Geophysical Research Abstracts,
Vol. 10, EGU2008-A-08372, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-08372
EGU General Assembly 2008

Evolution of detrital input to the Lac Saint Point from the Lateglacial to the Holocene: climatic change and anthropic effect (Jura Mountains, France)

A. Leroux (1), V. Bichet (1), M. Magny (1), A-V. Walter-Simonnet (1), H. Richard (1), E. Gauthier (1), T. Adatte (2) and J-P. Simonnet (1)

(1) Chrono-environnement, UMR 6249 CNRS, Université de Franche-Comté, 16 route de Gray, F-25030 Besançon Cedex

(2) Institut de Géologie, Université de Neuchâtel, Rue Emile-Argand 11, CH-2007 Neuchâtel

(aurelie.leroux@univ-fcomte.fr / Phone: +33 3 81 66 60 51)

The lake Saint-Point (850 m a.s.l.) is located in the Jura Mountains by the Swiss border. This lake (7 km^2) is divided into 2 basins separated by a sill located at a depth of 21.5 m. The upstream basin reaches a depth of 41.1m whereas the downstream basin reaches 35.5 m. The lake is fed by the Doubs River, which supplies the main part of the suspended matter. The catchment basin (247 km^2) is composed by Jurassic and Cretaceous carbonate formations. In this context, detrital input can not be reduced to silicate input and the quantification of detrital carbonates input appears to be necessary. In this aim, we need to discriminate detritral carbonates from authigenic production.

A sediment sequence (SP05, 12.5 m long) was cored in the deepest zone of the downstream basin. Presently, this sequence is studied for palaeoenvironmental changes through a multi-proxy approach. The deep sediment sequence presents various carbonated silty facies with lamina that are more or less visible. Physical parameters such as density, the sonic speed and magnetic susceptibility were acquired by continuous diagraphy on a GEOTEK core logger. The mineral fraction has been characterized using grain size analysis, geochemistry (major elements) and mineralogy (XRD). Pollen analysis and characterization of the organic matter were also carried out. The chronology of the sediment sequence was established by means of 24 radiocarbon datings

and the presence of Laacher See Tephra (13 047-13 232 y cal.^{14}C BP (Hadjas *et al.*, 1995)). It spans the Lateglacial and Holocene periods. The age-depth model highlights three main periods with contrasted sedimentation: the Oldest Dryas characterized by a rate of 0.5 mm.y^{-1}, the upper part of Lateglacial with an average rate of 0.1mm.y^{-1} and the Holocene with a sedimentation rate of about 0.5 mm.y^{-1}, and. These variations correspond to periods of main changes in climatic conditions. They are also present in sedimentation as very marked variations in litho-facies. The Lateglacial sequence is composed of two units with an upper part highly condensed. The Holocene is also characterized by two main facies: a carbonate lake-marl in its basal part covered by a more organic and clayey facies beginning with the Subboreal pollen zone.

Analysis of the major elements highlights 2 main contrasted periods of sedimentation with a change of silicate and carbonate contain. During the Pleniglacial and the Lateglacial, the silicate fraction keeps between 25 and 45 % and mineralogical analyse underlines huge input of Quartz. At the beginning of the Holocene, silicate fraction, and especially Quartz, abruptly decreases (silicate fraction represents less than 10%). The shift between the Lateglacial and the Holocene can be explained by forest development in the catchment. As a consequence eolian input may be blocked, detrital carbonates and silicates input considerably decreases and pedogenetic phenomenon becomes dominant. During the Holocene, silicate input steadily increases from the middle of Late Atlantic to the mid-Subbatlantic pollen zones whereas the detrital carbonates input becomes steady at the beginning of the Subboreal. These increases can not be totally related to an anthropic effect since pollen data indicates anthropic activities only from 3700 y calBP. The change in detrital production may be the consequence of the cooling recorded in west-central Europe (Holzhauser *et al.*, 2005). During the last 1000 years, the detrital inputs co-vary again.The Modern period is characterized by an increase in detrital input.