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

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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

- 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)
- → Climatic change and impact on cultural and political dynamics?

Methods: 4 transects – multiproxy analyses

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 (e.g. around 4.2 ka BP recorded in the lake, fluvial and soil records)
- A temporal landscape structure with 2 wet periods in Southern France
- Change in the human settlement system around 4.2-2.2 ka BP
- 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 retreat) permitted the exploitation of copper and minerals (e.g. high altitudes of up to 2,400 m) allowed for an exploitation of alpine copper, as in Saint-Vaast (Pas de Calais) and archaeological findings have revealed a growth in human pressure on mountain areas, specifically in the Pyrenees (34 km²)
- Change of settlement from lowland area to mountainous areas may have resulted in a spatial reorganization at a regional level, but not in a global collapse.

References:


We propose a spatially explicit agent-based and temporally defined (scale-specific) meso-agent modelling.

The GAMA platform (gama-platform.org) built in NetLogo (Pernici Jr, 2016) is the software reference for such simulation and long-term modelling process.