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The combination of climate and land use changes has triggered important land cover changes in European mountains over the last 50 years. These changes may accelerate with climate change in the 21st century. The linkages between vegetation dynamics and primary productivity of mountain ecosystems and their ability to mitigate carbon emissions are still poorly understood. The purpose of the **CAMELEON project** is to **improve our knowledge of the carbon cycling of mountain ecosystems**. The key objectives is (i) to **understand how land use changes translate into plant functional diversity changes** (ii) to **model the carbon cycling in mountain ecosystems at the landscape scale using detailed accounts on climate forcing and plant functional diversity** (iii) to **forecast the potential changes in the carbon stocks and fluxes in mountain ecosystems**.

Our project targets **three long-term mountain research areas located in Eastern Pyrenees (Spain), South-Western Alps (France) and Eastern Alps (Austria)**, representing contrasting historical and climatic contexts.

We will first produce consistent and high-quality databases on:

1. Land cover and land cover change maps from 1950-onwards.
2. Plant species diversity and plant functional traits.
3. Ground-based measurements of ecosystem processes related to carbon cycling (e.g. primary productivity, soil organic matter decomposition).

Historical and projected land use changes as well as historical and future mesoscale climate projections will be used to simulate changes of carbon stocks and fluxes for the 20th and 21st century using the terrestrial ecosystem model ORCHIDEE. Land use change scenarios for the next 50 years will be defined with stakeholders. Key findings will be summarized in short assessment reports and discussed with stakeholders and policymakers in workshops at the end of the project.

Our project is the first attempt to provide reliable and comparative regional-scale simulations of carbon dynamics in European mountain ecosystems that incorporate our best ecological knowledge of these biodiversity hot-spots. It is a milestone towards a better understanding of climate and land use change impacts on carbon sequestration in European mountains..

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