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Glacially driven sequence development in an active pull apart basin, eastern Austria

B. Salcher (1,2) and M. Wagreich (2)

(1) Department of Earth Sciences, ETH-Zürich, CH-8092 (bernhard.salcher@erdw.ethz.ch), (2) Department of Geodynamics and Sedimentology, University of Vienna, A-1090

Austria's largest Pleistocene Basin, the Mitterndorf Basin, formed as a releasing bend along the sinistral strike-slip Vienna Basin Transfer fault. It extends over an area of about 270 km^2 along the eastern most limits of the Alps. Two mountain front alluvial fans toe out into the southern basin while the northern part is covered by extensive floodplain deposits. Subsidence can be constrained to start somewhere around the late Middle Pleistocene. Accommodation space was provided by vertical slip rates of approx. 0.5 - 1 mm/a. Since that time sediments were preserved, providing a sedimentological archive reflecting climate change and the associated change in lithofacies. During glacial periods, periglacial conditions and low vegetation density in the Alpine hinterland caused high sediment supply which is manifested in up to 35 m thick coarse grained, massive fluvial facies. Transport of material was mainly provided by nival streams under bed load conditions.
With the end of glacial periods, the switch to high discharge to sediment supply ratios generally leads to fluvial incision. Intersection points of the main interfan channels are shifting from the apex downstream. The formation of overbank fines at the distal fan position and along the entire floodplain of the basin mark a switch from braided to meandering conditions. The effect of subsidence becomes now more important as sediment supply is decreased, resulting in alluvial fan headcut erosion, and, if sufficient time is available, may lead to total through trenching. In the stratigraphic record sequences which are associated with warm periods are generally not exceeding some dm to m. Fan surfaces which got abandoned are exposed to widespread soil formation which mark sequence boundaries to the following coarse grained, massive facies of glacial periods.
Generally the fluvial facies in the Mitterndorf Basin is shown to be deposited in stratigraphic cycles controlled by the impacts of Glacials and Interglacials and, as a long term effect, by subsidence. Effects of different vertical displacement velocities on the basin's sequence development could be described by using high resolution fault information. Precise age and climate relevant information derive from rich terrestrial mollusc assemblages, 14C and OSL data covering times from late Middle Pleistocene up to the Holocene.