



Tracking Holocene climate and land-use changes in the Alps: the interdisciplinary research projet “Aphrodyte”

F. Arnaud (1) and the Aphrodyte project Team

(1) Environnement Dynamique et Territoires de Montagne (EDYTEM), CNRS, Université de Savoie F-73370 Le Bourget du Lac (fabien.arnaud@univ-savoie.fr)

It is a key question to understand the effects of global warming and its implications for populations in sensitive areas. European Alps, merit special attention due to their role as a climatic barrier, a biodiversity refuge and as a water resource area, and because they are one of the most inhabited and industrialised mountainous areas in the world. Launched in 2003, the Aphrodyte project aim to address this issue by reconstructing past climate changes as well as the way by which humans adapted their social strategies to those changes. In turn, our approach also integrates the human retroactions on their environment through different forms of land-use. This led us to document jointly natural and human-triggered environmental changes through a wide spectrum of paleoenvironmental studies covering various environments from the Rhône flood plain up to high altitude alpine areas. On Lake Bourget we were able to reconstruct the Holocene history of River Rhône floods at a subdecadal time-scale through the quantification of detrital fluxes. Downstream of Lake Bourget, alluvial flood deposits stratigraphically related to archaeological findings give outstanding information hydrological changing conditions and human response to it. The vicinity of Lake Bourget is also rich in archaeological sites dated from Neolithic to Middle Age. Based on the abundance of archaeological remains and pollen series close to Bronze Age dwellings it was possible to assess the population dynamics and land-use changes. In parallel, a new biomarker of millet cultures was first used on the long deep lake sediment core from Le Bourget. Upstream of Lake Bourget, the catchments of two small alpine lakes were investigated. In Lake Anterne we evidenced an important Roman-time lead pollution and reconstructed the temperatures of the past 1800 years using chironomids counts. The palaeobotanical study initiated on Lake Pormenaz catchment area documents the strong human influence at least since the end of Neolithic (~5000 cal. BP).