



## **Drilling in Current-Controlled Sedimentary Environments on the Southeast African Margin - The SAFARI Pre-Site Survey Challenges on the Madagascar, Mozambique and the South African Margin**

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As part of the global conveyor belt circulation, the Agulhas, Mozambique and Madagascar Currents are guided southward along the Southeast African margin as strong contour currents, affecting local sediment mobilization, redistribution and deposition. To gain a better understanding of their evolution through time, a transect of drill sites ranging from the southern tip of Africa to Madagascar was proposed by Zahn et al. (SAFARI, IODP proposal 702).

As contour currents become erosive in their vicinity, deposition may be inhibited and incoming sediment will be redistributed. To find suitable drill sites, they must be positioned strategically to provide continuous depositional records on the one hand by not being located in the core of the current, and to record variations in current activity and strength, which requires a certain proximity to the mean current position. Furthermore, sources of sediment and their spatial and temporal variability play a role for the interpretation of accumulation rates, provenance of particles, reconstruction of current velocities and terrestrial input, which can be compared as climate indicators with marine geochemical tracers.

Six different working areas, West of Capetown, Natal Valley, Limpopo Cone, Zambezi margin, Davie Ridge and N-Madagascar margin, were visited during R/V Meteor Cruises M63/1 (2005) and M75/3 (2008) to gain an understanding of sediment deposition and to select sites for the drilling proposal.

Main observations of both cruises were, in contrast to the expectation of margins being predominantly shaped by fan deposition and mass wasting processes, the widespread occurrences of large scale contourite bodies, which were situated between 100 and 1500 m water depth. They appear to be independent of the mechanisms and volume of sediment input, revealing a close relationship to the acting contour currents. Accordingly, the drift bodies appear to be suitable deposits which record the activity of the currents by sedimentologic properties.

For the preparation of the drilling proposal we started to develop a regional stratigraphy to estimate accumulation rates and to reconstruct the shift of depocenters in space and time. Examples are shown for different working areas with a focus on the Limpopo and Zambezi, where extended drift deposits tell the story of onset and variation of the regional current systems.