SHORT CRUISE REPORT
RV METEOR Cruise M 75/1b

Dates: 19.01.2008 – 04.02.2008
Port calls: la Reunion – Dar es Salaam
Chief scientist: Prof. Herman Ridderinkhof

Participants:

Name	**Institute**	**Function/ Speciality**
Herman Ridderinkhof	NIOZ	Chief scientist
Geert-Jan Brummer	NIOZ	Sediment traps, Marine geology
Erica Koning	NIOZ	Multicoring, Geochemistry
Sharyn Crawford	NIOZ	Chemical analyses
Evelien van Weerlee	NIOZ	Nutrients, oxygen
Leon Wuis	NIOZ	Moorings
Marcel Bakker	NIOZ	Moorings
Theo Hillebrand	NIOZ	Mooring instruments
Kees Veth	NIOZ	LADCP, CTD
Margriet Hiehle	NIOZ	LADCP, CTD
Ulrike Fallet	NIOZ	Sediment traps, cores
Suzanne Vogels	VU	MSc Student sedimentology
Christina van Assen	UvA	MSc Student sedimentology
Mary Veth	NIOZ	Water sampling
Uwe Harlander	UB	PostDoc current meters
Erik van Sebille	RUU	PhD student – Mooring instruments
Arjen Terwisscha van Sheltinga	RUU	PostDoc – Mooring instruments
Cyrus Karas	IfM GEOMAR	Multibeam and Parasound

Institutes:

NIOZ:	Royal Netherlands Institute for Sea Research
VU:	Free University of Amsterdam
UvA:	University of Amsterdam
UB:	University of Brandenburg
IfM:	Institut für Meereskunde

Objectives:

The goal of cruise M75-1B was:

1) long-term monitoring of the currents, some hydrographic properties and vertical particle fluxes at the narrowest section of the Mozambique Channel,

2) to obtain detailed information on the hydrography along this section, and

3) to obtain information on the sediment composition along the mooring section.

Cruise narrative:

Early in the morning on Saturday 19 January 2008 RV Meteor left the quay in the harbor of le Port, la Reunion, and headed for the northern entrance to the Mozambique Channel to deploy moorings and perform hydrographic observations and to take samples from the seafloor at the narrowest section of the Mozambique Channel. On Monday 21 January the northern entrance to the Mozambique Channel was reached.

On Wednesday 23 January the work along the mooring section in the Mozambique Channel started at the western, Mozambique, side of the channel with the succesfull recovery of mooring LMC9. During the evening and night two CTD stations and two Multicore stations on the continental slope against the Mozambique shelf were occupied. Starting at sunrise, moorings LMC8, LMC7 and LMC6 could be recovered successfully on Thursday 24 January. During the following night one Multicore station and one CTD station (due to time constraints not he full depth) in the deepest part of the section were carried out. During daylight on Friday 25 January all 4 remaining moorings, LMC5A, the trap mooring, LMC5 and LMC4 were released and taken on deck. The recovery of all moorings went very smoothly: all releases reacted on the first command and came to the surface as expected. Mooring recovery was done as quick as possible because of the predicted development of a tropical cyclone just to the north of the measuring section. During the night one Multicore and one CTD station was occupied on the Madagascar continental slope. On Saturday 25 January two moorings, the trap and LMC5, were redeployed before RV Meteor set course in a southwest direction because of the presence of the tropical cyclone FAME just to the northwest of the section, on the Madagascar side of

the Mozambique Channel. The shelter area, some 200 nm to the southwest, was reached on Sunday. FS Meteor remained in this area till Monday morning 4 am when FAME had passed the measuring section and had gone eastward to enter Madagascar. The measuring section was reached again late in the evening on Monday 28 January.

