

ORV - SAGAR NIDHI

CRUISE REPORT

Cruise No. SN-132

(05th July – 06th August, 2018)



Submitted by

Mr. Suresh Kumar N

Chief Scientist, SN-132

Indian National Centre for Ocean Information Services

Hyderabad – 500 090

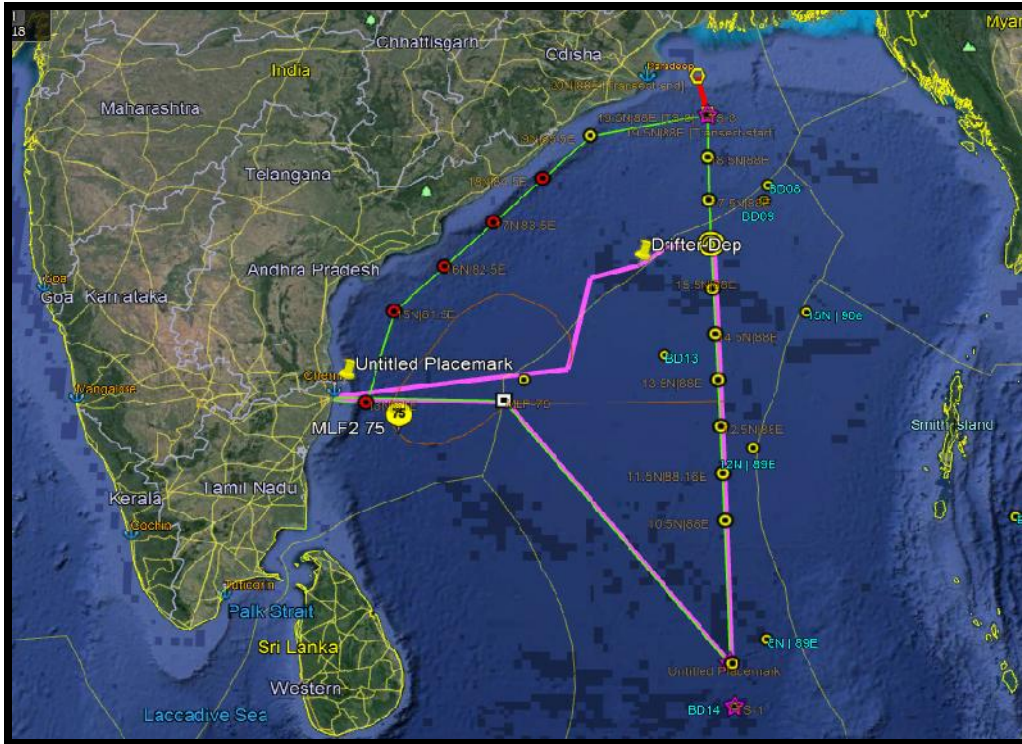
Objectives:

This cruise is dedicated to understand the near surface hydrographic, near surface meteorological, near surface turbulence and ocean biogeochemical measurements in the Bay of Bengal through underway CTD (uCTD), ADCP, Lagrangian float, Vertical Microstructure profiler (VMP), ASIMET system, Radiometer, Radiosonde, TSG, AWS and Seaglider during peak phase of summer monsoon. The proposed track and waypoint are attached as Annexure-I.

Primary objective is to provide a detailed description of the vertical distribution of small-scale turbulent characteristics in diurnal time scale in the northern Bay of Bengal during monsoon. The variation of the vertical distribution of small-scale turbulent characteristics with respect to variable background stratification and different forcing regime. Moreover, we planning to verify the performance of frequently used parameterization (e.g., KPP) using VMP measurements.

Diurnal variability of vertical distribution of small scale turbulence budget during different season, diffusion coefficient (K_T and K_S) and diffusive flux estimated from the residual of mixed layer heat and salt budgets will be validated with VMP

Planned & Actual Cruise Track:

