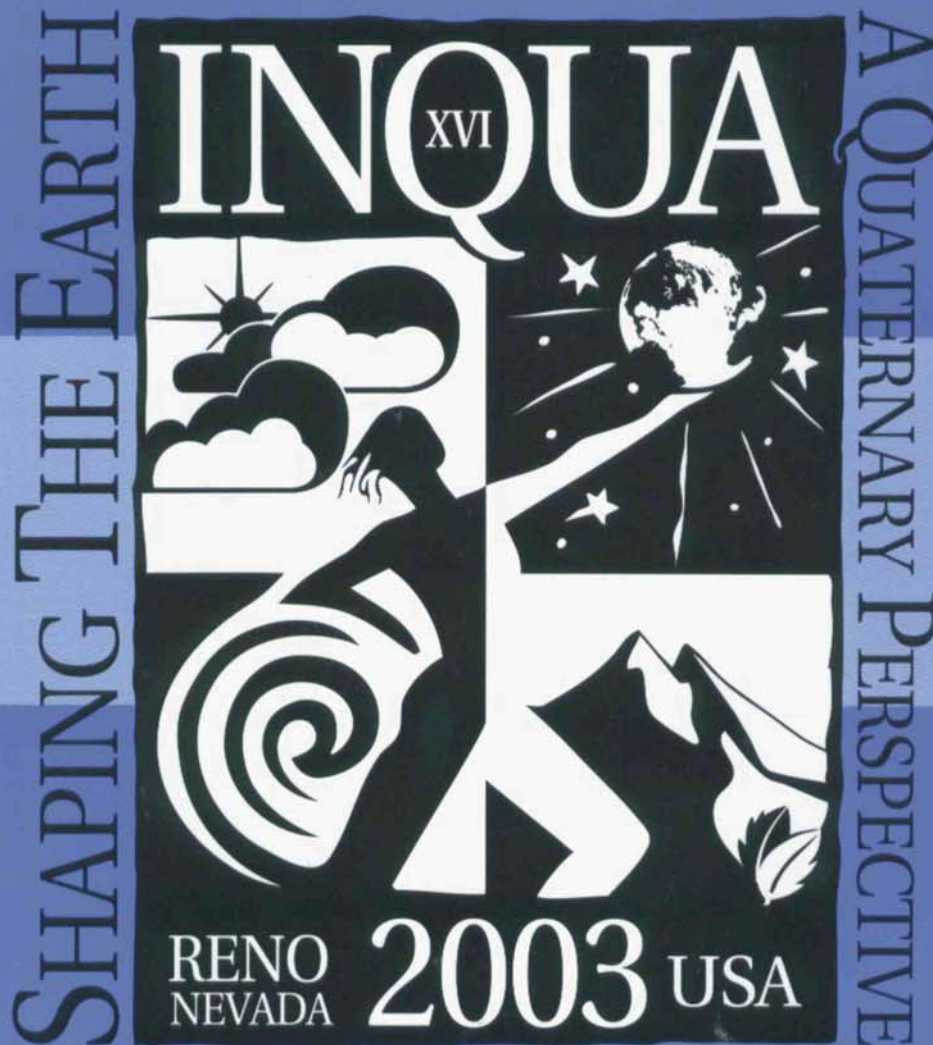


XVI INQUA Congress Programs with Abstracts



July 23–30, 2003

Reno Hilton Hotel and Conference Center
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SESSION NO. 55, 1:30 PM

Monday, July 28, 2003

**S18. Warm Times/Cold Times: Holocene Climate
Variability in the North Atlantic Region (Posters)**

Reno Hilton Resort and Conference Center, Pavilion

55-4 BTH 131 Schulte, Lothar

FLUVIAL ENVIRONMENTS AND CLIMATE VARIABILITY IN THE SWISS ALPS: EVIDENCE FROM THE ALLUVIAL FAN OF THE LÜTSCHINE RIVER (JUNGFRAU MASSIF)

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Fluvial environments respond to changes in climate, physiographic conditions and human activity. Natural paleofloods result from excessive rainfall intensity and frequency, snowmelt, glaciermelt, precipitation combined with frozen soils etc. Holocene global-scale changes in the atmosphere can decisively influence these factors. Furthermore, high mountain areas are characterized by the presence of glacial and periglacial processes, increased slope instability and higher precipitation. The Alps, in particular, separate the humid Atlantic temperate zone from the Mediterranean and are sensitive to extreme rainfall and flood events.

The studies on Holocene river dynamics of Central Europe focused over the last decades on river systems located in the lowlands and low mountain ranges (e.g. Rhine, Danube, Weser, Wisloka valley etc.). In addition to the climate dependence, most of these publications refer to the correlation between glacier variations of the Alps and the river dynamics. However, surprisingly little attention was spent on the alpine fluvial systems, which should be more closely related to the glacier history.

This study addresses the fluvial dynamics of the alluvial fan of the alpine Lütischine River at the northern fringe of the Jungfrau massif focusing on the last 4400 years. The fluvial paleoenvironments were reconstructed by morphological mapping, sedimentological studies of geological sections and drillings, historical maps and documents, geochemistry and pollen analysis. The chronostratigraphy of the deposition processes were established using ¹⁴C-dating techniques, historical data and pottery fragments.

The correlation between the Lütischine river system and the Isola delta in the Upper Engadin, the glacier variations of the West Alps and the lower Grindelwald glacier in particular, as well as the vegetation history of the Alps indicate that fluvial accumulation and erosion processes increased during the cooler Holocene climate events such as the Early Subatlantic Ice Advance (Göschen I period), Early Medieval Ice Advance (Göschen II period) and the Little Ice Age. In contrast, fluvial dynamics during the Roman and Medieval Climate Optimum were less significant and peat formation occurred. The pollen data record the first local human impact since the first century (Roman period).