

Co-organized by EOS7

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Palynology as a tool for the knowledge on the millennial human impact and land management in the central Mediterranean

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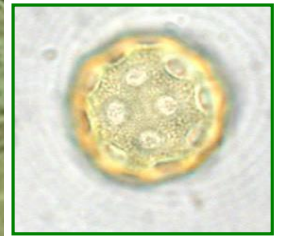


- ✓ **Palynology and Cultural Landscape**
- ✓ **Long-Term Environmental Change (LoTEC)**
- ✓ **The LoTEC becomes Cultural Landscape**
- ✓ **Influence or Impact?**
 - ✓ 1. Multifunctional land-use in Mediterranean prehistory
 - ✓ 2. Landscape and human activity at Stromboli, Sicily
 - ✓ 3. Pastures and crops of Greek colonies in southern Italy
 - ✓ 4. Agriculture and local economies of Roman central Italy
- ✓ **Conclusions**

Human impact and land management can be studied by palynology

- *marine / continental cores*
- *archaeological sites*

From natural to cultural landscape



The millennial scale of these phenomena as Long-Term Environmental Change (LoTEC)

The LoTEC studies successions from undisturbed to anthropogenically influenced environment (Faegri et al 1989)

Interdisciplinary *a-b-g* applications

Palaeoecology / Ecology

Conservation biology

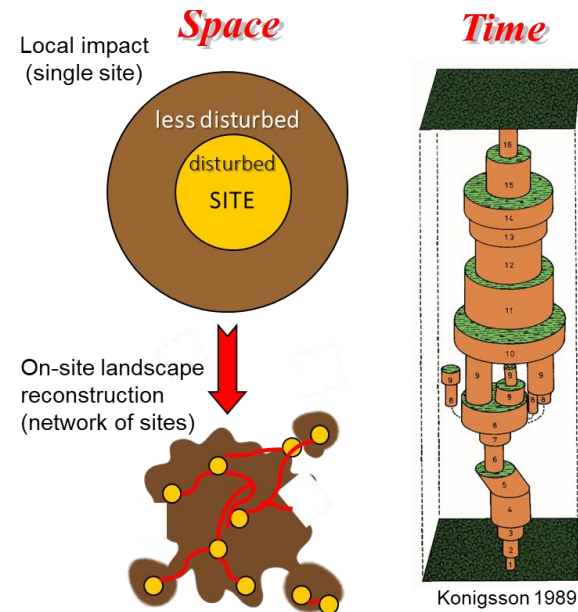
Landscape reconstructions

Land-use management

The understanding of LoTEC implies

knowledge and description of environments at subsequent steps of human impact

knowledge on the scale and duration of human presence in a territory



Sustainability 2019, 11(2)

Special Issue: The Long-Term Perspective of Human Impact on Landscape for Environmental Change (LoTEC) and Sustainability (Mercuri AM & Florenzano A eds)

The LoTEC becomes Cultural Landscape

The 3-concept definition of Cultural Landscape

by Mulk and Bayliss-Smith (1998)

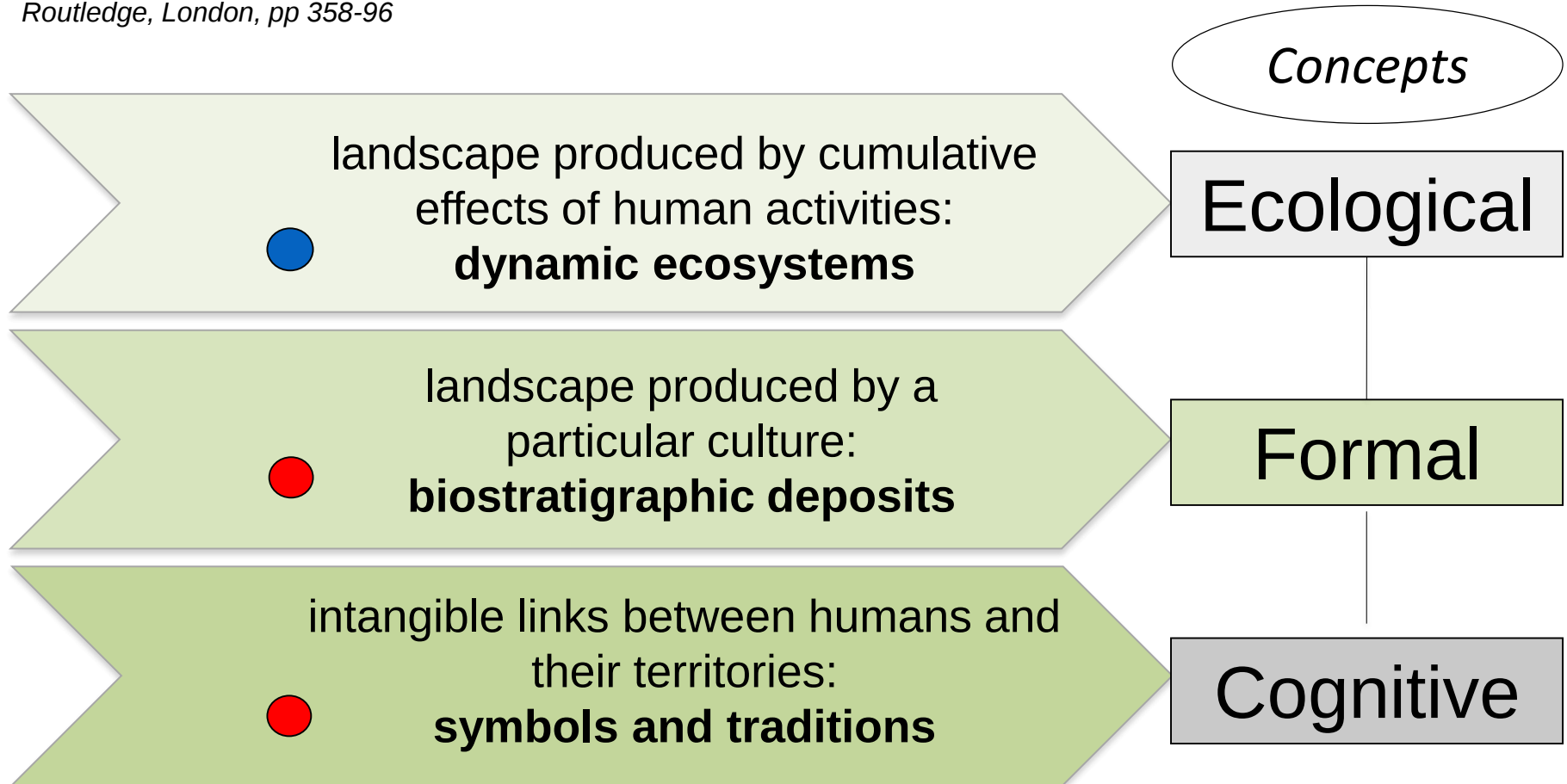
In: Ucko PJ, Layton R (eds)

