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

CRUISE No. 40

18th March to 16th April 1988

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

NATIONAL INSTITUTE OF OCEANOGRAPHY
(Council of Scientific & Industrial Research)
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REPORT ON

40TH OCEANOGRAPHIC CRUISE OF

O.R.V. SAGAR KANYA

(18th March to 16th April, 1988)

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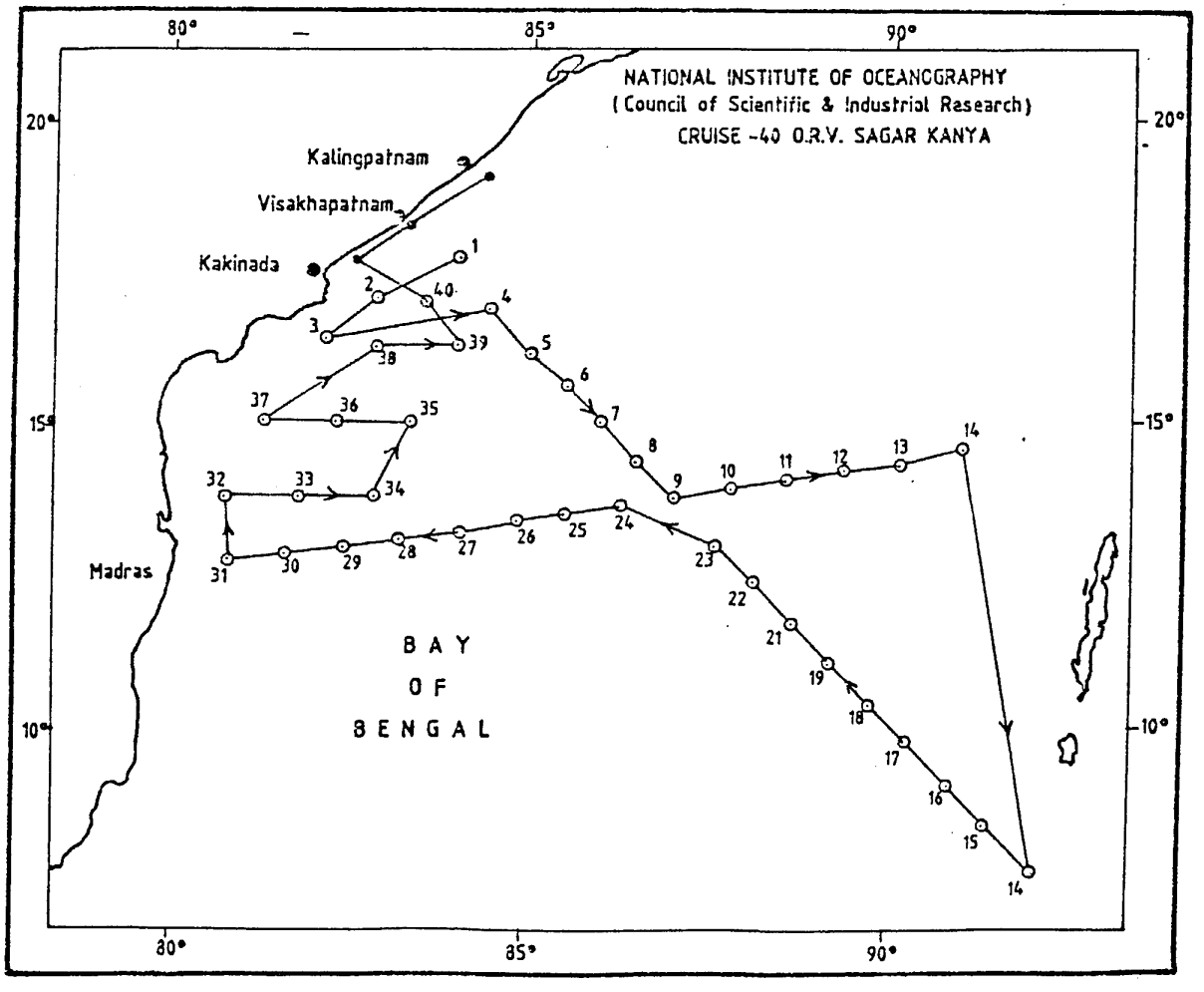
C O N T E N T S


