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Denudation processes and sediment transport along a 200 km long transect across the superhumid southernmost Andes at 53˚S

S. Breuer (1), R. Kilian (1), O. Baeza (1) and T. Steinke (1)

(1) Department of Geology, University of Trier, Germany (Sonja.breuer@uni-trier.de; Phone +49-651-2014670)

The southernmost Andes represent one of the most pronounced climate divides of the world with annual precipitations of up to 10000 mm/year. Therefore this mountain range was (is) used as natural laboratory to study denudation processes and mass transfer related to extreme climate conditions. Based on sediment echosounding data and numerous sediment cores, we have compared the sediment budget of five lakes and several sediment basins of a 220 km long fjord transect across the Andes at 53˚S with their potential denudation areas. A small 200 km2 ice cap in the central part of the transect deliver the most distinct sediment supply , due to relatively high glacial denudation rates (up to 1 cm/year) during the Holocene. The most pronounced sediment supply comes from a small 200 km^2 ice cap in the central part of the transect, where the Holocene glacial denudation rates may amount up to 1 cm/year. The Holocene sedimention rates in the fjord system has been mapped along the whole transect, using the echosounding data which shows a very pronounced and widespread 4300 year old tephra layer as well as the interface between the basement rocks and postglacial sediments. During the Holocene, glacial clay derived from the present-day ice cap was preferentially transported to the East, due to westerly-induced eastward superficial currents in the fjord system. Besides influences of wind-induced currents, the westward clay-transport is and was hampered by relatively rapid clay flocculation due to a higher salinity of the western fjord system. Therefore the postglacial terrigenous input to the continental slope and the deep sea trench was (is) very restricted. Despite extreme high precipitations, the exposed rocks in the mountain range without

vegetation cover does not show a notable denudation since the Late Glacial. In contrast, the postglacial denudation rates can amount up to 2 mm/year in active fracture zones. Areas with vegetation cover show intensive chemical weathering of the basement rocks, forming a 10-20 cm clayey layer between basement and overlaying peaty soils. At steeper slopes the vegetation and underlying soils are removed irregularly by land slides into lakes and the fjord system, which may be often triggered by seismic events. Very low pH values of 3 to 5 in these soils produced a significantly enhanced chemical weathering of the silicate minerals, resulting in a very conspicuous chemical denudation in this area which we try to quantify in an ongoing project.