The Archaeology and Anthropology of Landscape.

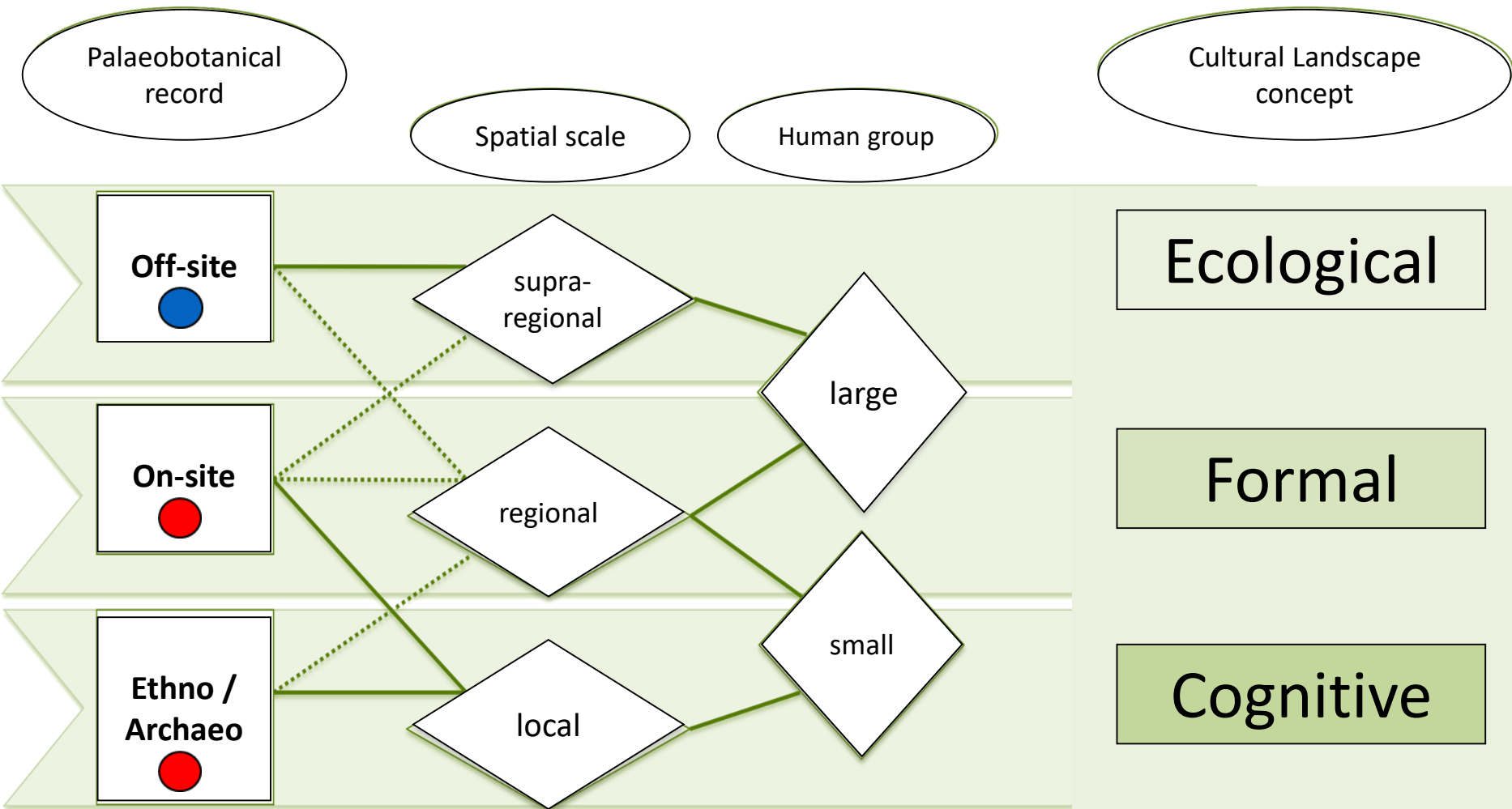
Routledge, London, pp 358-96

● *marine / continental cores*

● *archaeological sites*

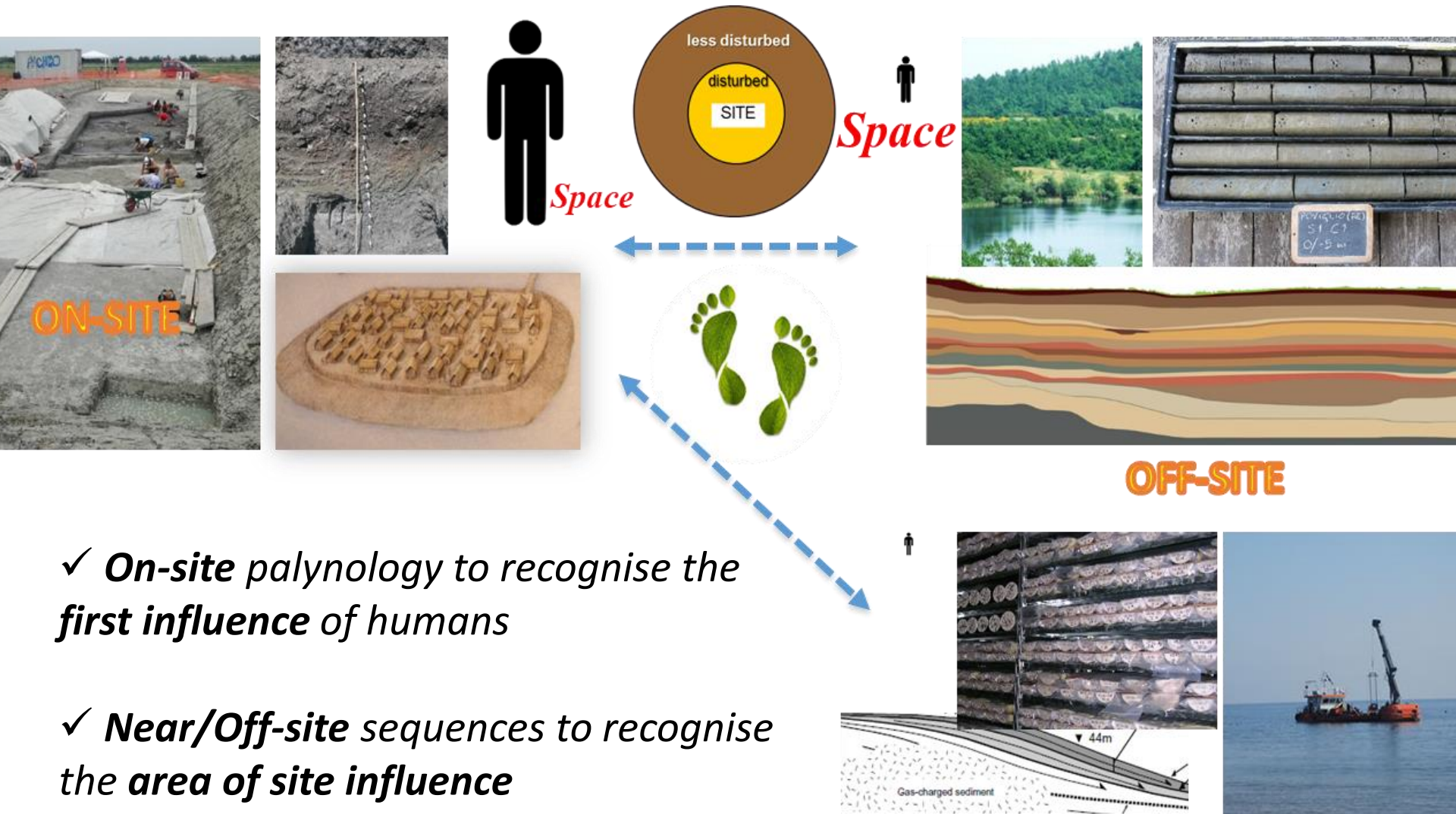


