NEW SEDIMENTOLOGICAL AND PALYNOLOGICAL IMPLICATIONS ON THE LATE GLACIAL TO RECENT DEGLACIATION OF THE SOUTHERNMOST ANDES


(1) Lehrstuhl für Geologie, Fachbereich VI, Geowissenschaften, Universität Trier, D-54286 Trier, Germany (kilian@uni-trier.de), (2) Institut für Nachrichtentechnik und Informationselektronik, Universität Rostock, Germany, (3) Instituto Antártico, Universidad Magallanes, Chile, (4) Geologisches Institut, Universität Freiburg, Germany, (5) Institut für Physische Geographie, Universität Freiburg, Germany, (6) Centro de Estudios Científicos, Valdivia, Chile

Late Glacial glacier fluctuations and the deglaciation of the Southernmost Andes was investigated in a transect at 53° S, ranging from the previous ice divide until the proglacial lake Skyring, around 120 km to the east. Glacier derived sediments and submarine moraine systems as well as submarine terraces and neotectonics were observed in the Andean fjords by a Parametric Echo Sounder with a sediment penetration of up to 50 m and a high layer resolution (< 5 cm). Cores drilled into lake and fjord sediments and peat indicate the evolution of soils and the biosphere during deglaciation. In addition, a high resolution pollen record (1 analysis/120 years) from a peat core taken near the previous ice divide show the vegetational history during the last 14500 years.

Investigations of neotectonic structures in basement rocks and fjord sediments indicate that formation and orientation of the glacial valleys (mainly fjords) were strongly controlled by sinistral Magellanes transform fault system and conjugated NNE-trending dextral faults. East of the Andes, the proglacial lakes, like Seno Skyring and Seno Otway, were formed in a N-S extension zone (pull apart basins). Along the eastern slopes of the Andes late Glacial and Holocene horst and graben structures of up to 40 m vertical displacement in the sediments also reflect a young
regime of decompression east of the major transform fault system which has strongly superimposed the glacioisostasy.

A major glacier retreat (>80% of max. length) from the >120 km long proglacial lake Skyring occurred between 18000 and 14200 cal years B.P. During this phase more than >92% of the total ice volume east of the Andean climate divide was lost and extended ice raft debris were deposited in the proglacial lakes.

For the period between 14 200 and 11200 cal years B.P. our palynological record from the area of the previous ice divide shows only the pioneeric plant Gunnera, Cyperacea and Notofagus. This plant association is typical for well drained rocky sites, like moraines and glacial debris, indicating a formation of new moraine systems in this area. Extended subaquatic moraine systems, observed by echo sounder, are likely to be formed during this period and indicate glacier lengths of 20 to 30 km.

Lake sediment records show high late glacial sedimentation rates of clastic sediments until 10400 cal. years B.P., indicating enhanced fluvial erosion of the glacially shaped bedrocks. Afterwards increasing organic sediment components and a significant drop in sedimentation rates indicate the formation of soils and vegetation. The pollen record indicate a well established Magallanes rain fall forest interlocked with peat areas between 10500 until <4000 cal. years B.P.