

Report on Oceanographic Cruise of O. R. V. Sagar Kanya

CRUISE No. 42

20th May to 17th June, 1988



National Institute of Oceanography
Dona Paula-403 004, Goa
INDIA

NATIONAL INSTITUTE OF OCEANOGRAPHY
(Council of Scientific & Industrial Research)
Dona Paula, Goa - 403 004

REPORT ON
42ND OCEANOGRAPHIC CRUISE OF
O.R.V. SAGAR KANYA

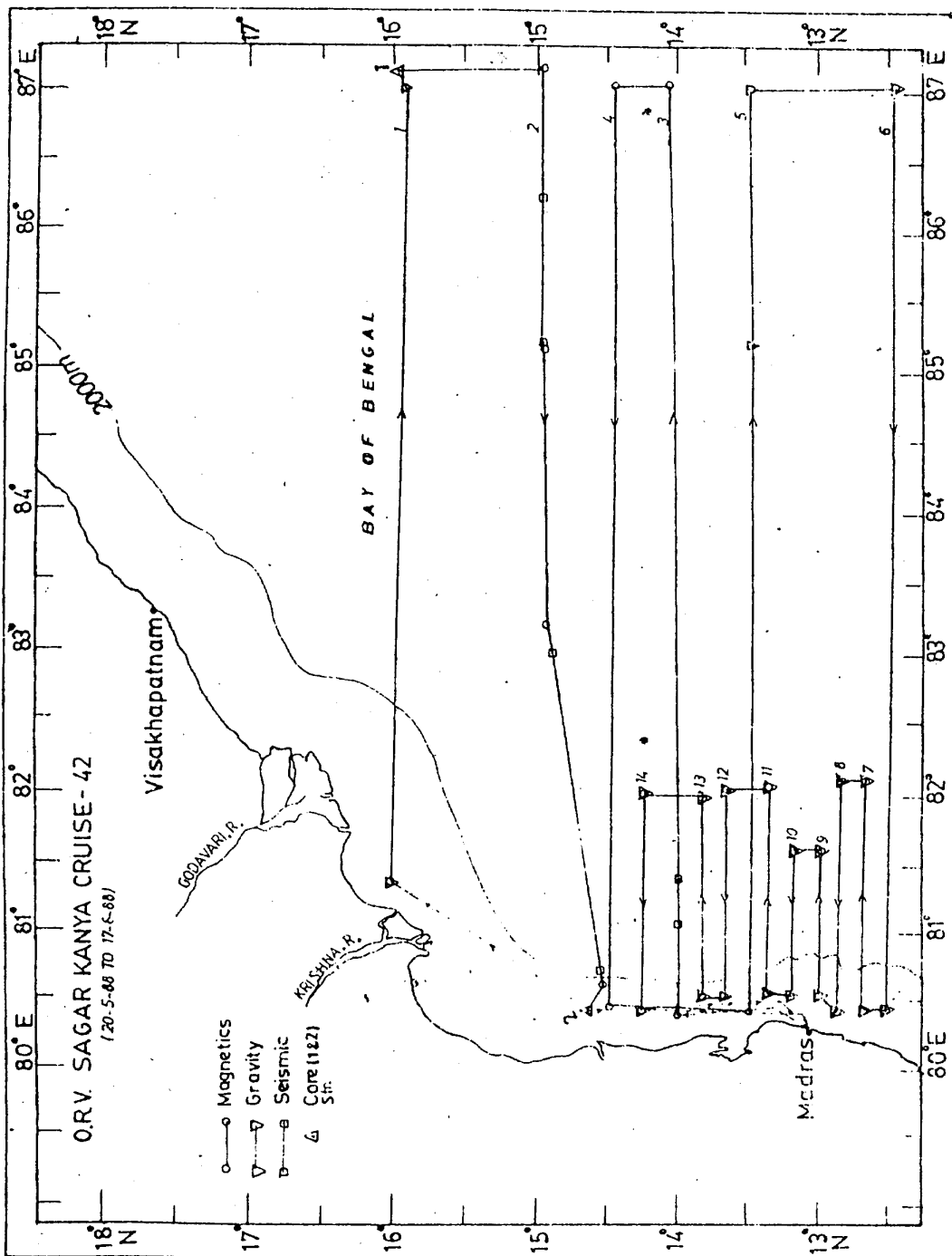
(20 May to 17 June, 1988)

