



## **Multidisciplinary fingerprinting of Holocene Rhone river detritism in Lake Bourget (NW Alps)**

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The sedimentary processes in the Lake Bourget deduced from spatial investigation of lake sediments shows that the northern basin of the lake receives a significant amount of detrital sediment during major floods of the Rhone river. Flood deposit here may thus be considered as a recorder of NW Alps climate. Thanks to very-high resolution seismic profiles (CHIRP) the location of a 9m-long piston core was optimized and we established a 7200-years record of Rhone river floods at sub-decadal (3 to 8 years) scale by coupling a high-resolution series of magnetic susceptibility (MS) with a low resolution series of major elements (ME) measurements. The use of sediment remnant magnetisations (RM) and micro-grain size (GS) confirmed these interpretations and also revealed the existence of a minor source of sediment due to the reworking of sandy beaches during lake level fluctuations. In parallel, the grid of CHIRP profiles detailed the spatial extension of the flood-related deposits and gave information about lake-level fluctuations. Recently, a 13.5m-long core covering the whole Holocene was retrieved in a more proximal environment. Multi-parameters logging, including spectrophotometry, RM, MS and XRF scanning, coupled with low-resolution measurement (ME, Sr and Nd isotopes, XR-D clay mineralogy and GS) on the core confirmed the previous interpretations and allowed to further precise the source of the detrital fraction: the glaciated higher catchment of the Arve river. Periods of flooding correspond also to the Holocene major glacier advances and suggest a strong climatic control of Rhone River discharge in Lake Bourget.