

## **Impact of past land-cover on the dynamics of ecosystem services and plant diversity over the past 200 years (Pyrenees, France)**

**Florence Mazier**

UMR 5602 CNRS Department of Environmental Geography,  
Toulouse Jean Jaurès University, France

Mountains provide various ecosystem services (ES) through their diverse habitats and associated functions. These ES are impacted by ongoing land-cover changes in addition to climate change, and therefore vary over time. Taking into account their historical trajectory over the long-term is necessary to understand both the current and future provision of ES and modern plant diversity. The potential of paleoecology is highly acknowledged to address specific conservation issues by providing long-term records of land-use and vegetation changes and their impact on the dynamic diversity of flora, the production of ecosystem services and the multifunctionality of mountain pastures. The Bassiès valley (eastern Pyrenees) is representative of the Pyrenean scenario where pastoral activities have reached a particularly low level, and where recent reforestation has been observed. This talk focus on i) the open-land history of this mountainous area and examines the local variability of land-cover history and the spatial patterning of vegetation over the last 200 years based on pollen records from eight lakes and bogs sediments; ii) the production of continuous fine-scale land-cover maps of eight land-cover types at 10 to 20-year intervals, iii) to explore the impact of pastoral activities on past land-cover composition and configuration, iv) the land-cover legacy effects on modern plant taxonomic and functional diversity, v) ES trajectories in relation to past land cover.

## **Pedoanthracology sheds light the ancientness of the pastoral highlands of three mediterranean mountain: Sierra de Gredos (Spain), southeast Massif Central (France), and northern Apennines (Italy).**

**Marie-Claude Bal**

Lecturer - Geographer – University of Limoges  
Deputy Director of the GEODE UMR/CNRS 5602 laboratory

The Mediterranean mountain zone is probably one of the parts of the world with the longest documented history of interactions between vegetation, climate, and human activities. The twofold objective of the present study was to examine and compare changes in three silvopastoral mountain areas, and to identify the natural and human processes that have shaped today's mountain landscapes. Although there were differences in vegetation and history between the three areas, there were also similarities in agropastoral practices, including livestock pressure and the use of fire. These similarities were supported by strong evidence based on soil charcoal and complemented by multiple other proxies (i.e., pollen analysis, archeology, historical documentation, and climatic data). The processes that led to the current physiognomy of the landscapes took place over the previous millennium, with a degree of synchrony over the past 500–800 years. The long co-evolution of humanity and landscape led us to reflect on the legacy of previous human practices and climatic changes, in terms of the composition of modern forests and the sensitivity of certain arboreal taxa (*Pinus gr. sylvestris*, *Abies alba* and *Taxus baccata*) that declined or disappeared during the late Holocene when the rates of vegetation change accelerated markedly. In summary, the comparative study of the history of the three highland landscapes attests to the interaction between long-term human impact (mainly pastoral societies, including livestock pressure and use of fire) and protracted climatic episodes that led to common changes in the study areas.