REPORT ON THE 42ND OCEANOGRAPHIC CRUISE OF
O.R.V. SAGER KANYS

C O N T E N T S

1. Cruise track and station
2. Cruise summary
3. Participants
 - a) Scientific component
 - b) Ship's complement
4. Objectives and original cruise plan
5. Synopsis of observations and data collected
6. Preliminary results
7. Acknowledgements

Annex - 1: Summary of geophysical observations



3. PARTICIPANTS

a) Scientific component:

T.C.S. Rao	-	Chief Scientist
CH. M. Rao	-	Deputy Chief Scientist
K. K.S.R. Murtny	X	
M.M. Malleswara Rao	X	
A.S. Subrahmanyam	X	Regional Centre, N.I.O. Waltair
N.P.C. Reddy	X	
K. Mohan Rao	X	
M.K. Prem Kumar	X	
S. Kannan	X	
S. Lakshminarayana	X	
O.S. Chauhan	X	
L.V. Subba Raju	X	
S. Afzulpurkar	X	
G.M. Phadte	X	
D. Gracias	X	Geological Oceanography, N.I.O., Goa
T. Janaki Raman	X	
V. Fernando	X	
R. Venkatesan	X	
V.S. Rajaraman	X	
P. Ganesan	X	
Talaulikar	X	
S.S. Gaonkar	X	
S.I. Reddy	X	
G.S. Mittal	X	
C. Subrahmanyam	X	
R.K. Drobia	X	N.G.R.I., Hyderabad
S.N. Rai	X	
S.K. Ghosh	X	
M.J. Thakur	-	C.M.C., Madras
Kailash Dilley	-	P.R.L., Ahmedabad

b) Ship's complement:

M.V. Agarkar	Master
C. Carneiro	Chief Officer
M.A. Khot	Second Officer
L. Nayar	Second Officer
S.D. Warke	Chief Radio Officer
P.P.R. Hair	Radio Officer
Dr. D.S. Murthy	Medical Officer
R.G.S.DISilva	Purser
R.V. Lad	Chief Engineer
K.I. Singh	Second Engineer
C.T. Lharmik	Third Engineer
T. Dasgupta	Fifth Engineer
A. Dutta Choudhary	Fifth Engineer
Mohan Awardi	Electrical Engineer
Om Prakash Bharadwaj	Electronics Engineer
R. Fernandes	Catering Officer
A. Rodricks	Asst. Catering Officer

4. OBJECTIVES AND ORIGINAL CRUISE PLAN

The main objectives of this cruise were

1. To collect magnetic, bathymetric, gravity and multi-channel seismic data over the central Bengal Fan area which included some important tectonic features such as the 85°E ridge, 90°E ridge, marginal basin, etc.
2. To collect core samples at selected places over the deeper regions and the eastern continental margins of India.

It was originally planned to collect the geophysical data along long range profiles extending from the eastern continental margins upto Andaman sea. However, due to rough weather and the breakdown in equipment, especially the multichannel seismic system and the gravimeter, the activities were mainly confined to the collection of magnetic and bathymetric data in addition to some limited gravity data and very little seismic data on trial basis.

Itinerary:

20-5-1988	- Embarkation & Sailing from Madras Port
30-5-1988	- Return to Madras for fuel and ration
2-06-1988	- Sailing from Madras
17-6-1988	- Disembarkation at Madras & end of cruise

5. SYNOPSIS OF OBSERVATIONS AND DATA COLLECTED

Location of the geophysical profiles covered during this cruise and the core samples collected are shown in the figure. The geophysical work mainly comprised of (i) 6 profiles at half degree interval from the coast upto 87°E and between $12^{\circ}30'\text{N}$ and 16°N and (ii) 8 short profiles covering the EEZ between $12^{\circ}30'\text{N}$ and $14^{\circ}30'\text{N}$ of nearly 10 n. miles interval. Though collection of gravity, magnetic and multichannel seismic data was initially planned, only magnetic and bathymetry data could be collected along all the profiles. The gravity data could be collected only along two of the 6 profiles, whereas multichannel seismic could be collected along a small segment of profile 2. Bathymetric, magnetic and gravity data were collected over the profiles covering the EEZ. The summary of geophysical observations is given in Annex - 1.

