Geophysical Research Abstracts, Vol. 8, 02497, 2006
SRef-ID: 1607-7962/gra/EGU06-A-02497

Dakar Canyon off Senegal: A major erosive Canyon destroyed by a large mass wasting Event

S. Krastel (1), T.J.J. Hanebuth (1), R.B. Wynn (2), L. Zuehlsdorff (1, 3), M. Bruening (1), J. Felzenberg (4), R. Henrich (1), M. Kölling (1), H.D. Schulz (1)

(1) Research Center of Ocean Margins, Bremen University, Germany, (2) National Oceanography Centre, Southampton, UK, (3) Now at NORSAR, Bergen, Norway, (4) Wesleyan University, Wesleyan Station, Middletown, Connecticut, USA (skrastel@uni-bremen.de)

The continental margin off Northwest Africa is largely shaped by a complex interplay of sediment transport processes directed both downslope and along-slope. During Meteor-Cruise M65/2 we investigated the sediment transport processes off Senegal and The Gambia by means of geophysical, sedimentological, and geochemical methods. High-resolution seismic and hydroacoustic (Parasound, Hydrosweep) measurements were used to study the areal extent and the internal structure of redeposited sediments. Based on these measurements sediment cores were taken for sedimentological and geochemical analyses.

The continental slope off Senegal is remarkably stable without any indications of large scale downslope sediment-transport. Even off the Gambia-River with its supposed large fluvial sediment input we neither see indications for significant sediment transport on the open slope nor in a submarine channel. The largest canyon system in the investigated area is the Dakar Canyon, a relatively straight up to 700m deep canyon. The upper part of the canyon is incised in a complex pattern of slope sediments with some tributary canyon, several buried canyons, and major erosional unconformities, suggesting a complex evolution of Dakar Canyon and the upper slope. The middle part of the canyon is incised in well stratified slope sediments. The incision depth is 400m in 3000m water depth and 250m in 3500m water depth. The absence of levees suggests that flows are highly confined at this section of the canyon. Several cores taken close to the canyon axis show a $\sim$50cm Holocene drape on top of numerous turbidites with a sandy base, which demonstrate the importance of sediment transport during

the last glacial period. The most interesting part is the distal part of the canyon. The further decrease of incision depth to $<$200m is accompanied with the occurrence of well developed levees. On a distance of $<$10km incision depth decreases from $\sim$100m to $<$20m. Seismic data show that the original canyon is now filled with slide deposits and was therefore destroyed by a major mass wasting event, which we named Dakar Slide. Our data suggest that the confined flows travelling in Dakar Canyon spread over a large area further downslope once the canyon was destroyed by the slide. Dakar Slide is an atypical slide in terms of water depth and slope gradient of the headwall area. The headwall located in 3500m water depth is unusually deep and slope gradients of only 0.5° are very low. It is also a very large slide with a diameter of $>$100km. Slides in water depths around 3500m were also imaged off the southern edge of the Senegal suggesting that large scale mass wasting in water depths $>$3000m is more important at this margin than previously suggested.