Climate Change and social transformations in the past (12ka BP): from field data acquisition towards socio-ecological modeling

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To cite this version:
Laurent Lespez, Maria-Angela Bassetti, Jean-François Berger, Jean-Michel Carozza, Laurent Carozza, et al.. Climate Change and social transformations in the past (12ka BP): from field data acquisition towards socio-ecological modeling. Conférence MISTRALS PALEOMEX, Oct 2017, Montpellier, France. 2016. hal-01683548

HAL Id: hal-01683548
https://hal-univ-tlse2.archives-ouvertes.fr/hal-01683548
Submitted on 18 Jan 2018

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Climate Change and social transformations in the past (12ka BP): from field data acquisition towards socio-ecological modeling

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Objectives and challenges

ÅClimatic trends in Mediterranean areas during the Holocene (from 12 ka BP)
ÅDefinition of the spatial and temporal variability of the Rapid Climate Changes (RCCs)
⇒ Climate change and impact on cultural and political dynamic?

- Neolithic (9.2, 8.2 and 6-5 ka BP)
- Bronze Age (4.2 ka cal BP)
- Final Bronze Age and Historical periods (3.2-2.8 and 1.3 et 0.7 ka cal BP)

Methods: 4 transsects – multiproxies analyses

- Long marine sequences....
- Analyses of high resolution climate changes analyses
- Analyses of high resolution lakes and fluvial sequences
- Socio-political changes: cultural areas, settlement, political changes

Paleoxem in the Lion's Gulf

Improve climate and environmental change: seesaw across the Mediterranean basin

Conceptual model of Climate/Environment/Society interactions

4.2 ka BP climatic event and settlement pattern changes from the Late Neolithic to the Early Bronze Age in western Mediterranean:
- Effects of RCC lasting 3-4 centuries around the 4.2 ka BP event. c. 2.2-2.0 ka BC recorded in the lake, fluvial and soil systems.
- A temporal imprint structure with 2 wet periods in Southern France.
- Change in the human settlement system around 2.2-2.0 ka BC.
- In lowland areas, the number of settlements decreases significantly along the river systems during a period of very high hydrosedimentary discharges, dryness, and fire activity.
- Environmental changes (agricultural retreat) permitted the exploitation of coppice resources on high altitudes of about 2,400 m allowed for an exploitation of alpine copper as in Saint-Victor (SE France) and archaeological finders. New revealed a growth in human pressure in mountain areas, specifically in the Pyrenees (SW France).
- Change of settlement from lowland area to mountainous areas may have resulted in a societal reorganization at a regional level, but not in a global societal collapse.

Modelling Climate/Environment/Society interactions

Dynamic and spatially explicit modelling is the only way for combining palaeo-environmental data such as in Palaeo, lake and sediment cores, with archaeologically and socio-ecological transition history-based hypotheses in the functioning of the Neolithic societies.

Anchors:
Å Paleo-environmentalists provide climate and landscape reconstructions with a century-scale temporal precision whereas, to understand the consequences on rural populations, one should translate these data into socio-economic and human learning processes.
Å Archaeologists provide site-specific, habitat and activity descriptions for specific time periods whereas, to extend such reconstructions for analyzing at a regional level, the site occupied by the same culture, a generic and adaptable behavior rationality should be hypothesized, favoring common surrounding rules and production practices.

References:

Laurent Lespez was a co-author of the Climate of the Past Special Issue Climate of the Past Special Issue: Rapid Climate Events of the Last 12,000 Years. (2015). Climate of the Past, 11, 495-403