NATIONAL INSTITUTE OF OCEANOGRAPHY
(Council of Scientific & Industrial Research)
CRUISE -40 O.R.V. SAGAR KANYA
Kalingpatnam
Visakhapatnam
Kakinada
Madras
BAY
OF
BENGAL
80°
85°
90°
20°
15°
10°

2. SUMMARY

During this cruise the ship covered a total distance of 4749 nautical miles. The studies planned were executed in two phases.

Phase 1:

a) Laying of a wave rider buoy off Karwar at a water depth of about 20 meters.

b) Laying of three current meter moorings in shallow water with depths from 30-60 meters for continuous observations on currents.

c) Laying and recovery of a deep water mooring to measure acoustic ambient noise close to SOFAR axis.

Phase 2 :

Collection of hydrographic data in the Bay of Bengal for studies connected to acoustic tomography.

In all 40 stations have been occupied and the temperature and the salinity observations were made using a digital CTD system.

Water samples in bulk quantity also have been collected from select stations for bio-chemical analysis.

During the last two days all efforts were put in to retrieve the shallow water moorings laid in phase 1.

3. PARTICIPANTS

a) Scientific component

C.S. Murty	..... Chief Scientist
N. Bahulayan Y.K. Somayajulu T.V. Ramana Murty A.K. Saran V. Krishna Kumar A.A. Michael P. Ravindran	Physical Oceanography Division, Division, NIO
N.B. Bhosle Prabha Sankaran K. Nanda Kumar Madhumati Sharma	Marine Corrosion & Material Research Division, NIO
N.M. Anand K. Ashoka Kumar K.C. Pathak P. Pednekar	Ocean Engineering Division, NIO - Disembarked at Visakhapatnam on 29.03.1988
M.S. Joshi	N.G.R.I., Hyderabad - do -
N.K. Thakur S.K. Hain	N.P.L., New Delhi - - do -
B.R. Chaubey	
Pravkar Mishra	Berhampur Univ. Joined on 29.3.88
P. Chitti Babu	Andhra Univ. Joined on 29.03.88
Paul D'Sousa	Inst. Ship Bldg. Tech., Goa.

b) Ship's Complement

Capt. M.V. Agarkar	.....	Master
C, Carneiro	.....	Chief Officer
M.A. Khot	.....	Second Officer
A. Nayyar	.....	Second Officer
R.A. Bhatt	.....	Chief Radio Officer
P,R.P. Nair	.....	Radio Officer
Dr. D.S. Murthy	.....	Medical Officer
R.G.S. D'Silva	.....	Purser
R.V. Lad	.....	Chief Engineer
K.I. Singh	.....	Second Engineer
C.T. Dharmik	.....	Third Engineer
T. Dasgupta	.....	Fifth Engineer
Mohan Wandi	.....	Electrical Officer
O.P. Bharadwaj	.....	Electrical Officer
R. Fernandes	.....	Catering Officer
A. Rodricks	.....	Asst. Catering Officer

4. OBJECTIVES

1. Carry out field measurements (on an experimental basis) on the acoustic ambient noise present at depths of 500 to 750 db using the micro processor based recorder designed and fabricated at the Physical Oceanography Division.
2. Deploy and retrieve a deep sea mooring at water depths of about 3000 m to facilitate lowering of the recorder at (1) to the desired depths.
3. Laying three moorings in shallow waters on the eastern continental shelf to measure currents close to the sea bottom and recover after 15 days for studies connected to tide and storm surge modelling.
4. Laying the wave rider buoy to collect data needed for Directional Wave Spectra measurements along the coast of Karwar for Project "Sea Bird".
5. Conduct a hydrographic survey in the region between 08°N to 17° N and 080° E to 092° E as a part of the project on ocean acoustic tomography study.
6. Collect wave data in the above (15) region for Space Application Centre, Ahmadabad.
7. Conduct a detailed survey to identify and follow the pathways of high saline waters in the western bay and along the western boundary current zone.