- ✓ *human ecosystems **replace** natural ecosystems*
- ✓ *cultural landscapes are the lands **transformed** by human impact*



Influence or impact?

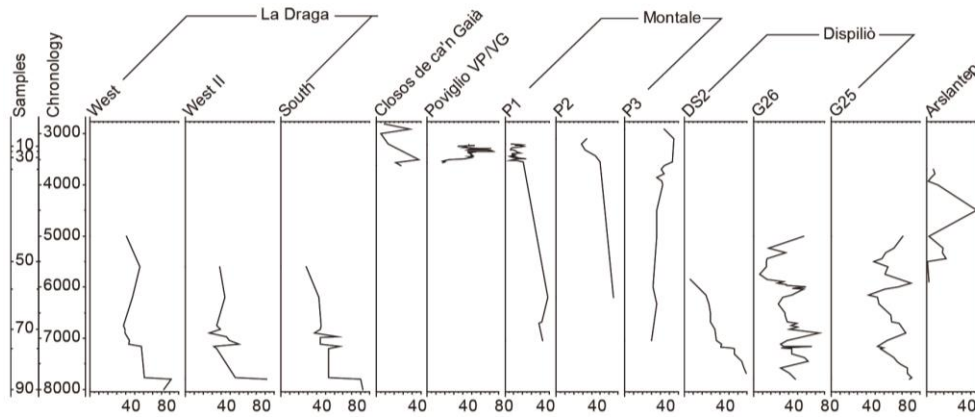
Comparison of regional (natural?) and local (disturbed) pollen diagrams