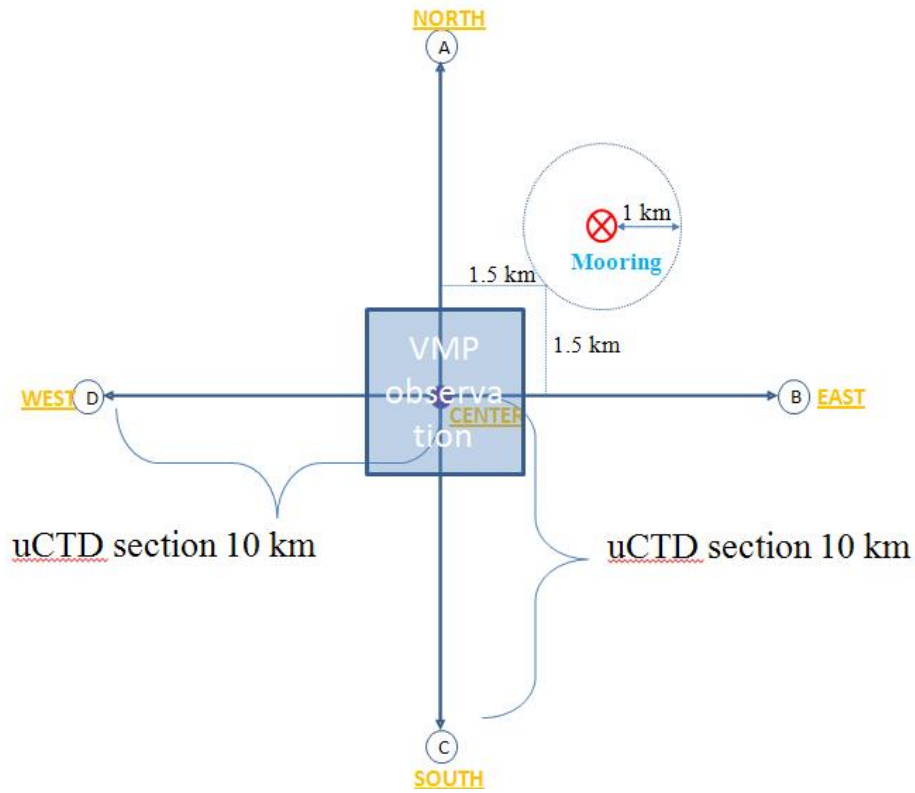


*** Green Line are Planned track, The Magenta line are the actual track, due to back to back low pressure systems in northern bay and worsening sea state, we bounded off the northern sections.

Planned Cruise Way points :

Activity	Latitude		Longitude		
	Deg.	Minutes	Deg.	Minutes	
Chennai, India	13	06.00	N 80	18.00	E
8N 88.8E [TS-1]	8	00.00	N 88	57.86	E
9N 88.8E	9	00.00	N 88	54.96	E
10N 88.8E	10	00.00	N 88	52.41	E
11N 88.8E	11	00.00	N 88	49.59	E
12N 88.7E [TS-2]	12	02.00	N 88	46.58	E
14N 88.4E	14	00.00	N 88	26.41	E
15N 88.1E	15	21.00	N 88	12.33	E
16.5N 88E [TS-3]	16	28.10	N 88	00.00	E
18N 88E	18	00.00	N 88	00.00	E
20N 88E [TS-4]	20	00.00	N 88	00.00	E
19N 85.5E [TS-5]	19	00.00	N 85	30.00	E
18N 84.5E	18	00.00	N 84	50.00	E
17N 83.5E	17	00.00	N 83	50.00	E
16N 82.5E	16	00.00	N 82	50.00	E
15N 81.5E	15	00.00	N 81	50.00	E
13N 81E	13	00.00	N 81	00.00	E
Chennai, India	13	06.00	N 80	18.00	E

Time-Series Plot @ VMP stations



- A. VMP measurements in every three hour interval (local time).
- B. (2.30:3.30a.m.)- INCOISCTD/LADCP- (5.30:6.30) - PRLCTD- (8.30:9.30) – EAST -(11.30:12.30 p.m.) – WEST -(2.30:3.30) - INCOISCTD/LADCP - (5.30:6.30) – North -(8.30:9.30) – South (11.30:12.30 a.m.) - INCOISCTD/LADCP - (2.30:3.30a.m.)
- VMP: 4-5 cast (400 m)

Scientific Participants SN-132 (from INCOIS)

