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)
Dona Paula, Goa-403 004

REPORT ON

40TH OCEANOGRAPHIC CRUISE OF

O.R.V. SAGAR KANYA

(18th March to 16th April, 1988)
REPORT ON THE 40TH OCEANOGRAPHIC CRUISE OF
O.R.V. SAGAR KANYA

CONTENTS

1. Cruise track
2. Cruise summary
3. Participants
   a. Scientific component
   b. Ship's complement
4. Objectives
5. Cruise details
6. Boats/Damages Analysis
7. Losses/Damages
8. Specific Recommendations
9. Acknowledgement

Annex - Summary of observations
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

N. Bahulayan
Y.K. Somayajulu
T.V. Ramana Murty
A.K. Saran
V. Krishna Kumar
A.A. Michael
P. Ravindran

N.B. Bhosle
Prabha Sankaran
K. Nanda Kumar
Madhumati Sharma

N.M. Anand
K. Ashoka Kumar
K.C. Pathak
P. Pednekar
M.S. Joshi
N.K. Thakur
S.K. Main
D.R. Chaubey
Pravkar Mishra
P. Chitti Babu
Paul D'Sousa

..... Chief Scientist

Physical Oceanography Division,
Division, NIO

Marine Corrosion & Material
Research Division, NIO

Ocean Engineering
Division, NIO - Disembarked at
Visakhapatnam
on 29.03.1988

N.G.R.I., Hyderabad - do-

N.P.L., New Delhi - do-

Berhampur Univ. Joined on 29.3.88
Andhra Univ. Joined on 29.03.88
b) **Ship's Complement**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capt. M.V. Agarkar</td>
<td>Master</td>
</tr>
<tr>
<td>C. Carneiro</td>
<td>Chief Officer</td>
</tr>
<tr>
<td>M.A. Khot</td>
<td>Second Officer</td>
</tr>
<tr>
<td>A. Nayyar</td>
<td>Second Officer</td>
</tr>
<tr>
<td>R.A. Bhatt</td>
<td>Chief Radio Officer</td>
</tr>
<tr>
<td>P.R.P. Nair</td>
<td>Radio Officer</td>
</tr>
<tr>
<td>Dr. D.S. Murthy</td>
<td>Medical Officer</td>
</tr>
<tr>
<td>R.G.S. D'Silva</td>
<td>Purser</td>
</tr>
<tr>
<td>R.V. Lad</td>
<td>Chief Engineer</td>
</tr>
<tr>
<td>K.I. Singh</td>
<td>Second Engineer</td>
</tr>
<tr>
<td>C.T. Dharmik</td>
<td>Third Engineer</td>
</tr>
<tr>
<td>T. Dasgupta</td>
<td>Fifth Engineer</td>
</tr>
<tr>
<td>Mohan Rwandi</td>
<td>Electrical Officer</td>
</tr>
<tr>
<td>O.P. Bharadwaj</td>
<td>Electrical Officer</td>
</tr>
<tr>
<td>R. Fernandes</td>
<td>Catering Officer</td>
</tr>
<tr>
<td>A. Rodrigues</td>
<td>Asst. Catering Officer</td>
</tr>
</tbody>
</table>
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 on-board 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 and 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.

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.

DESE ASSESSMENT

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, resulting in a loss of six days each.
4. 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 disketter for 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.
<table>
<thead>
<tr>
<th>Date</th>
<th>Time of</th>
<th>Sonic depth</th>
<th>Longitude</th>
<th>Summary of Observations</th>
<th>Later samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>30.03.98</td>
<td>8:00</td>
<td>2662</td>
<td>126.38</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>31.03.98</td>
<td>9:30</td>
<td>2777</td>
<td>126.40</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>31.03.98</td>
<td>10:30</td>
<td>3000</td>
<td>126.40</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>01.04.98</td>
<td>11:00</td>
<td>2850</td>
<td>126.40</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>01.04.98</td>
<td>12:00</td>
<td>2916</td>
<td>126.40</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>01.04.98</td>
<td>13:00</td>
<td>2915</td>
<td>126.40</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>01.04.98</td>
<td>14:00</td>
<td>3017</td>
<td>126.40</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>01.04.98</td>
<td>15:00</td>
<td>3117</td>
<td>126.40</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>02.04.98</td>
<td>00:00</td>
<td>3117</td>
<td>126.40</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>02.04.98</td>
<td>01:00</td>
<td>2952</td>
<td>126.40</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>02.04.98</td>
<td>02:00</td>
<td>2680</td>
<td>126.40</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>02.04.98</td>
<td>03:00</td>
<td>2640</td>
<td>126.40</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>02.04.98</td>
<td>04:00</td>
<td>2775</td>
<td>126.40</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>02.04.98</td>
<td>05:00</td>
<td>2765</td>
<td>126.40</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>02.04.98</td>
<td>06:00</td>
<td>2862</td>
<td>126.40</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>02.04.98</td>
<td>07:00</td>
<td>3024</td>
<td>126.40</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>02.04.98</td>
<td>08:00</td>
<td>3349</td>
<td>126.40</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>02.04.98</td>
<td>09:00</td>
<td>3163</td>
<td>126.40</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>02.04.98</td>
<td>10:00</td>
<td>3120</td>
<td>126.40</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>