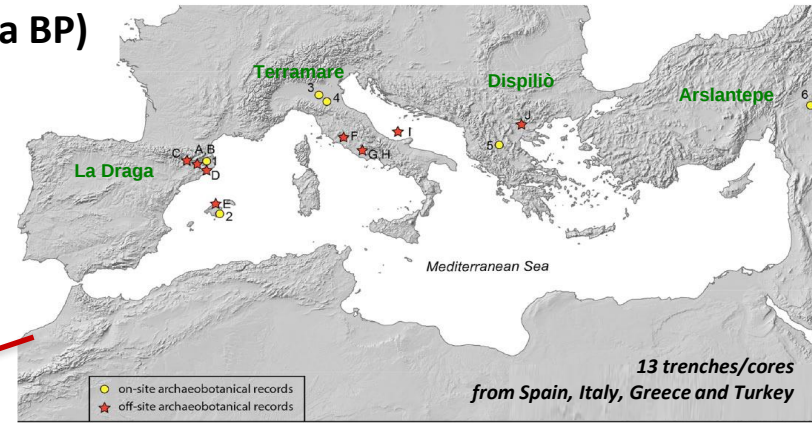
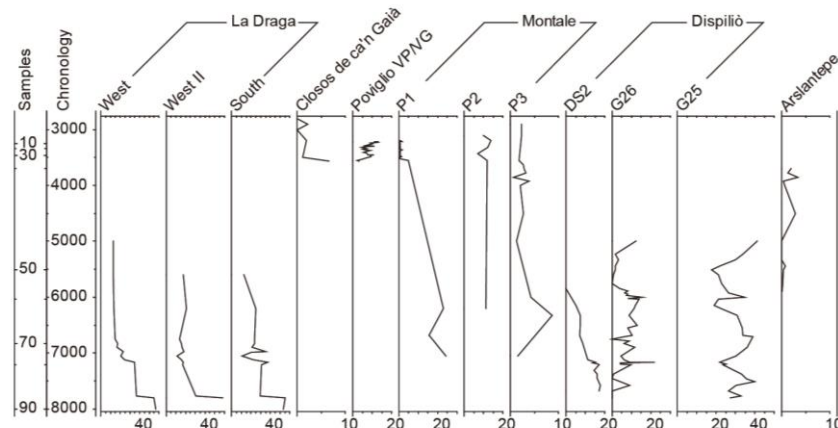
1. From influence to impact (8.0-2.8 ka BP)

Palynology of prehistoric Mediterranean archaeological sites shows a **multifunctional land use** (Mercuri et al 2019)

ARBOREAL POLLEN (%)



QUERCUS (%)



90 time slots from c. 8000 to 2800 cal yr. BP were established on the basis of radiocarbon dates, stratigraphy-sedimentation rate and cultural attributions of the layers of each site. One time slot includes samples with a similar age from different sites



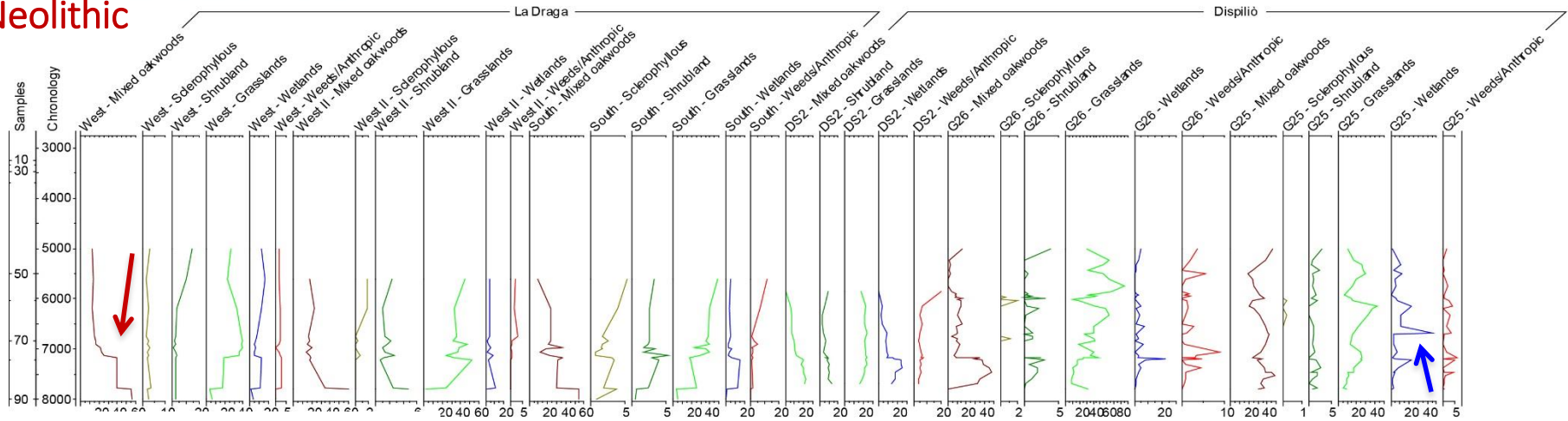
Neolithic/Bronze: an increasing importance to **wood exploitation** seems to have occurred over time, that was probably the main cultural change at the passage from the Neolithic land-use (*influence*) to the Bronze age land exploitation (*impact*).

