



Modelling the evolution of currents south of South Africa since mid-Miocene times based on the Agulhas Drift, southwest Indian Ocean

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A numerical model of the ocean circulation coupled with a sediment transport model is proposed to reconstruct the currents' evolution in the south of South Africa. This area is an important gateway for the interocean exchange of water masses from the Atlantic, Indian and Southern Oceans. Three major water masses involved are: the warm and saline water of the Agulhas Current at the surface, the cold and saline North Atlantic Deep Water (NADW) in larger depth and the cold Antarctic Bottom Water (AABW) near the bottom. The development of the oceanic currents can be inferred from the record of sediment drifts, because the current system drives the sedimentary system of erosion transport and deposition in oceanic basin. Hence the characteristics of sediment drifts provide the information of the regional paleocirculation patterns. Seismic reflection and refraction data in the region of the Agulhas Drift in the southwest Indian Ocean were measured during the RV "SONNE" cruise SO-182. It is concluded that the Agulhas Drift formed in mid-Miocene. Based on the Agulhas Drift, we plan to develop a model to simulate the evolution of current system and sediment transport since mid-Miocene times in the selected period in this region. The model will be validated and improved by comparing the results computed from the model with the geological and oceanographic features indicated from the measurements. Within the wide range of numerical models available, the Regional Oceanic Modelling System (ROMS) is selected, because it is an advanced open-source model with high resolution, and the sediment transport algorithms have been incorporated.