8. Examine the total suspended matter-particulate organic Carbon of the region (5) to evaluate the changes of transformations as a result of the transport processes, over larger spatial and time scales.

9. Provide obboard training to research students from academic Institutions.

5. CRUISE DETAILS

Participants of this cruise joined the ship during the afternoon of 18th March, 1988. The vessel sailed on the following day. The wave rider buoy was moored off Karwar around 1830 hrs. After checking for proper functioning of the marker lights of the buoy system, the vessel continued sailing towards the Bay of Bengal. On the 23rd March, work connected to the shallow water moorings was taken up. On the 26th March, 1988 the first shallow water mooring, containing one Aanderaa current meter attached 5.0 m above the sea bottom, was laid at a location - 17° 09'.2 N and 082° 44'.7 E where the water depth is 55 m. During the evening, at 16.15 hrs. one more similar shallow water mooring at 17° 46'.66N amd 83°26'.6 E was laid off Visakhapatnam at a water depth of 35 m. On the 27th March another shallow water mooring off Kalingapatnam (18° 16! 8N

and 084° 21'.4 E) was laid with one current meter 5.0 m from the sea bed. The vessel later, moved on to a position at 17°22'.6 N and 084° 18'.3 E to deploy the deep water mooring. This mooring job meant mainly to record the acoustic ambient noise in the sea for four hours duration within the sound channel was completed by 2000 hrs. on the 28th March and the vessel proceeded to Visakhapatnam to enable disembarkation of some scientists on 29.03.88 and to load the scientific equipment required for the later part of the proposed survey.

The ship subsequent to the collection of scientific equipments and the joining of two trainee scientists from Berhampur and Andhra Universities, left the harbour on 30th morning and was busy completing the task till 16th April with the last two days completely assigned to recovery of the shallow water moorings laid in the first phase of the expedition. In all, 40 stations were occupied for the collection of physical,oceanographic data using digital conductivity - temperature - depth recorder - with profiles being taken upto the near bottom depths whenever possible. On the whole, 1,15,058 m of vertical profiles of temperature and salinity each were made. In addition, water samples were collected at five stations from the upper 1000 m to study the bio-chemical aspects. The details of operations stationwise are shown in the

table. Work on the samples collected and the T,S profiles obtained was taken up.

Sound speed profiles, from the continuous data on temperature and salinity obtained from the transects enclosed (cruise track) during the survey were constructed. Work on the ray - tracing was carried out to identify source/receiver locations for application to tomography studies. On the whole 300 hrs of CPU time on HP 1000 system was made use of during this study.

6. PERFORMANCE ANALYSIS:

The winches and the cranes used for lowering the equipment worked satisfactorily during the cruise.

The unsheathed hydrographic cable of the Double Winch requires maintenance and also replacement.

7. LOSSES/DAMAGES

a. A padlock used as a additional locking system to the electronics laboratory was removed by cutting with a saw and the new lock was put on.

b. Holders of the side - end caps of two Niskin bottles were broken after touching the ship's side due to rough seas.

c. The shallow water moorings laid off Kakinada and Visakhapatnam were considered lost after repeated survey and search operations exceeding six hours each.

d. Approximately 60 m long synthetic coated cable of the dual winch was cut off due to kinks.

8. SPECIFIC RECOMMENDATIONS:

1. Computer systems to be updated.
2. One plotter for IBM PC system to be arranged
3. The diagnostic master disketterfor IBM PC on board the vessel should be made available to rectify any possible systems errors or reinitiate the system during the cruising time.
4. Winches and the cables be kept oiled.

9. ACKNOWLEDGEMENT

The Chief Scientist and other participants are grateful to the Master, Officers and crew for their co-operation during the cruise.

ORV SAGAR KANYA

Cruise No: 40 From: 19.03.1988 to 16 .04.1988.