Similar general patterns:

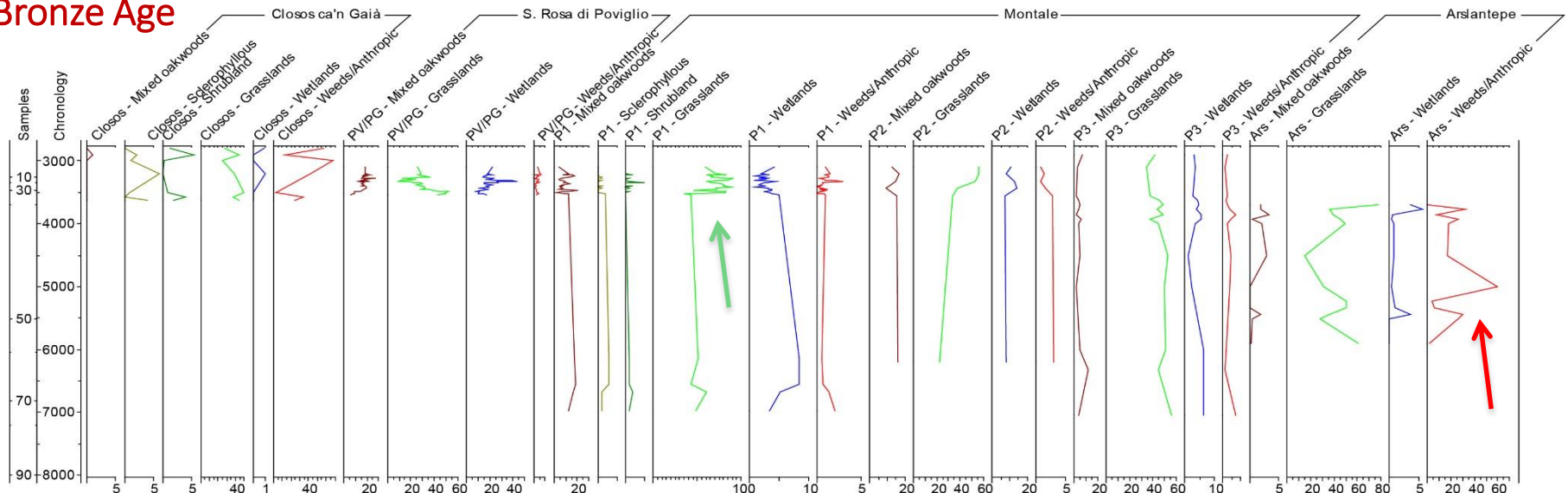
- (1) declines of trees at the onset of settlement (especially oaks)
- (2) alternative cycles of retreat and recovery of woodland
- (3) trends of decrease of woodland cover just before the abandonment

All the sites were settled near **wet environments**, surrounded by **grasslands** and mixed **oakwoods**, with many **synanthropic** taxa

