



## **Interglacial geomorphic dynamics during the Quaternary: Does glacial erosion dominates interglacial adjustment?**

T. Hoffmann (1,2) and E.A. Johnson (2)

(1) University of Bonn, Department of Geography, Bonn, Germany (thomas.hoffmann@uni-bonn.de, +49 228 739099), (2) University of Calgary, Biogeoscience Institute

High mountains are generally sculptured by glacial erosion, which resulted in the formation of glacial cirques and U-shaped valleys with strongly over-steepened hillslopes and widespread glacial deposits. The abundance of glacial (erosion and depositional) landforms in high mountains has been attributed to very effective glacial erosion and sediment transfer. Furthermore, it has been argued that geomorphic activity remains increased after the retreat of valley glaciers at the transition between glacial and interglacial periods. Thus, geologists and geomorphologists generally tend to look at glaciers as geomorphic agents that strongly enhance erosion and sediment fluxes.

An important aspect of glacial erosion is the effect of glacial erosion on the decoupling of headwater basins from main river systems. Strong glacial erosion results in flat valley bottoms and glacial over-deepening, with reduced transport capacities of the interglacial rivers draining formerly glaciated headwaters. While this effect has been described earlier, quantitative estimates of the degree of decoupling of glacial headwaters are missing.

In this paper, we will present evidence of decreased sediment yields in glacial headwaters, which results from the transition of glacial to peri-/paraglacial process regimes. These evidences are derived from geomorphometric analysis, numerical sediment flux models and sediment budget approaches, which were conducted in the Kananaskis Valley (Canadian Rocky Mountains). Furthermore, we will compare the duration of glacial and interglacial periods during the Quaternary and the calculated interglacial erosion rates with glacial rates. We discuss the wider implications of the results with respect to the landform evolution of glaciated mountains during the Quaternary.