During the night two CTD stations were occupied and at sunrise mooring LMC4, close to the coast of Mozambique was redeployed, followed by mooring LMC5A in the late afternoon. On Tuesday evening sediment cores were taken nearby the trap site with a multicorer and during the night and early morning CTD stations were occupied between the trap site and mooring site LMC6. On Wednesday moorings LMC6 and LMC7 were redeployed during daytime. In the evening and night only CTD stations in the centre of the channel between mooring site LMC6 and LMC8 were occupied. On Thursday morning first a multicore station was done before mooring LMC8 was redeployed. During transit to LMC9 the Meteor sailed closely along the French Island Ile Juan de Nova (sightseeing). Late afternoon the last mooring, LMC9, was redeployed. In the evening two multicore stations were occupied at shallow depths (200m and 700 m), before the three last CTD stations were taken on the Madagascar side of the mooring section. On Friday morning at 5 am, shiptime, RV Meteor set course to Dar es Salaam. Transit was done along the top of the Davies ridge to obtain acoustic profiles (multibeam).

The Meteor arrived at the Dar es Salaam pilot station on Monday morning, 4 February 2008, at 07.00 local time and the scientific crew debarked on the same day.

Cruise Track

The cruise was carried out from la Reunion, France to Dar es Salaam, Tanzania. The main work area was at the narrowest section of the Mozambique Channel where moorings were recovered, service and redeployed, a hydrographic section was done and samples from the seafloor were obtained with a multi- and mono-corer. The complete cruise track is shown in figure 1. The Meteor sailed some 200 nm to the southwest to shelter for the tropical cyclone FAME that passed over the mooring section.

