



Timing of orogen-parallel Rhône valley incision, Switzerland

J. Reinecker, A. Kuhlemann

University of Tuebingen, Germany (reinecker@uni-tuebingen.de)

The change from initial orogen-normal to orogen-parallel drainage networks is not well understood and a matter of discussion. To quantify the impact of different geomorphological factors one has to consider timing and duration. For the longitudinal Rhône valley, draining the central high Alps between the Furkapass and the Mont Blanc, we review and discuss this in the light of revised sediment budget and new thermochronological data. The course of the Rhône river is determined by a zone of lithological weakness in the upper part and by a fault zone in the middle part of the Rhône valley. We argue for a catchment of the Rhône river by south directed normal faulting of the Rhône-Simplon fault zone starting some ~ 3.5 Myr ago. Once trapped, river incision was supported by the structural/lithological weakness of the fault zone, which established the course of the Rhône river. In the course of ongoing normal faulting the Rhône river migrated down the normal fault zone southward relative to the exhuming Gastern-Aar massif in the north. From thermochronological data average exhumation rate was in the order of 0.5 km/Myr over the last 10 Myr for most of the Gastern-Aar massif but reaches values of up to 1.2 km/Myr near the Rhône valley averaged for the last 3.5 Myr. The enhanced exhumation may be attributed to tectonic denudation, localized incision of the Rhône river and glacial erosion, the latter starting ~ 2.8 Myr ago.