



## Submarine mass wasting features at the southern central Chilean continental margin - a new database

David Voelker, Jacob Geersen, Willi R. Weinrebe, and Jan H. Behrmann

SFB574, IFM-GEOMAR Leibniz Institute for Marine Sciences at the University of Kiel, Wischhofstr. 1-3, Germany  
(dvoelker@ifm-geomar.de / Phone: +49-431-6002566)

Based on an extensive set of swath bathymetry data that was obtained on 12 cruises and cover about 72% of the Chilean continental margin between 33°S and 43°S, up to now more than 60 submarine mass wasting features were detected, mapped and described. They form a wide spectrum in size, apparent slide mechanism and volume. Most of them are small if compared to mass wasting features on passive continental margins.

We analyze the database with the aim to determine the main tectonic preconditioning factors for mass wasting along this densely populated part of the Chilean coastline. Major factors are (1) slope undercutting by the incision of erosive submarine canyons, (2) slope oversteepening by active folding and faulting, and (3) accretionary wedge collapse due to localized sediment underplating and/or frontal accretion. A major stratigraphic control on mass wasting may be in the form of offshore deposition of thick volcanic ash fallout of the Southern Volcanic Zone of Chile. Also fluid seepage from overpressured faults tapping dewatering subducted sediments at depth may contribute to destabilization of sediments on the continental slope. Obvious triggers are the large thrust earthquakes that shake the region with a historical recurrence time of  $\sim 150$  y.

About half of the features are directly related to the active submarine canyons on the forearc. The collapse of canyon walls partly impinges on the open slope where thin translational slides detach from discrete horizons. Apart from the slides directly related to canyons, we identified medium-sized (5-25 km<sup>3</sup>) blocky slides that affect the lowermost continental slope, and small spoon-shaped headscarsps of slides, which deliver their material into slope basins. A particular feature is given by Valdes Slide which developed on an upper slope thrust ramp, with mass wasting directed landward.

There is no straight-forward relationship between simple geomorphic parameters such as slope gradient or curvature, and the spatial distribution of slump features, as was previously observed e.g. offshore the Pacific coast of Nicaragua.

The database will serve as comparison to other regional datasets of convergent margins such as for Central America, but also to the COSTA database of mass wasting features on the North Atlantic passive margin.