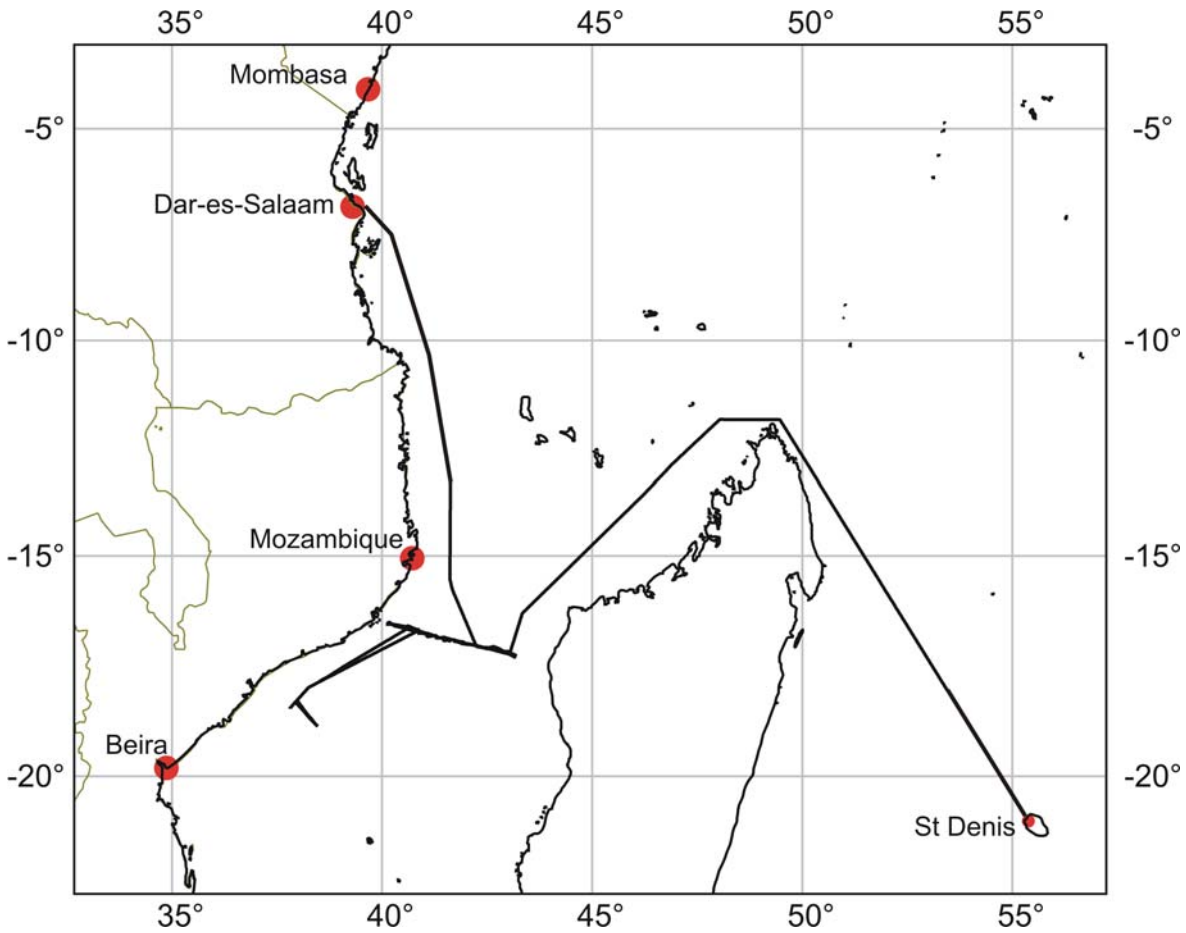

Figure 1. Cruise track of FS Meteor cruise ME75-1B

Hydrographic Stations

A total of 17 CTD casts was recorded. On all of these casts, water samples were taken for the determinations of nutrient, and, less frequently, dissolved oxygen. A lowered Acoustic Doppler Curent Profiler (LADCP) was attached to the CTD frame to measure vertical profiles of the current speed and direction. A mono-corer that was attached to the CTD frame took samples from the seafloor on all CTD stations. The positions of the hydrographic stations along the mooring sections are indicated in figure 2.

At the hydrographic stations the SBE9/11+ CTD was lowered with a speed of about 1 m/s. Due to the use of an altimeter we were able to sample to within quite a short distance from the bottom (on average 10 m).

