Geophysical Research Abstracts, Vol. 8, 10571, 2006
SRef-ID: 1607-7962/gra/EGU06-A-10571

ODP Site 1232 off Southern Chile - An Archive of Late Quaternary Climate and Tectonics

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The recovered sedimentary sequence at ODP Site 1232 off Southern Chile represents an upper Pleistocene section of gray silty clay interbedded with various graded layers of dark gray silty sand which are interpreted as basal parts of distal turbidites. Shipboard estimates suggested that the turbiditic layers have an average depth spacing of $\sim$ 30 cm and a mean recurrence time on the order of hundreds of years. This would be in good agreement with the historic seismic record of the tectonically active region which can be reconstructed back into the 16^{th} century. Hence it seems to be obvious that devastating earthquakes like the prominent M9.5 Valdivia event in 1960 provide the trigger mechanism for large turbidity current flows.

Our intention is to investigate the frequency variations of turbidites at the southern Chilean continental margin in more detail and to distinguish the possible seismic and also climatic signals within the sedimentary section.

We substantially improved the shipboard age model using ^{14}C-AMS dating and oxygen isotope measurements on planktonic foraminifera which were collected from the hemipelagic intervals of the sedimentary section. By the application of the new age model, changes in the sedimentation rate as well as changes in the recurrence time of the turbidites could be calculated more precisely. The new computed turbidite frequency record shows a general conformity with the SPECMAP δ^{18}O curve that represents global climate and sea level changes. Thus it is likely, that the long-term (i.e. orbital-scale) evolution of turbidite frequencies off Southern Chile may well be influenced by sea-level and onshore climate as the region received substantially higher

rainfall during the last glacial. In addition, century- to millennial-scale climate changes that are pronounced in the region may have the potential to influence the frequency of turbidites as well. For instance, large changes in Patagonian ice-sheet extent strongly influence the terrigenous sediment supply to the shelf and thus potentially control the reloading rate of the source regions for the turbidites at the shelf edge. By a detailed comparison to the terrigenous sediment record of ODP Site 1233 that provided a record of Patagonian ice sheet variability, we try to distinguish climate impacts on shorter-term turbidite variability as well.