



Floods, droughts and dwellings in front of the Alps

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From a 14.5 m-long core from Lake Bourget we reconstructed the Holocene-long evolution of Rhône river mineral discharge in front of the Alps at a sub-decadal time-scale. The study of the detrital fraction showed during the paroxysmal periods of flooding activity, the contribution of the higher glacier-covered catchment area significantly increases. As these terrains are naturally not well-suited for human settlements we argue that the detrital signal recorded in Lake Bourget is mainly due to climate rather than to human impact on soils stability. Over the last 4200 years we evidenced 3 periods of depleted water fluxes: the Bronze Age Optimum, the Iron / Roman Age Optimum and the Medieval Warm Period (MWP), respectively. Among those periods, the MWP was particularly well-characterised thanks to a multi-archives approach. Evidences of dry conditions in front of the Alps during the MWP are: 1) meandering pattern in the Rhône course 2) deglaciation of an ice-cave in the Chartreuse Massif and 3) water excess recorded in a stalagmite from the Vercors Massif. This approach was extended to the last 3600 by comparing the results from the Bourget sediment and from the Vercors stalagmite which confirmed the regional significance of both the records. The societal impacts of these climatic oscillations have also been investigated. During the Bronze Age, we hence showed a link between Rhône flooding activity and lake dwellings around Lake Bourget, probably through changes in lake level. In particular, the rise in detrital signal ca. 800 BC corresponds to the younger age of woods used in lake dwellings (813 BC).