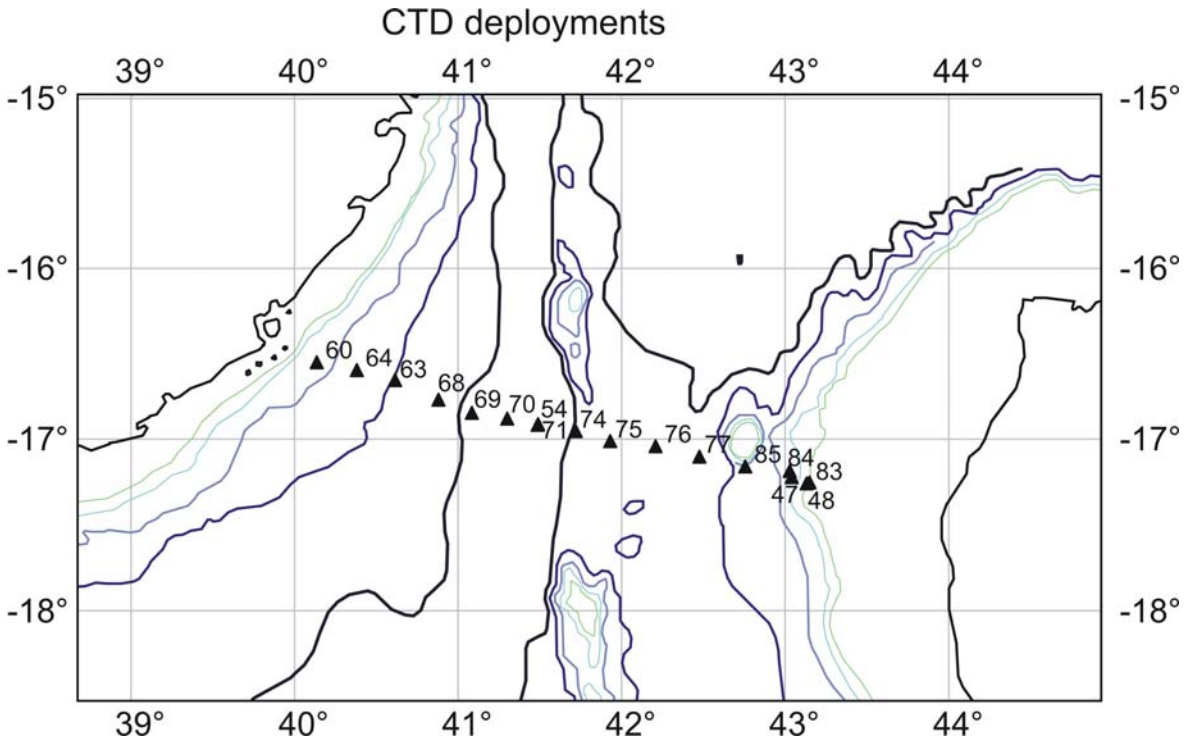

Figure 2. Distribution of hydrographic stations.

Moorings

The major goal of this cruise was the recovery, servicing and redeployment of an array of long-term moorings in the narrowest part of the Mozambique Channel. These moorings have been deployed for the first time in November 2003 and have been serviced in March 2005 and March 2006. 7 moorings are equipped with ADCP's, current meters and T-S sensors. In addition, one mooring with 2 sediment traps, current meters and T-S sensors was deployed. The position of the moorings and the location and type of instruments in the cross-section is shown in figure 5. The measuring interval of the physical instruments ranges from 5 minutes (T-S sensors), 15 minutes (current meters) to 30 minutes (ADCP's). The cups in the sediment traps collect discrete samples over intervals of 17-23 days. Detailed information on the moorings is listed in appendix B.

