Geophysical Research Abstracts, Vol. 7, 08494, 2005
SRef-ID: 1607-7962/gra/EGU05-A-08494

15000 years of climate history and sediment flux evolution from a multi-proxy study of Lac d'Annecy (French Western-Alps).

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The sedimentary infill of the Lac d'Annecy (northwestern French Alps, 446m a.s.l) was investigated using short gravity cores and a 14m-long piston core taken in the deepest part of the basin (65m depth). The high resolution age-depth models result from combining ^{210}Pb and ^{137}Cs chronology, varve-counting, and the detection of historical flood events for the shorts cores. For the long core an age model was established by varve-counting (on numerical pictures), AMS ^{14}C measurements, identification of δ^{18}O variations in Ostracods and tephra layer recognition. This investigation provides a continuous high resolution age depth model (from 5yrs. to 30yrs.) for the Holocene and the Late Glacial (15200 cal yrs BP at the base of the core). Magnetic parameters (magnetic susceptibility, MS; remnant magnetization parameters, ARM and IRM), laser granulometric analyses, carbonate contents, varve-thickness, and spectrophotometric properties (sediment lightness L*) have been investigated along the whole core in varying resolution from 0.3 cm to 10 cm.

The results document local hydrological variations and climate variability since last glacial period. Major climatic shifts and events (Late Glacial climatic oscillations, Younger Dryas, 8.2k-event, Holocene optimum, Little Ice Age…) partially coincide

with changes of drainage basin erosion and modifications of flood event frequency. Human impact is visible in the sediment record starting from 2700 years BP.

The presented study builds a firm base for ongoing multidisciplinary investigations including high-resolution stable isotope records, organic geochemistry, and chironomides.