Neolithic



Bronze Age



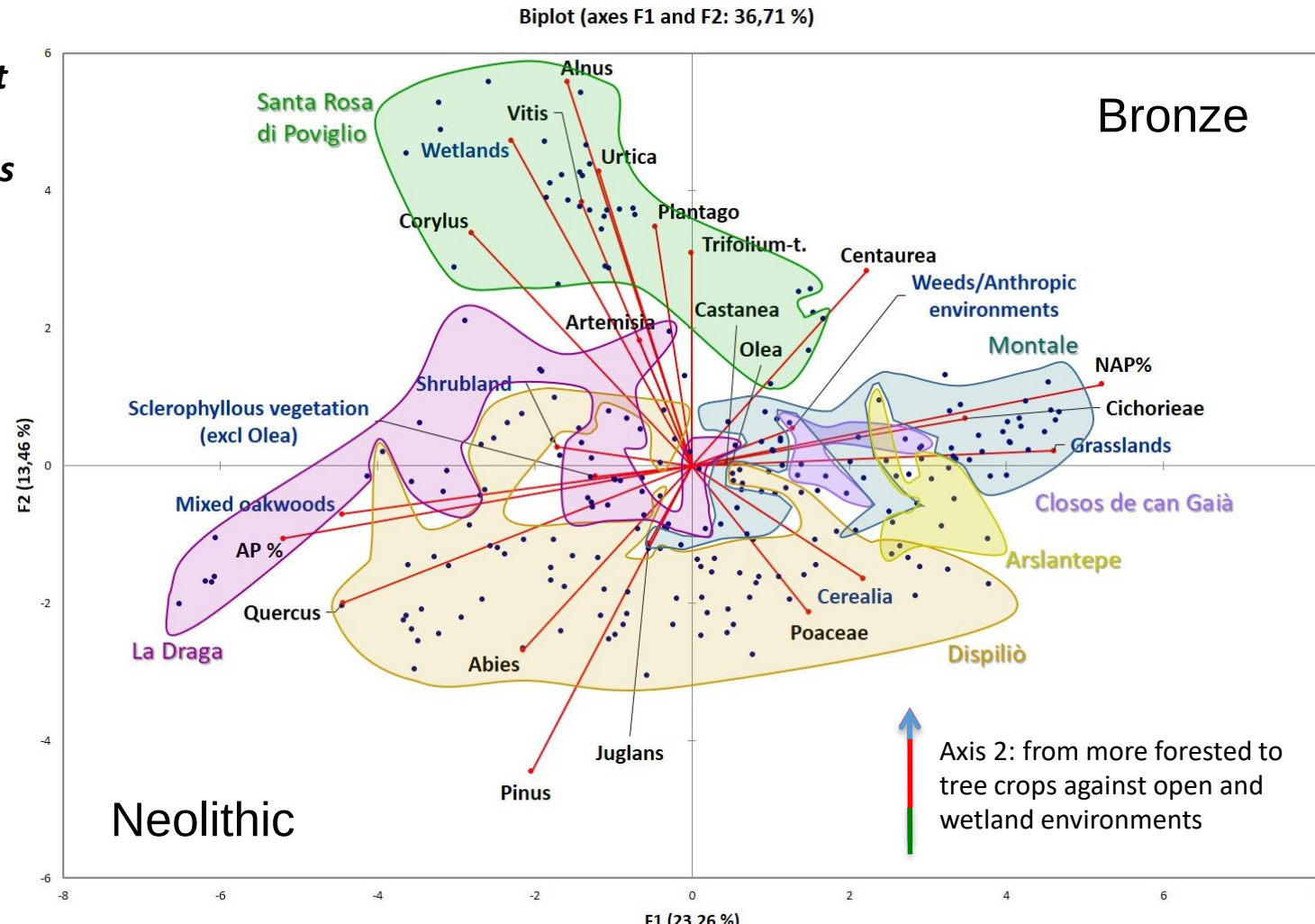
- Sylvopastoral and crop farming mixed systems
- Neolithic and Bronze different focuses on land uses and cultural skills
- increasing importance given to wood exploitation over time

multifunctional land use

Principal Component Analysis of selected pollen taxa and sums from the 6 archaeological sites

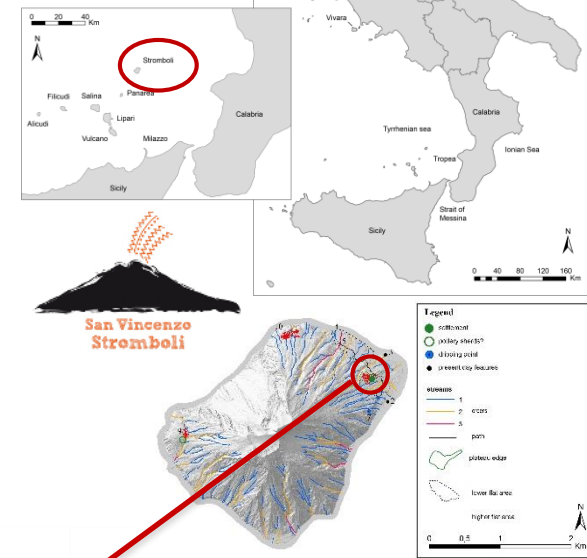


Axis 1 : from forested towards more open environments, and from tree crops to herb crops and grassland



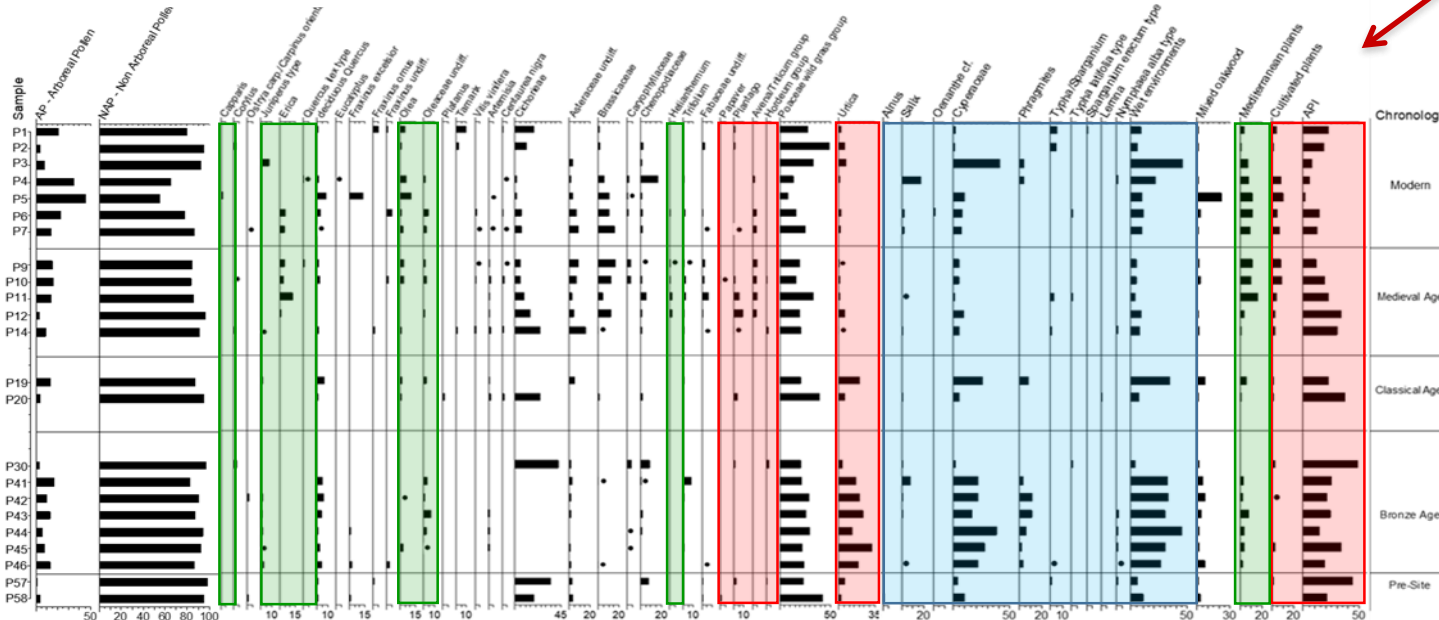
2. Landscape and human activity at Stromboli, Sicily (Bronze Age - Medieval phases)