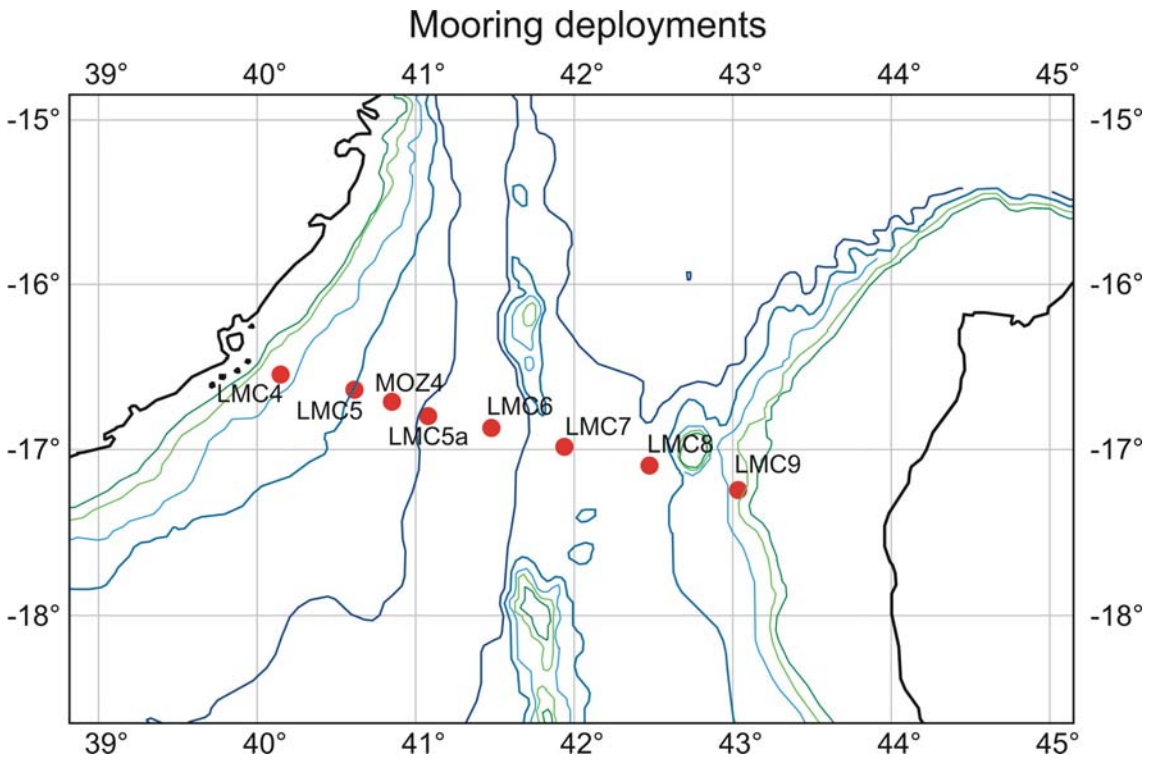

Figure 5. Position of the long-term moorings in Mozambique Channel.

Multicore stations

At 7 locations along the mooring section Multicore stations were occupied. The bottom samples were used to determine the vertical distribution of nutrients in the upper cm's and to determine the composition of the sediments. Figure 6 shows the positions of the multicore stations.

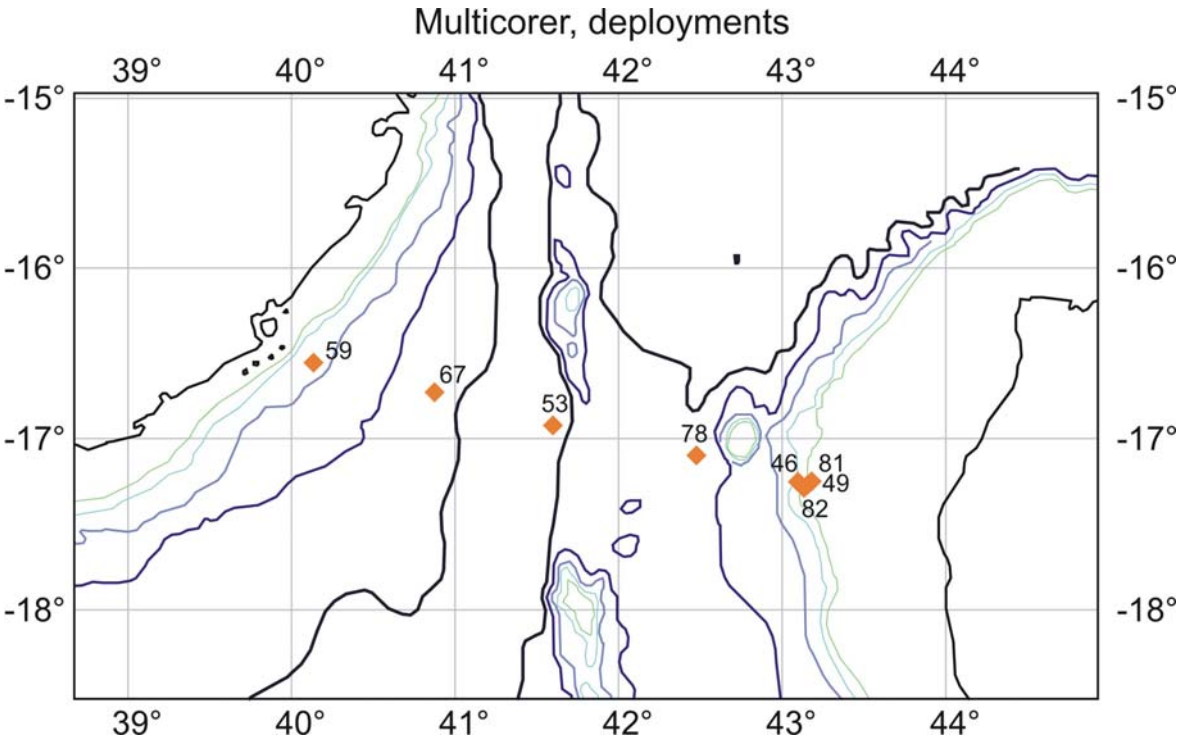

Figure 6. Position of the Multicore stations across the section.