SUMMARY OF OBSERVATIONS

S.No.	Date	Time of start IST	Time of end	Sonic depth m	Latitude	Longitude	CSTD	C:M	Waves	Water samples
01	30.03.88	1150	1759	2662	17°12.44	84°03.48	yes	yes	yes	yes
02	31.03.88	0505	0652	2373	16°40.10	87°09.39	yes	-	yes	-
03	31.03.88	1640	1750	1335	16°06.78	89°17.91	yes	-	yes	-
04	01.04.88	2300	0030	3000	16°31.23	84°21.39	yes	yes	yes	-
05	01.04.88	1525	1720	2950	15°54.71	84°59.92	yes	-	yes	-
06	01.04.88	2203	2345	2916	15°30.25	85°31.79	yes	-	yes	-
07	02.04.88	0445	0645	2915	15°02.14	86°04.32	yes	-	yes	-
08	02.04.88	1116	1252	3000	14°30.00	86°29.10	yes	-	yes	-
09	02.04.88	1715	2315	3017	14°00.07	87°00.01	yes	yes	yes	yes
10	04.04.88	0455	0615	2992	13°10,04	87°50.35	yes	-	yes	-
11	03.04.88	1110	1350	2960	14°15.00	88°34.72	yes	-	yes	-
12	03.04.88	1800	2010	2840	14°25.00	89°20.00	yes	yes	yes	-
13	04.04.88	0210	0415	2775	14°34.04	90°10.00	yes	-	yes	-
14	04.04.88	0955	1450	2765	14° 42.00	90°59.69	yes	yes	yes	yes
15	05.04.88	0210	0725	2386	09°00.02	92°00.09	yes	yes	yes	yes
16	06.04.88	1340	1610	3620	09°44.98	91°21.59	yes	-	yes	-
17	06.04.88	2027	2205	3384	10°15.01	90°49.89	yes	-	yes	-
18	07.04.88	0300	0423	3250	10°39.80	90°17.63	yes	yes	yes	-
19	07.04.88	0930	1200	3190	11°09.15	89°50.36	yes	-	yes	-
20	07.04.88	1720	1855	3200	11°49.70	89°19.44	yes	-	yes	-
1	2	3	4	5	6	7	8	9	10	11

1	2	3	4	5	6	7	8	9	10	11
21	07.04.88	2330	0205	3204	12°19.91	88°38.67	yes	-	yes	-
22	08.04.88	0600	0735	3093	12°44.98	88°06.82	yes	-	yes	-
23	08.04.88	1315	1455	3086	13°25.01	87°24.75	yes	-	yes	-
24	09.04.88	0040	0215	3100	13°55.00	86°10.98	yes	-	yes	-
25	09.04.88	0705	0830	3140	13°50.11	85°32.00	yes	-	yes	-
26	09.04.88	1235	1455	3138	13°45.36	84°55.81	yes	-	yes	-
27	09.04.88	2005	2215	3282	13°29.34	84°06.35	yes	yes	yes	-
28	10.04.88	0250	0425	3085	13°24.80	83°19.80	yes	-	yes	-
29	10.04.88	0825	0930	3200	13°19.92	82°37.52	yes	-	yes	-
30	10.04.88	1515	1645	3460	13°12.04	81°49.96	yes	-	yes	-
31	10.04.88	2210	2400	3430	13°07.72	81°03.14	yes	-	yes	-
32	11.04.88	0540	1045	3149	13°59.88	81°00.09	yes	yes	yes	yes
33	11.04.88	1745	1935	3379	13°57.71	81°57.63	yes	-	yes	yes
34	12.04.88	0230	0415	3365	14°00.01	83°00.07	yes	-	yes	-
35	12.04.88	1137	1340	3200	15°00.56	83°28.02	yes	-	yes	-
36	12.04.88	1910	2040	3090	15°00.00	82°30.07	yes	-	yes	-
37	13.04.88	0230	0350	2730	15°00.00	81°29.91	yes	-	yes	-
38	13.04.88	1430	1545	2760	16°00.03	83°00.06	yes	-	yes	-
39	13.04.88	2121	2331	3090	16°00.10	83°59.97	yes	-	yes	-
40	14.04.88	0605	0745	2715	16°38.23	83°22.10	yes	-	yes	-