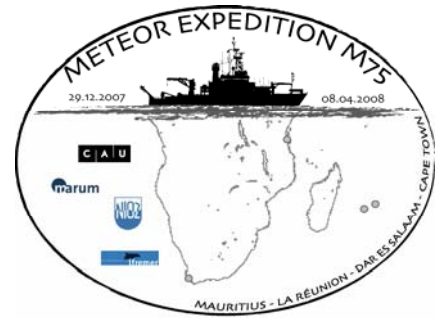


Expedition Meteor M75/1 – ERODER 2



1. Wochenbericht: 29-12 - 30.12.2007

The Leg M 75/1a is one of the 2 foreign legs involved in the M75 campaign via the European ship barter. This is an unprecedented situation that could become more frequent in the next future as european fleet intercollaboration increases. The M75/1, which is the the first leg of the RV Meteor M75 campaign, is **also named** ERODER 2, as it is part of a more complete geological program named ERODER: a high resolution study focused on the submarine slopes of La Réunion Island (Indian Ocean).

This cruise has 3 main objectives:

- (1) to better understand the geological structure of the volcanic island (the emerged part is only 1/30th of the total),
- (2) its evolution through time and
- (3) the current dynamics of material transfer processes to the deep-sea.

Two cruises had been performed in 2006 around the island with french oceanographic vessels: FOREVER and ERODER 1 ; they led to the discovery of volcanodetritic deep sea fans and new volcanic structures around La Réunion Island.

The main goal of the ERODER 2 cruise is to collect more detailed bathymetric, backscatter and mud-penetrator data on these fans to understand their origin and evolution and to study their present activity. A large number of new seamounts have been mapped during the recent cruises. Some of them must be sampled to understand their origin and ages.

The French scientific team arrived on board the RV Meteor in Port Louis (Mauritius Island) on December 28th. It has the support of german technicians and engineers, who will participate to the cruise and will help the team to collect data with the sophisticated echosounders hull-mounted on board the RV Meteor. The Vessel left Mauritius island on Friday 29th, just before lunch time.

After several hours of transit towards La Réunion Island, scientific operations started by around 4000 m water depth by dredging on a flank of a submarine volcano discovered in 2006. Two small lava debris were caught. They will help to determine the age of lavas and their origin.

Then one long geophysical profile has been acquired towards La Reunion island using the EM120 swath bathymetric device, a magnetometer and the parasound

subbottom profiler. This first profile will be used to define the best acquisition parameters for deep-sea exploration in such a volcanodetrific environment.

The island of La Réunion sensu stricto consists of two juxtaposed volcanic massifs: Piton des Neiges, which is a dormant volcano and Piton de La Fournaise, which is a highly active basaltic shield volcano, that has grown continuously since at least 0.527 Ma. It is currently one of the most active volcanoes in the world. The recent volcanic activity is mainly concentrated inside a caldera that formed less than 5000 years ago. However, outside the caldera, two broad topographic ridges are interpreted as volcanic rift-zone, or preferential pathways for the magma. The present activity is mainly controlled by a magma reservoir located near or just below sea level. From this reservoir, magma injects into the rift-zones and travels from the central part of the volcano to the distal flanks.

Although eruptions along these structures outside of the main caldera of the volcano are not frequent, averaging two or three per century, they are long-lived structures. In the submarine part of the Piton de la Fournaise volcano, these zones depart noticeably in morphology from the other submarine terrains. They are observed near to the coast, have rugged topography and steep slopes at the base but rather smoother morphologies at the top.

Sunday 30th has been focused on dredging operations of these submarine rift zones. Strong and unstable surface oceanic currents make dredging operations difficult and longer than expected by the scientific team. The first dredge collected old and altered lavas (see photo).



The cruise is just starting, the weather is sunny and the sea quite calm. Hoping that these good conditions will continue for next weeks.