Interdisciplinary approach for the diachronical reconstruction of environmental changes and agrarian practices in a volcanic island (Mercuri et al 2020)



San Vincenzo-Stromboli Mediterranean plants anthropic wetlands

Bronze age site of San Vincenzo. 60 pollen samples, and 1/3 had enough pollen to calculate pollen spectra (pollen is the only botanical remain preserved)



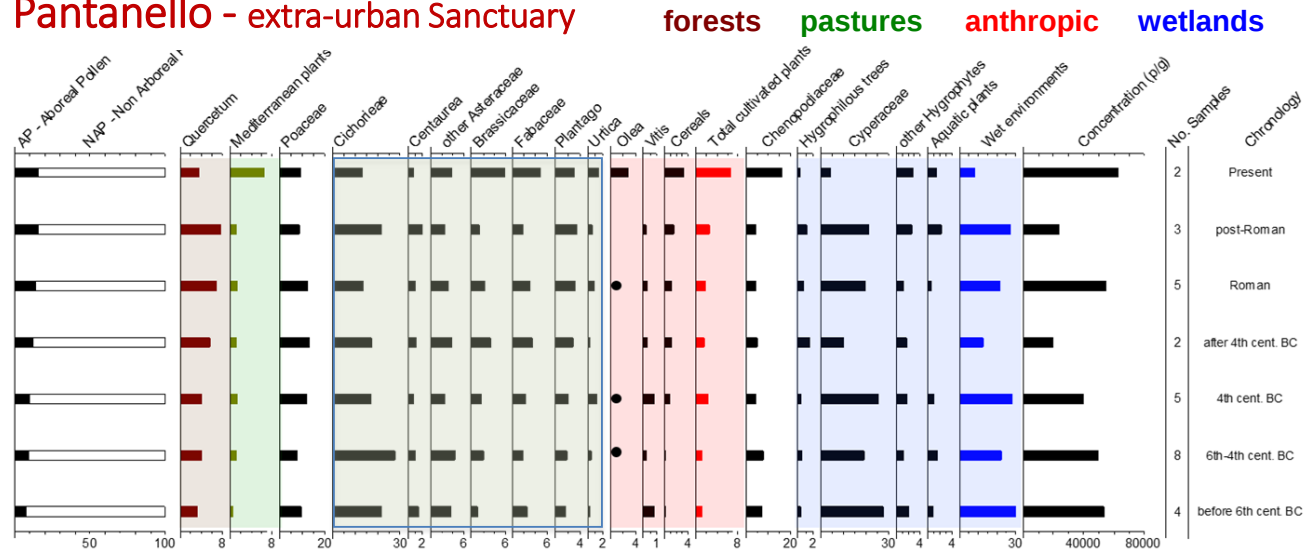
Early evidence of agrarian practices, including cereal cultivation, dates back to the Bronze Age while the current vegetation seems to have originated during the Medieval period.

3. Pastures and crops of Greek colonies in southern Italy (Chora of Metaponto, 6th-1st BC)

<https://liberalarts.utexas.edu/ica/projects/metaponto/introduction.php>

Reconstruction of the agrarian landscape on which was based the economy of the Greek colonial system at Metaponto (Florenzano & Mercuri 2012, 2018)

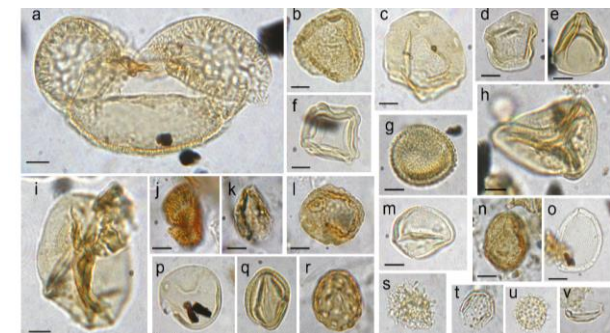
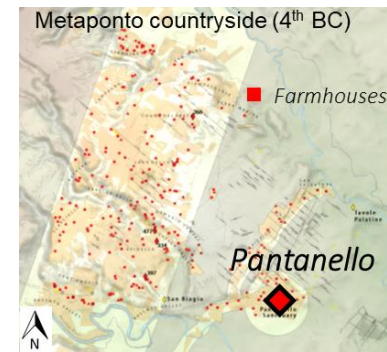
Pantanello - extra-urban Sanctuary



