PALEOCLIMATIC RECONSTRUCTION SINCE THE LATE-GLACIAL IN WESTERN SWITZERLAND : STABLE ISOTOPES OF LACUSTRINE CARBONATES

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In order to reconstruct Late-glacial to Holocene paleoclimatic variations of Western Switzerland (Jura zone), the study of two large lakes (Geneva and Neuch,tel, Western Switzerland) and two small lakes (Loclat, near Neuchâtel, and Ilay, French Jura) was carried out by coupling isotopic analyses with sedimentological, palynological, mineralogical, and geochemical data from cores.

Both Lake Geneva and Lake Loclat record climatic variations characteristic of the Late-Glacial / Early Holocene transition, but each one in a different way. The Lake Loclat data set demonstrated that the paleoclimatic evolution of Western Switzerland was very similar to the well constrained evolution of the Swiss Plateau. The classic delta 18O 2‰ negative shift of the Younger Dryas, together with the smaller oscillations of Gerzensee and Aegelsee, are well marked in the Loclat isotopic record. Lake Geneva too is very sensitive to environmental changes, despite its large size and the influence of detrital input from the River Rhone. Moreover, these changes are more pronounced in the sedimentological and mineralogical records than in the geochemical characteristics (i.e. stable isotopes). Changes in productivity are marked in both lakes by abrupt negative shifts in delta 13C values.

Climatic variations during the last two millennia have been smaller than during the Late-Glacial/ Holocene transition, and they are therefore more difficult to detect in lake sediments. Comparison between isotopic and other data (mineralogical, geochemical, palynological, etc.) in a short core representing the last 1500 years of Lake Neuchâtel sedimentation allowed us to unravel its very recent history and to differentiate between anthropogenic and natural factors. Variations in the oxygen and carbon isotopic records are interpreted in terms of: climatic changes, human impact on vegetation with subsequent soil erosion and nutrient delivery to the lake, increased lake productivity, and possible disequilibrium of calcite precipitation during recent eutrophication history. Lake Ilay sediments, covering the same time window as the short core of Lake Neuch,tel, are more influenced by local factors (lake-level fluctuations) and, therefore, only indirect records of paleoclimatic variations are preserved.