During the cruise, position fixes at regular interval were taken with the help of Integrated Navigational System (INS) available on board the vessel. The navigational data were stored in a magnetic tape and were simultaneously printed.

Magnetic data:Total intensity magnetic data were recorded with the help of an EG & G proton precession magnetometer. The sensor was towed at a distance of nearly 250 m behind the ship. The total coverage of magnetic data was nearly 6215 line kms. Magnetic data was recorded on analogue chart recorder and the data were simultaneously stored in magnetic tapes.

Bathymetry: Bathymetric data were collected along all the 14 profiles using a deep sea echosounder. The total coverage by bathymetry was almost equal to that of magnetic data. Bathymetric data were also continuously recorded on a strip chart recorder and were also stored in magnetic tapes.

Gravity data: Gravimetric data were collected using a KSS 30 gravity meter system of Bodenseewerk, West Germany. However the system could not function properly at the end of profile 1 and was put into operation only towards the end of profile 5, as such gravity data were collected along profiles 1 and 6 as well as 7 to 14, amounting to nearly 2695 line kms. The absolute gravity data were recorded on an analogue recorder, whereas the free air, Bouger and other additional parameters such as latitude, longitude, position fix no. etc. were obtained from the printer attached to the system. The gravity data were also simultaneously stored in magnetic tapes.

Multichannel Seismics: Though this cruise was originally aimed at collecting multichannel seismic data using the Texas DFS V airgun system on board the vessel, the efforts were not successful, mainly because of the rough weather and also due to frequent failures either with the air guns or the streamer or the on board electronics. The data were collected along a small segment of profile 2 with a line coverage of nearly 400 kms.

Core samples

Core samples: The core samples were collected using the line Corer on board the vessel. The location of these Core stations are shown in the figure and they were collected at a depth of 1200 mts. and 3000 mts. respectively. The length of the core at 1200 m depth is 2.63 m and the other is 6.3 m.

(2) Top 0-100

6. PRELIMINARY RESULTS

CORE I: Top 0-100 cm is brown in colour indicating oxidising environment and its texture is clay. At 100 cm the colour changes from brown to greyish black upto the bottom of the core. Between 90 and 110 cm hard rock pieces were noticed and the texture appears to be coarser. Below this the texture of the sediment is mainly clay which is stiff and plastic. At 210 cm and 230 cms shell material was also observed.

CORE II: The top 30 cm exhibits different colours varying from dark yellowish brown (10 YR 4/2) to dark olive grey (5 Y 3/2). Texture of the surface sediment is soft sand-silt-clay. Below 30 cm the colour changes to light olive grey. The colour remains same till 140 cm with variations in sand content. Below 140 cm the colour changes from light olive grey to dark olive grey. At 140 to 150 cms more shell material was observed. The texture is mainly sandy clay. The colour remains same upto 380 cm of the core while the texture changes from sandy clay to clay between 380 to 450 cm and the colour is grey. At 450 cm a dark layer of few millimeters thickness is noticed. Such layers are observed frequently below 450 cm.

7. ACKNOWLEDGEMENTS

The Chief Scientist of the cruise wished
to express his sincere thanks to the Master,
officers and crew of ORV Sagarkanya for their
cooperation during the cruise.

ANNEX I - SUMMARY OF GEOPHYSICAL OBSERVATIONS

O.R.V. SAGER KANYA
CRUISE NO. 42

PARAMETER	Length in line kms		Total length in line kms
	long range profiles	EEZ profiles 7 to 14	
1. Bathymetry and Magnetics	3990	1225	5215
2. Gravity	1470	1225	2695
3. Multichannel Seismics	420	-	420