CRUISE REPORT

ORV SAGAR KANY

Cruise No. 13

(15-23 January, 199

राष्ट्रीय समुद्र विज्ञान
संस्थान

NATIONAL INSTITUTE
OF
OCEANOGRAPHY

ORV SAGAR KANYA

Cruise No. 131

(15-23 January, 1998)

NATIONAL INSTITUTE OF OCEANOGRAPHY

(Council of Scientific and Industrial Research)

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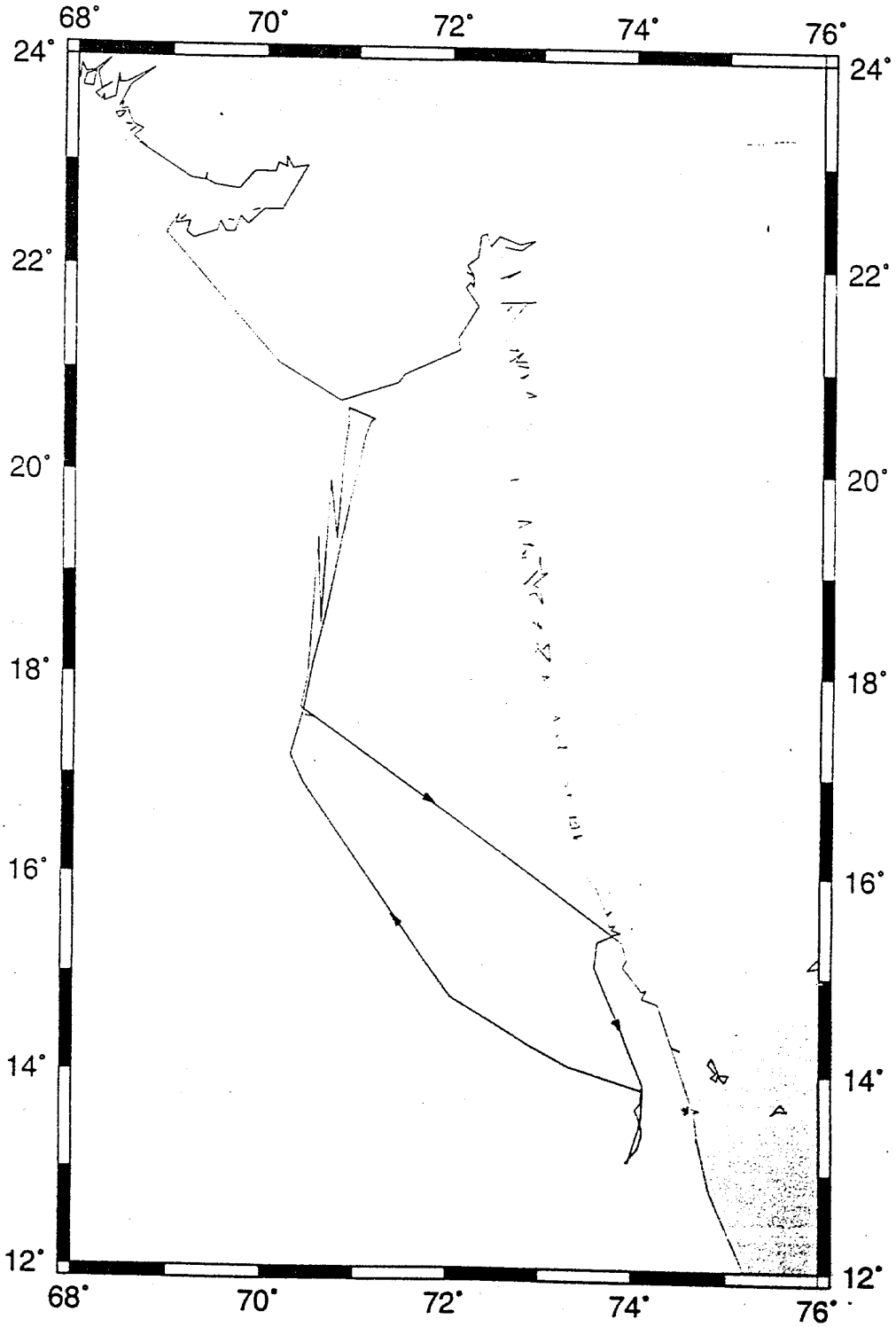
REPORT ON THE 131ST OCEANOGRAPHIC CRUISE OF ORV *SAGAR KANYA*

CONTENTS

Cruise track of SK131

(Validation of IRS P3 - MOS)



2. CRUISE SUMMARY

The cruise was a part of the validation campaign of the ocean colour sensor MOS, on board the Indian Remote Sensing Satellite, (IRS-P3). Cruise participants were drawn from the Space Applications Centre (Ahmedabad), Physical Research Laboratory (Ahmedabad), National Remote Sensing Agency, Hyderabad and Fishery Survey of India, Mormugao, besides NIO.

Scientific work consisted of simultaneous measurement of radiation, biological parameters such as chlorophyll and suspended sediments and atmospheric measurements on optical depth and surface meteorological parameters. The bottle closing mechanism of CTD failed to function after the first ocean colour station south-west of Goa. Hence, biological sampling was restricted to surface waters. The area of operation was southwest of Goa and south of Saurashtra coast covering path numbers 92 and 96 of IRS-P3.

The ship left Mormugao on January 15, 1998 with 17 scientists on board. The sea was slightly rough with white caps appearing from time to time. Sky was occasionally cloudy. Northern region of the cruise track off Saurashtra coast was cold and windy with SSTs falling to less than 23°C. In all, 7 ocean colour stations, 39 stations for atmospheric parameters and 26 observations for surface meteorological parameters were conducted. The cruise ended on January 23, 1998 at the same harbour.

3. PARTICIPANTS

3.1 Scientific component

P.V. Sathe (*Chief Scientist*)	)	
S.G.P. Matondkar	)	
E. Pattabhi Ramarao	)	
T. Suresh	)	
Namita Jadhav	)	National Institute of Oceanography,
Lorna Gonsalves	)	Goa
Sanjay Khedekar	)	
G. Chandwale	)	
G.G. Kankonkar	)	
M. Mohan	)	
Mini Raman	)	Space Application Centre, Ahmedabad
Beena Kumari	)	
H.U. Solanki	)	
J.T. Vinchi	—	Physical Research Laboratory, Ahmedabad
K.H. Rao	)	National Remote Sensing Agency,
S.B. Choudhary	)	Hyderabad
S.K. Naik	)	Fishery Survey of India, Mormugao
K.C. Rajeev	)	M/s NORINCO, Vasco
K.M. Jayakrishna	)	

3.2 Ship's complement

Capt. N. Sreekumar	—	Master
S.P. Sahoo	—	Chief Officer
P.S. Madhavan	—	2nd Officer
Aniruddha Home	—	Chief Engineer
G. Ganguli	—	2nd Engineer
P. Sreedharan	—	Electrical Officer
G.S. Nagarcenkar	—	Radio Officer
G.C. Jacques	—	Purser
I.R. Vaz	—	Catering Officer

4. INTRODUCTION

The cruise was a part of a special campaign for validation of the ocean colour sensor MOS, (Modular Optoelectronic Scanner) on board the Indian Remote Sensing Satellite, (IRS P3), launched on March 21, 1996. This was the sixth cruise under the campaign. The first five cruises organized earlier were in February, April and December 1996 and April and October 1997. During April 1997, Sagar Sampada had joined the campaign from Cochin to simultaneously cover the southern Arabian sea, while during October 1997, FSI vessel *Yellow Fin* was requisitioned for covering shallow waters off Porbundar (Gujarat).

Two paths of IRS P3, namely, path numbers 92 and 96 had their ground traces falling within the area of observation and they were planned to be covered during the cruise.

5. CRUISE DETAILS

The objective of the cruise was to collect synchronous seatruth for the ocean colour sensor MOS on board the Indian satellite IRS P-3 and to increase the data base for development/refinement of retrieval algorithms for biological parameters. Simultaneous measurements of radiation upwelling from the sea, quality of seawater in terms of its various constituents that alter the spectral character of the outgoing radiation and meteorological parameters are required for this purpose. The cruise was planned to collect such data at the various locations in the sea along satellite passes. Path numbers 92 and 96 of IRS P-3 were planned to be covered.

The ship sailed from Mormugao on January 15, 1998 at 1815 hrs with 17 scientists and 2 technicians from M/s NORINCO on board. This was a multidisciplinary cruise comprising optical oceanographers, biologists, space physicists and ocean remote sensing scientists. The team from IMD could not participate.

The first ocean colour station was covered immediately on the next morning (16-1-1998) at 1000 hrs along the path 96 of IRS P3. It was a synchronous station. Surface meteorological observations also began simultaneously and continued throughout the cruise. Annexure-1 gives station locations and schedule for all surface meteorological observations conducted.

Radiation measurements consisted of recording of spectral character of upwelling and downwelling light at various depths in the range from 350 to 850 nm using LICOR underwater radiometer. Besides, AC 9 meter was used to measure backscattering coefficients in selected wavelengths at various depths.

At all locations where ocean colour measurements were made, simultaneous biological observations were also taken. These included chlorophyll and pheopigment concentration, primary production and total suspended sediments. SST and surface met. observations were also supplemented at every ocean colour station. Wind speed in particular was measured repeatedly during the ocean colour stations. The locations and schedule of ocean colour stations are given in annexure-2.

Bottle opening mechanism of CTD failed to function after the first ocean colour station. As a result, sampling had to be restricted to surface/subsurface waters. Several coastal stations covered had a depth not exceeding 20 meters in choppy waters off Saurashtra coast and hence biological sampling in surface-waters could give fairly good data for the purpose of validation.

Atmospheric measurements consist of studies on aerosol concentration, their size distribution and optical depths of the atmosphere. The optical depths of atmosphere were measured in five wavelengths, viz, 399, 497, 667, 848 and 1051 nm. These

observations began on January 16 at 0800 hrs and continued throughout the cruise. The locations and schedule of stations for atmospheric measurements are given in annexure-3.

The cruise covered two satellite passes along the path no 96 and 92. Path 96 was south west of Goa while path 92, south of Saurashtra coast. The weather was very cool along path 96 with sea surface temperatures dropping to less than 23°C and sky was occasionally cloudy. The cruise came to an end on 23rd January at Mormugao.

6. PERFORMANCE OF ONBOARD EQUIPMENTS

The bottle closing mechanism of CTD failed to function during the cruise. This could not be set right despite efforts by M/s NORINCO personnel on board. This made us to restrict the biological sampling in surface/subsurface waters.

Shortage of PCs was felt during the cruise since every other instrument required a dedicated PC. Besides, PCs are required onboard for downloading of data as well as for other routine computations.

7. ACKNOWLEDGEMENTS

The cruise participants are thankful to Department of Ocean Development for making *SAGAR KANYA* available for the validation exercise. Thanks are also due to the Master of the vessel and his officers and crew for excellent cooperation extended during the cruise.

Annexure I

Station locations and schedule for surface met. observations

Sr No	Date (98)	Time (hrs)	Latitude (N)	Longitude (E)
01	16/01	1045	13:40.2	74:02.5
02	16/01	1130	13.38.7	74:02.7
03	16/01	1315	13:40.6	74:00.1
04	16/01	1430	13:35.2	74:03.5
05	16/01	1730	13:31.9	74:05.0
06	17/01	0900	13:05.8	73:56.7
07	17/01	1130	13:10.2	73:58.0
08	17/01	1730	13:36.8	74:08.5
09	18/01	0900	14:46.2	72:02.6
10	18/01	1130	15:05.6	71:46.7
11	18/01	1730	15:53.4	71:11.5
12	19/01	0900	18:07.0	70:32.3
13	19/01	1130	18:29.7	70:38.5
14	19/01	1545	19:02.9	70:46.9
15	20/01	0900	20:30.3	71:10.5
16	20/01	1030	20:32.9	71:14.3
17	20/01	1100	20:32.9	71:14.3
18	20/01	1130	20:31.3	71:12.1
19	20/01	1200	20:31.3	71:14.3
20	20/01	1230	20:31.3	71:12.1
21	20/01	1430	20:36.7	70:55.2
22	20/01	1545	20:30.8	70:52.8
23	20/01	1800	20:33.0	70:54.7
24	21/01	0900	18:29.0	70:36.7
25	21/01	1130	18:21.4	70:35.3
26	21/01	1430	18:02.0	70:30.0

Annexure 2

Station locations and schedule for ocean colour stations

Sr No	Date 1998	Time hrs	Latitude (N)	Longitude (E)
1	16/01	1000-1500	13:40.2	74:02.0
2	17/01	1000-1130	13:05.8	73:56.8
3	17/01	1545-1745	13:37.6	74:08.4
4	19/01	1530-1830	19:03.3	70:46.8
5	20/01	1015-1230	20:33.3	71:14.9
6	20/01	1530-1730	20:38.1	70:52.7
7	21/01	1000-1215	18:23.1	70:35.8

Annexure 3

Station locations and schedule for atmospheric observations

Sr No (1)	Date 1998 (2)	Time hrs (3)	Latitude Deg N (4)	Longitude Deg E (5)
1	16/01	0802	13:43	74:06
2	16/01	0940	13:40	74:03
3	16/01	1106	13:39	74:03
4	16/01	1300	13:45	73:57
5	16/01	1600	13:34	74:05
6	16/01	1719	13:32	74:05
7	17/01	0759	13:22	73:57
8	17/01	0920	13:06	73:57
9	17/01	1130	13:06	73:57
10	17/01	1210	13:07	73:59
11	17/01	1403	13:23	74:04

(continued)

1	2	3	4	5
12	17/01	1600	13:23	74:04
13	17/01	1741	13:36	74:09
14	18/01	0746	14:40	72:14
15	18/01	0919	14:48	72:00
16	18/01	1119	15:04	71:48
17	18/01	1425	15:29	71:30
18	18/01	1648	15:48	71:15
		Sky became very cloudy for the rest of the day		
19	19/01	0748	17:55	70:29
20	19/01	1037	18:21	70:36
21	19/01	1207	18:35	70:40
22	19/01	1312	18:45	70:42
23	19/01	1402	18:52	70:44
24	19/01	1530	19:03	70:47
25	19/01	1720	19:02	70:47
26	20/01	0744	20:28	71:07
27	20/01	1013	20:33	71:15
28	20/01	1216	20:31	71:10
29	20/01	1406	20:36	70:57
30	20/01	1535	20:38	70:53
31	20/01	1735	20:31	70:55
32	21/01	0751	18:40	70:39
33	21/01	0914	18:28	70:37
34	21/01	1005	18:23	70:36
35	21/01	1621	17:45	70:26
36	22/01	0752	16:22	71:21
37	22/01	1136	16:09	71:52
38	22/01	1324	16:07	72:07
39	22/01	1426	16:07	72:16