

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

CRUISE No. 53

19th July to 2nd September 1989



**National Institute of Oceanography
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INDIA**

NATIONAL INSTITUTE OF OCEANOGRAPHY
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Dona Paula, Goa

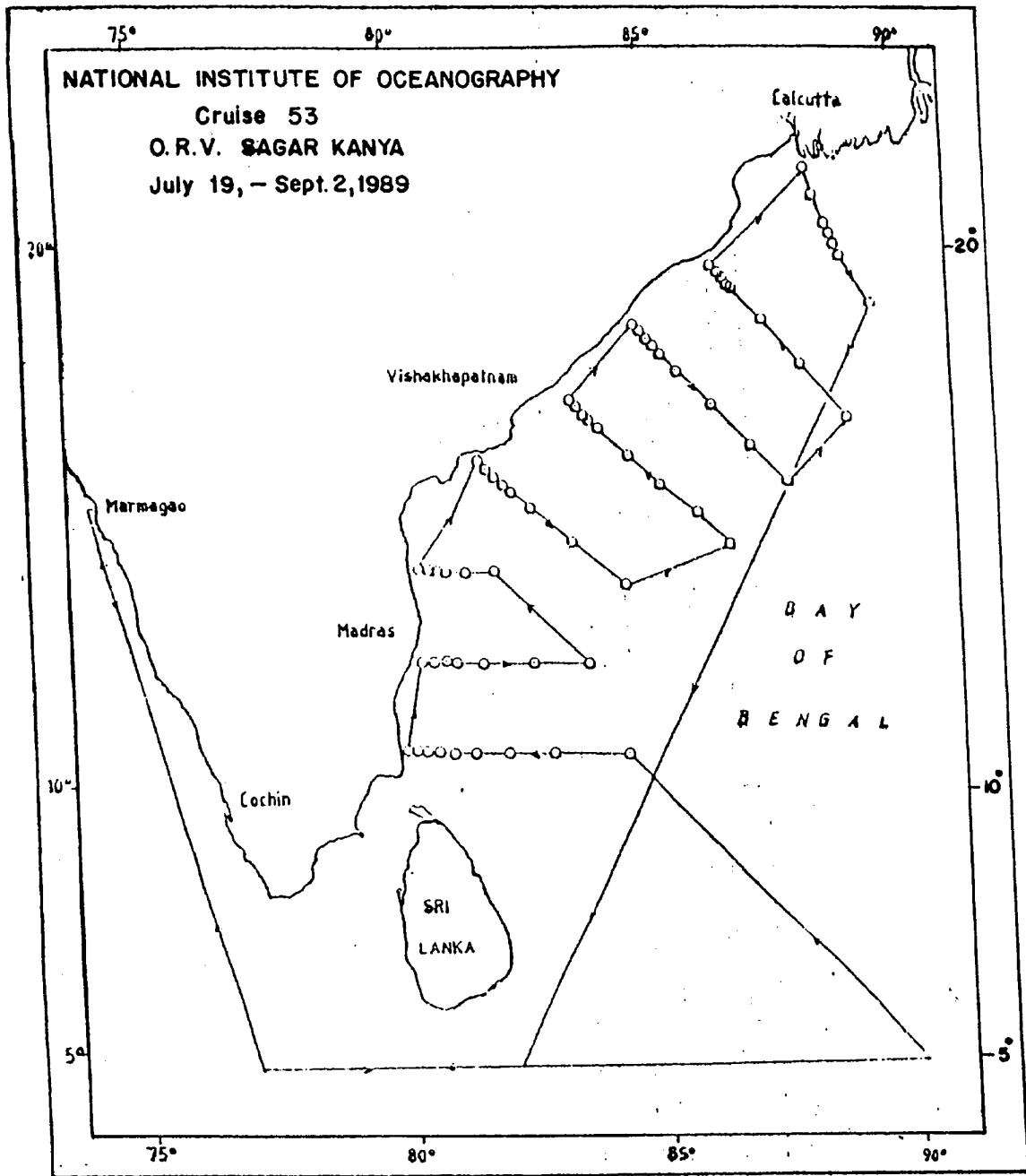
REPORT ON
53RD OCEANOGRAPHIC CRUISE OF
O.R.V. SAGAR KANYA

(10 July to ~~2 September~~, 1989)

REPORT ON THE 53RD OCEANOGRAPHIC CRUISE OF
O.R.V. SAGAR KANYA

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2. SUMMARY

The cruise was designed to collect data on physical, chemical and biological events in the Exclusive Economic Zone of the East Coast of India during the SW monsoon. The ship sailed off Mormugao on 19 July, 1989 and returned to Cochin on 2 September, 1989.

Hydrological data indicated the presence of upwelling along the continental slope. The signal for upwelling decreased further north possibly due to heavy land runoff. Chemical data on nutrient variations showed similar phenomena. High chlorophyll a and probably productivity near the shore were observed. Light intensity was variable depending on cloud cover and weather.

Meteorological data was routinely transmitted to IMD, New Delhi. Radio Sonde observations were done twice a day except when the ship was within radar range of land meteorological installations.

3. PARTICIPANTS

a) Scientific Component

A. Pant Chief Scientist
S. Shetye	
S.S.C. Shenoi	
D. Sundar	
G.S. Michael	
G. Nampoothiri	
R. Noronha	
Maheshwari Nair	
H. Dalvi	
R.A. Sreepada	

b) Ship's complement

M.S.L. Fernandes	... Master
B.K. Adhwarya	... Chief Officer
S. Shekhadkar	... Second Officer
D.K. Uchil	... Chief Radio Officer
S. Samaddar	... Second Radio Officer
D.N. Rao	... Medical Officer
R.H. Almeida	... Purser
R. Sethi	... T.N.O.
R.M. Fernandes	... Cattering Officer
A. Dias	... Asst. Catering Officer
K.K. Ray	... Chief Engineer
P.R.S. Nair	... Second Engineer Officer
S.K. Misra	... Third Engineer
A. Dias	... Fifth Engineer

4. OBJECTIVES OF THE CRUISE

The cruise was designed to investigate.

- a) Coastal circulation in the eastern EEZ of India
- b) To determine variations in nutrients of interest and to determine their distribution in relation to coastal circulation dynamics.
- c) To determine variations in chlorophyll a biomass and productivity in relation to chemistry and hydrology of the region.
- d) To collect meteorological data during the Southwest monsoon.

5. CRUISE DETAILS

This cruise was one of the two designed to investigate time dependant coastal circulation and variations in chemical and biological parameters of the Exclusive Economic Zone of the eastern seaboard of the Indian Coast with particular reference to the south-west and north-east monsoons. However, the ship though scheduled to sail on 13/7/89 sailed from Mormugao on the 19th at 1100 hrs due to non-availability of second navigating officer on board and the participants started the scheduled work programme at 11°N 84°E on 24th July, 1989 at 1330 hrs. The sampling programme at the last

station, 20° 58.46'N 88°08.72'E, was completed on 15th August, 1989 at 0152 hours. As planned, a total of 91 stations were occupied during the programme.

Hydrological data was collected at all stations to the maximum depth. Nitrate, nitrite and phosphate and other hydrochemical data were taken at 56 stations. Chlorophyll a, and primary production were measured at 57 stations at 5 depths and benthic sampling was done with the Peterson grab at all shallow stations. Radiosonde observations were taken by IMD participants twice a day and 6 hourly observations on SST, wind speed and direction and humidity were recorded and transmitted to IMD, New Delhi.

Hydrological data indicated the presence of upwelling along the continental slope. The signal for upwelling decreased further north possibly due to heavy land run-off. Chemical data on nutrient variation showed similar phenomena. Chlorophyll a distributions suggested high productivity near the shore, but the rate of carbon assimilation was likely to be affected by available nutrients and low light intensity. Light intensity was variable depending on cloud cover in the Bay of Bengal during the monsoon cruise.

The scheduled plan of work was completed incident free in spite of the heavy leakages of oil from the A-frame. The apparent break of the oil seal had been reported to the ship

cell earlier. The generators were tripping quite frequently during the voyage. The Chief Engineer suggested that this might be due to bad quality of oil which was full of particulate matter necessitating frequent cleaning of the oil filters on the generators.

On 21st August at 1855 hrs the scientists responded to the general alarm on the ship by donning life jackets and reporting on the boat deck. It was understood that there was a major fire in the engine room. The ship was 06°28'.5 N 79° 20'.0E at a depth of 2000 m. Barberyn light house had been sighted on the coast of Sri Lanka. At 2005 hours the Captain decided to flood the generator room with CO₂ as advised by the Chief Engineer after other fire fighting measures had failed. Man entry was effected at 1145 hours on 22 August with breathing apparatus and face masks to confirm that the fire was out.

This preliminary check revealed that:

- a) The fire had started at generator 4 which was very severely damaged
- b) Generators 3 & 5 on either side of 4 were severely damaged and
- c) it might be possible to restart generators 1 & 2.

More detailed investigations on 22nd August evening after the CO₂ and smoke were partially evacuated, showed

severe damage to all cables and the impossibility of re-starting generators 1 & 2. On 22nd August 1500 hours Sagar Kanya anchored at 06° 13.5 N 79° 56'.6 E, 6 miles off Sri Lanka having drifted to the region shallow enough for the purpose. There was a second fire alarm at 0130 hrs on 23rd August. On checking in engine room this was found to be a false alarm. The M.V. ANVESHAK removed the scientists and other personnel from the ORV SAGAR KANYA and returned to Cochin on the 2nd September. Scientific equipment and samples were removed by the R.V. Gaveshani two days later.

6. LOSSES/DAMAGES

One messenger and two torches were lost during the cruise.

SUMMARY OF OBSERVATIONS

Stn. No.	Lat.	Long.	TA	Depth		Production		GRAB	NET	SECCHI	SHIPS
				BT	DEEP	SHALLOW	DEEP				
1-12	10°59'.96 N	083°59'.35E	1330	24 July	3500	+	+	-	+	+	1940
1-11	10°58'.51 N	082°58'.32E	0230	25 July	3525	+	+	-	-	-	1025
1-10	10°59'.25 N	081°58'.96E	1720	25 July	3600	-	+	-	+	-	2135
1-9	11°00'.00 N	081°02'.22E	0300	26 July	3390	+	+	-	+	-	0720
1-8	10°55'.05 N	080°47'.89E	0900	26 July	3100	-	+	-	-	-	1225
1-7	10°51'.74 N	080°37'.11E	1330	26 July	1330	-	+	+	+	-	1655
1-6	10°49'.01 N	080°28'.07E	1823	26 July	620	-	+	-	-	-	1938
1-4	10°47'.50 N	080°16'.25E	2040	26 July	250	-	+	+	+	+	2220
1-3	10°44'.36 N	080°12'.47E	2330	26 July	150	+	+	+(2)	-	-	0031
1-2	10°42'.18 N	080°00'.50E	0110	27 July	52	-	+	+(2)	+	-	0220
1-1	10°40'.97 N	080°01'.05E	0255	27 July	17	-	+	+	+	-	0336
2-1	12°42'.81 N	080°18'.77E	1706	27 July	40	-	+	+	+	-	1810
2-2	12°41'.99 N	080°28'.68E	1943	27 July	73	-	+	+	+	-	2035
2-3	12°40'.92 N	080°33'.49E	2110	27 July	90	-	+	+	+	-	2153
2-4	12°39'.56 N	080°39'.52E	2300	27 July	160	-	+	+	-	-	2352
2-5	12°39'.40 N	080°45'.07E	0055	28 July	1310	-	+	-	-	-	0302
2-6	12°38'.43 N	080°50'.90E	0355	28 July	3150	-	+	-	+(2)	-	0840
2-7	12°36'.67 N	080°58'.54E	0930	28 July	3325	-	+	-	+	+	1255
2-8	12°36'.39 N	081°10'.22E	1425	28 July	3300	-	+	-	+	-	1810

2-9	12°36'.14 N	081°31'.62E	2100	28 July	3450	-	+	+	+	-	+	-	0045
2-10	12°30'.06 N	081°59'.69 E	0330	29 July	3470	-	+	+	-	-	-	-	0710
2-11	12°28'.78 N	082°59'.21E	1415	29 July	3385	+	+	+	+	-	-	+	1761
2-12	12°29'.55 N	083°59'.97E	0030	30 July	3350	+	+	+	+	-	+	-	0416

TO MADRAS TO DISENBARK SICK 4TH ENGINEER HALT AT OUTER ANCHORAGE, SAILED AT 1200 on 31/7/69

3-2	14°00'.21 N	080°20'.60E	2142	31 July	36	+	+	-	-	+	+	-	2230
3-3	14°00'.04 N	080°25'.52E	2308	31 July	180	+	+	-	+	+	-	-	0022
3-4	13°59'.97 N	080°30'.84E	0110	1 AUG	1140	-	+	-	-	+	+	-	0254
3-5	13°59'.87 N	080°36'.33E	0340	1 Aug	2440	+	+	+	-	-	-	-	0540
3-6	14°00'.08 N	080°41'.95E	0728	1 Aug	2040	+	+	+	+	-	+	+	1032
3-7	14°00'.09 N	080°50'.19E	1135	1 Aug	2970	-	+	+	-	-	-	+	1419
3-8	13°58'.89 N	081°20'.97E	1545	1 Aug	3100	-	+	+	+	-	+	-	1905
3-9	13°59'.61 N	081°19'.98E	2100	1 Aug	3200	-	+	+	+	-	+	-	2330
3-10	13°59'.87 N	081°47'.78E	0309	2 Aug	3290	-	+	+	+	-	+	-	0635
3-11	14°00'.51 N	082°22'.80E	0940	2 Aug	3300	-	+	+	+	-	+	-	1250
3-12	14°00'.19 N	083°00'.18'E	1537	2 Aug	3500	-	+	+	+	-	+	-	1912
4-10	14°30'.01 N	082°44'.21'E	2330	2 Aug	3200	-	+	+	+	-	+	-	0306
4-9	14°55'.19 N	082°33'.20'E	0720	3 Aug	3100	-	+	+	+(2)	-	+	-	1045
4-8	15°19'.79 N	082°20'.29'E	1430	3 Aug	2800	-	+	+	+	-	-	-	1712
4-7	15°32'.10 N	082°12'.78'E	1919	3 Aug	2500	-	+	+	+	-	+	-	2143
4-6	15°32'.10 N	082°06'.71'E	2255	3 Aug	2090	-	+	+	-	-	-	-	0050
4-5	15°50'.01 N	082°4'.16'E	0158	4 Aug	1320	-	+	+	+	-	-	-	0416
4-4	15°55'.18 N	082°01'.12'E	0534	4 Aug	1180	-	+	+	-	-	+	-	0746
4-3	16°02'.07 N	081°58'.73'E	0900	4 Aug	600	+	+	-	+	+	-	-	1030
4-2	16°07'.09 N	081°55'.36'E	1135	4 Aug	270	+	+	-	+	+	+	+	1307
4-1	16°14'.89 N	081°52'.91'E	1400	4 Aug	23	+	+	-	-	+	+	-	1447
5-1	17°24'.24 N	083°14'.14'E	0200	5 Aug	63	+	+	-	-	+	+	-	0302
5-2	17°16'.98 N	083°19'.27'E	1600	5 Aug	100	+	+	-	+	+	+	-	0516
5-3	17°13'.37 N	083°22'.93'E	0600	5 Aug	167	-	+	+	-	-	-	-	0742
5-4	17°10'.48 N	083°24'.51'E	0823	5 Aug	400	-	+	-	-	-	-	-	0950
5-5	17°06'.51 N	083°27'.58'E	1038	5 Aug	1100	+	+	+	+	-	-	+	1232
5-6	17°02'.51 N	083°31'.07'E	1315	5 Aug	2330	+	+	+	-	-	-	-	1530
5-7	16°55'.78 N	083°35'.62'E	1630	5 Aug	2650	-	+	+	+	-	+	-	1940
5-8	16°48'.85 N	083°42'.16'E	2040	5 Aug	2875	-	+	+	-9	-	+	-	2317
5-9	16°34'.11 N	083°53'.13'E	0137	6 Aug	2980	+	+	+	+	-	-	-	0505
5-10	16°16'.15 N	084°05'.96'E	0049	6 Aug	3025	-	+	+	+	-	+	+	1215
5-11	15°54'.91 N	084°22'.91'E	1545	6 Aug	2990	-	+	+	+	-	+	-	1855
5-12	15°33'.03 N	084°38'.96'E	2209	6 Aug	3000	-	+	+	+	-	+	-	0110
5-13	14°47'.95 N	085°13'.20'E	0925	7 Aug	3000	-	+	+	+(12)	-	+	+	1236
6-14	16°27'.11 N	086°56'.86'E	0935	8 Aug	2560	-	+	+	+	-	+	-	0640
6-10	17°05'.07 N	086°21'.06'E	1242	8 Aug	2610	-	+	+	+	-	+	-	1536
6-9	17°05'.07 N	086°21'.06'E	1242	8 Aug	2610	-	+	+	+	-	+	-	0205
6-8	18°02'.35 N	085°26'.81'E	0525	9 Aug	2390	+	+	+	+(2)	-	-	-	0831
6-7	18°12'.96 N	085°17'.94'E	1010	9 Aug	2310	-	+	+	+	-	+	-	1251
6-6	18°20'.87 N	085°10'.83'E	1412	9 Aug	2210	-	+	+	-	-	-	-	1717
6-5	18°26'.88 N	085°0'.40'E	1957	9 Aug	1350	-	+	+	+	-	-	+	2205
6-4	18°50'.31 N	085°01'.10'E	2305	9 Aug	700	-	+	-	-	-	-	-	0005
6-3	18°36'.31 N	084°56'.92'E	0047	10 Aug	220	-	+	-	-	-	+	-	0212
6-2	18°40'.88 N	084°52'.06'E	0255	10 Aug	120	-	+	-	+	+	-	+	0403

6-1	18°50.04'H	084°43.74'E	0535	-10 Aug	47	-	+	-	-	+	-	-	0630
7-1	19°50.42'H	086°20.9'E	2025	10 Aug	50	-	+	-	-	+	+	-	2113
7-2	19°46.42'H	086°29.37'E	2208	10 Aug	90	-	+	-	+	+	-	-	2250
7-3	19°41.33'H	086°33.08'E	2353	10 Aug	660	-	+	-	-	+	+	-	0147
7-5	19°33.58'H	086°38.84'E	0259	11 Aug	1190	-	+	+	-	-	-	-	0520
7-6	19°26.82'H	086°43.92'E	0758	11 Aug	1500	-	+	+	+(2)	-	-	-	1001
7-7	19°14.34'H	086°51.42'E	1145	11 Aug	1700	-	+	+	-	-	+	+	1330
7-8	19°2.92'H	086°59.99'E	1520	11 Aug	1930	-	+	+	+	-	+	-	1745
7-9	18°41.01'H	087°15.98'E	2140	11 Aug	2200	+	+	+	+	-	+	-	0030
7-10	18°09.00'H	087°46.14'E	0658	12 Aug	2250	-	+	+	+	-	+	-	1016
7-11	17°15.95'H	088°16.05'E	1650	12 Aug	2400	-	+	+	+	-	+	-	2000
8-13	15°00.02'H	089°00.03'E	0250	13 Aug	2175	-	+	+	+	-	+	-	0542
8-12	18°56.15'H	088°44.19'E	1258	13 Aug	1822	-	+	+	+	-	+	-	1542
8-11	19°28.89'H	088°33.99'E	2040	13 Aug	1700	-	+	+	+	-	+	-	2257
8-10	19°44.00'H	088°29.98'E	0047	14 Aug	1500	-	+	+	+	-	-	-	0350
8-9	19°54.97'H	088°26.89'E	0450	14 Aug	1320	-	+	+	+	-	+	-	0648
8-8	20°02.03'H	088°24.92'E	0745	14 Aug	1180	-	+	+	-	-	-	-	0910
8-7	20°08.46'H	088°23.39'E	1000	14 Aug	1000	-	+	+	+	+	+	+	1226
8-6	20°13.68'H	088°21.89'E	700	14 Aug	700	-	+	-	-	+	-	-	1501
8-5	20°19.88'H	088°19.89'E	1550	14 Aug	175	+	+	-	+	+	+	-	1717
8-4	20°27.55'H	088°18'.06'E	1845	14 Aug	125	+	+	-	-	-	+	-	2205
8-3	20°37.00'H	088°14'.00'E	2118	14 Aug	108	-	+	-	+	+	+	-	2216
8-2	20°49.02'H	088°12'.17'E	2341	14 Aug	70	-	+	-	-	-	+	-	0005
8-1	20°58.40'H	088°08'.72'E	0115	15 Aug	11	-	+	-	-	+	+	-	0152

FOR NAVY/NOA