Climate Change and social transformations in the past (12ka BP): from field data acquisition towards socio-ecological modeling
Laurent Lespez, Maria-Angela Bassetti, Jean-françois Berger, Jean-Michel Carozza, Laurent Carozza, Nathalie Combournie Nebout, Laurent Dezileau, Arthur Glais, Matthieu Ghilardi, Catherine Kuzucuoglu, et al.

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

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L’archive ouverte pluridisciplinaire HAL, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d’enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.
Climate Change and social transformations in the past (12ka BP): from field data acquisition towards socio-ecological modeling

Laurent Lespérat, Maria-Angela Bassetti, Jean-François Berger, Jean-Michel Carozza, Laurent Carozza, Nathalie Combrouve-Nebout, Laurent Dezileau, Arthur Glais, Matthieu Ghilardi, Catherine Kuzuzoglu, Didier Peyron, Pierre Sabatier, Mehdi Saqqal, Boris Vannière, Marie-Alexandrine Sicre, Bassem Sibali

Objectives and challenges

- Climatic trends in Mediterranean areas during the Holocene (from 12 ka BP)
- Definition of the spatial and temporal variability of the Rapid Climate Changes (RCCs)
- Climate change and impact on cultural and political dynamics?
- 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 transects – multiproxies analyses

- Long marine sequences....
- Analyses of high pollen and fire signature series for high resolution climate changes analyses (e.g. modern analogue) - Peyron et al. (2015; Vannière et al. 2016)
- High resolution analyses of lake and fluvial sequences (e.g. 8.2 impregnation in Berger et al. 2016)
- Socio-political changes: cultural areas, settlement, political changes (e.g. Carozza et al., 2015; Lesperat et al., 2016a, b)

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 imbricate structure with 2 wet periods in Southern France
- Changes in the human settlement system around 2.2-2.0 ka BC.
- In lowland areas, the number of settlements decreased significantly along the river systems during a period of very high hydrosedimentary discharges, dryness, and fire activity.
- Environmental changes (glacial retreats) permitted the exploration of copper ore reservoirs (high altitudes of about 2,400 m) allowed for an exploitation of alpine copper as in Saites-Saintes (G France) and archaeological findings. New revealed a growth in human pressure in mountain areas, specifically in the Pyrenees (S France).
- Change of settlement from lowland 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 modeling is the only way for combining spatially explicit simulations (e.g. P.-A. Joly, see contribution) and field surveys, with archaeological data and socio-ecological history to test hypotheses in the functioning of the Neolithic societies.

Assumptions:
- Paleo-environmentalists provide climate and landscape reconstitutions with a century-scale temporal resolution whereas, to understand the consequences on rural populations, one should translate these data into possible local variations in human activities.
- Archaeologists provide site-specific habitat and activity descriptions for specific time periods whereas, to extend such reconstitutions to spatial analyses, a generic and adaptable behavior rationality should be hypothesized, allowing same socio-economic rules and production practices.

Reference: