

## **Giant landslides and turbidity currents in the Agadir Canyon Region, NW-Africa**

Sebastian Krastel (1), Russell B. Wynn (2), Christopher Stevenson (3), Peter Feldens (4), Lisa Mehringer (5), and Anke Schürer (5)

(1) Kiel University, Institute of Geosciences, Kiel, Germany (skrastel@geophysik.uni-kiel.de), (2) National Oceanography Centre Southampton, UK, (3) University of Manchester, UK, (4) Leibniz Institute for Baltic Sea Research, Warnemünde, Germany, (5) Bremen University, Germany

Coring and drilling of the Moroccan Turbidite System off NW-Africa revealed a long sequence of turbidites, mostly sourced from the Moroccan continental margin and the volcanic Canary Islands. The largest individual flow deposits in the Moroccan Turbidite System contain sediment volumes  $>100 \text{ km}^3$ , although these large-scale events are relatively infrequent with a recurrence interval of  $\sim 10,000$  years (over the last 200,000 years). The largest siliciclastic flow in the last 200,000 years was the 'Bed 5 event', which transported  $160 \text{ km}^3$  of sediment up to 2000 km from the Agadir Canyon region to the southwest Madeira Abyssal Plain. While the Moroccan Turbidite System is extremely well investigated, almost no data from the source region, i.e. the Agadir Canyon, are available. Understanding why some submarine landslides remain as coherent blocks of sediment throughout their passage downslope, while others mix and disintegrate almost immediately after initial failure, is a major scientific challenge, which was addressed in the Agadir Canyon source region during RV Maria S. Merian Cruise MSM32 in late 2013.

A major landslide area was identified  $\sim 200$  km south of the Agadir Canyon. A landslide was traced from this failure area to the Agadir Canyon. This landslide entered the canyon in about 2500 m water depth. Despite a significant increase in slope angle, the landslide did not disintegrate into a turbidity current when entering the canyon but moved on as landslide for at least another 200 km down the canyon. The age of the landslide ( $\sim 145$  ka) does not correspond to any major turbidite deposit in the Moroccan Turbidite System, further supporting the fact that the landslide did not disintegrate into a major turbidity current.

A core taken about 350 m above the thalweg in the head region of Agadir Canyon shows a single coarse-grained turbidite, which resembles the composition of the Bed 5 event in the Madeira Abyssal Plain. Hence, the Bed 5 turbidite originated as a failure in the head region of the Agadir Canyon. Interestingly, this failure did not leave a major landslide scarp behind suggesting a small initial failure despite the large-volume deposits in the Madeira Abyssal Plain. The turbidity current must have eroded and incorporated huge amounts of sediments while traveling through the canyon.