

## The MAD-Ridge cruise: physical interactions on a seamount ecosystem in the West Indian Ocean- preliminary results

J.-F. Ternon, P. Vianello, S. Herbette, F. Dilmahamod, M. Noyon & M. Roberts

IRD UMR 248 MARBEC, France

Ocean Science and Marine Food Security National Oceanography Centre, UK &

Nelson Mandela Metropolitan University, South Africa

Université de Bretagne Occidentale, France

University of Cape Town, South Africa

Ocean Science and Marine Food Security National Oceanography Centre, UK &

Nelson Mandela Metropolitan University, South Africa

Ocean Science and Marine Food Security National Oceanography Centre, UK &

Nelson Mandela Metropolitan University, South Africa

[jean-francois.ternon@ird.fr](mailto:jean-francois.ternon@ird.fr)

Seamounts cause discontinuities in the oceanic flow with potential impact on ecosystem functioning. This is particularly true for shallow seamounts located in highly dynamic oceanographic region where flow-topography interactions generate physical processes such as eddy-shaped recirculation cells (retention) above the seamount summit, advection of nutrients via upwelling along the seamount slope or internal waves. Such processes may enhance biological production in the vicinity of the seamount affecting all trophic compartments, from phyto- and zooplankton up to marine top predators. Thus, seamount ecosystems can play a critical role in term of food supply, especially in oligotrophic areas. On the other hand, such isolated ecosystem can be vulnerable to human exploitation (overfishing, mining). IRD (France) organized the MAD-Ridge cruise (November-December 2016) with its partners in South Africa (NMU – Port Elizabeth, DEA and BCRE - Cape Town), in France (Université de la Réunion, CNRS, IFREMER) and Madagascar (IHSM) – onboard the R/V ANTEA. The cruise was on a shallow (240m) seamount located within the South EEZ of Madagascar (at 27 °25'S, 46 °15'E). The MAD-Ridge seamount is part of the South Madagascar Ridge and located within the "eddy corridor" flowing into the Agulhas Current. In this highly dynamical context, we hypothesized that the biological productivity leading to the observed presence of marine top predators (pelagic fish and seabird) might be related to current-topography interactions. The cruise was multidisciplinary, covering physics, biogeochemistry, plankton and micronekton sampling, and seabird and marine mammal's observations. In this work, we will present preliminary results on the environmental descriptors collected at the time of MAD-Ridge (at sea and satellite observations) covering physics (currents), hydrology (temperature, salinity, oxygen, and fluorescence), nutrients and zooplankton biovolumes. The extended region surrounding the seamount seems to be mainly governed by mesoscale eddy dynamics whereas in the close proximity of the seamount, short scale patterns appear to be more influenced by eddy-seamount interactions.