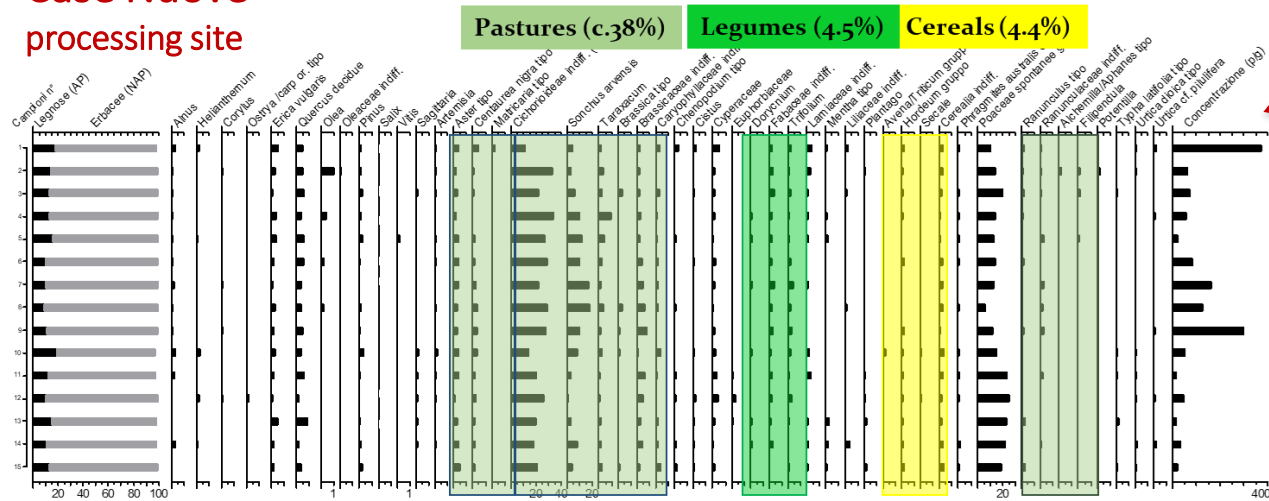
Economy was prevalently based on crop (**cereals**) and tree (**olives**) cultivation and **pastoralism** or animal breeding; agriculture was performed just close to the settlements.



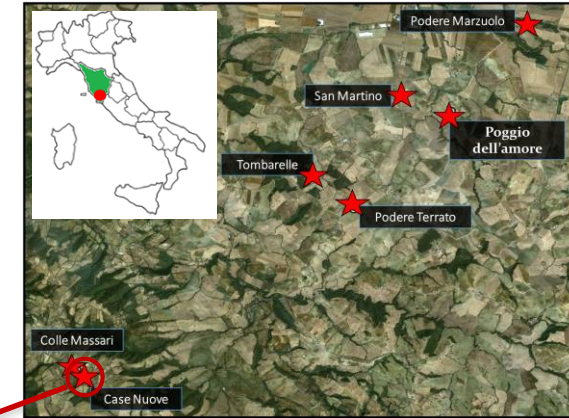
4 rural sites in the countryside of Metaponto.
90 pollen samples



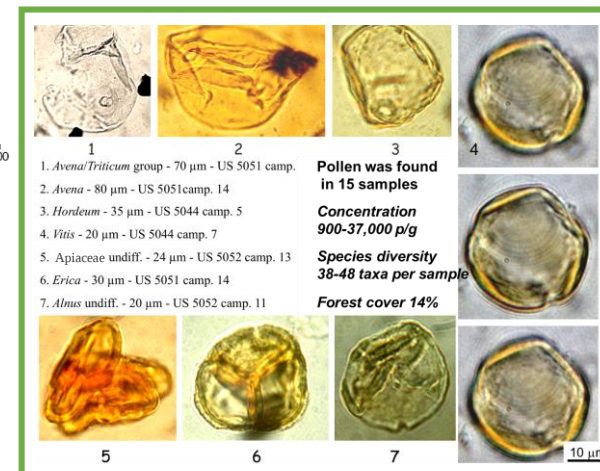
Case Nuove processing site



Roman sites were built in patches of **fields and pastures** simultaneously present in the territory intensively exploited and managed by farmers and peasant people.



7 archaeological sites (rural settlements and temporary use structures) in the Ombrone river valley.
87 pollen samples and 84 macroremain samples taken from different contexts



Conclusions

Human impact and land management are studied by palynology as **LoTEC** and researches on the transition from **influence to impact**.



- ✓ **Central Mediterranean** ➤ Multiple land use activities (**multifunctional landscapes**) since the Neolithic
- ✓ **Stromboli island** ➤ Environmental reconstruction pointing to the **availability of resources** in a limited space; current Mediterranean landscape since the Middle Ages
- ✓ **Greek colonies in S Italy** ➤ **Complex agro-pastoral system** instead of monoculture cropping in the *chora*-countryside
- ✓ **Roman central Italy** ➤ Signals of great human control over productive landscapes; seasonality of agrarian activities and **dynamic production system**

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