Sr. No.	Name of Participants	Designation	Institute	Nationality
1	NEELAKANDAN SURESH KUMAR	CHIEF SCIENTIST	INCOIS	Indian
2	SHIVAPRAKASH SHIVAPRASAD	SCIENTIST	INCOIS	Indian
3	VARADAN PONNURANGAM THANGAPRAKASH	SCIENTIST	INCOIS	Indian
4	BODDEPALLI MURALI	SCIENTIST	INCOIS	Indian
5	KOTHANDARAMAN DINESH	ASSISTANT	INCOIS	Indian
6	ASHOK KUMAR	ASSISTANT	INCOIS	Indian
7	PRAMANIK SAIKAT	Research Fellow	IIT-Bhuv	Indian
8	SUKLA PRIYABRATA	Research Fellow	IIT-Bhuv	Indian
9	ABHISHEK PASULA	Research Fellow	IIT-Bhuv	Indian
10	RAMALINGAM RAJAPART	SEAMAN	INCOIS	Indian
11	RAJI UDHAYAKUMAR	SEAMAN	INCOIS	Indian
12	NIRAIMATHI NIVAS	SEAMAN	INCOIS	Indian
13	SANKAR THIVAKAR	SEAMAN	INCOIS	Indian

SN-132, Cruise Diary Events

Date		Operation Name	Start Time	End Time	LAT	LON	Remarks
Day-1	05-07-18	Science Team Joined the Ship after completing the SIGN ON formalities		12:00			
		VMP fabrication – fixing of Davit frames and winch base fixing were completed		18:00			
Day-2	06-07-18	Performed Pre-Cruise actions and continues the due jobs.					
		Science team advised wheel house that, all the deck activities and actions got over.		12:00			
Day-3	07-07-18	In late evening PM hours the Ship Sagar Nidhi departed from chennai port.					
		The SN-132 voyage is successfully began		20:00			
Day-4	08-07-18	Vessel propelled towards first waypoint of VMP operations.					
		ASIMET System configured to operational and recording data	12:14				Asimet System started out for measurements
Day-4	08-07-18	First VMP cast taken (~250m)	07:20	08:30	13° 03.37'N	83° 46.35'E	6 profiles has been taken
		Nitrate CTD + RBR 100m cast taken	10:00	10:20	13° 03.37'N	83° 46.35'E	used ship winch (hydrographic)
		Lagrangian Float (MLF-75) deployment	14:51		13° 03.17'N	83° 48.07'E	MLF is deployed using the ship 10Ton folded hydraulic winch
Day-5	09-07-18	Vessel Propelled, no operational activity					Sea state not favoring to scientific operation
Day-6	10-07-18	Aerosol and Atmospheric values system (NIO-Vizaq) is set up as per guidance from NIO	14:30				Due to bad weather Sea state and ambient conditions the 9.5 N operation has been aborted and planned to do time series operation @ 7.5N and carry out the PRL CTD(2000M) and VMP operation.
Day-7	11-07-18	Aerosol and Atmospheric values system (NIO-Vizaq)	14:30		09°54'N	88° 14.1 E	noted that NIO-Air sampler instrument has not functioning well as per requirement and decided to suspend the sampling, also concerning with weather (strong wind blow) it's too hard work with sampler unit.
		Data Downloaded - exchanged the filter paper					
Day-8	12-07-18	Small Boat preparation done	09:00		8°24.23'N	88° 17.14 E	
		RadioSonde Operation and preparatory actions were carried out	09:00				
		Met Parameters	10:00				
		RadioSonde balloon launched	17:00	17:30	7.832120N	88.25244E	
		Ship CTD w/t bottle samples 2000m	20:40	22:45	7°30'53"N	88° 14.42 E	
		Ship CTD w/t bottle samples 300m	22:50	23:30	7°30'53"N	88° 14.42 E	
Day-9	13-07-18	Ship CTD w/t bottle samples 100m	23:40	00:15	7°30'53"N	88° 14.42 E	
		RadioSonde balloon launched	05:00	06:00	7.49968N	88.24983E	
		VMP cast taken (~50,~250m)	05:30	07:00	7°30'061"N	88° 14.893 E	6 profiles has been taken
		VMP cast taken (~250m)	08:30	10:00	7°30'157"N	88° 14.844 E	5 profiles has been taken
		UCTD operation carried out.	14:10	14:25	East to center		
		VMP cast taken (~50,~250m)	11:42	12:50	7°30'068"N	88° 14.983 E	
		VMP cast taken (~250m)	15:00	16:35	7°30'241"N	88° 14.56 E	5 profiles has been taken
		RadioSonde balloon launched	17:30	17:45	7.49917N	88.25685E	
		VMP cast taken (~250m)	17:30	18:30	7°30'047"N	88° 14.685 E	5 profiles has been taken
		NIOT Nitrate CTD cast taken	18:45	20:15	7°30'7"N	88° 15.35 E	500m
		VMP cast taken (~250m)	20:30	21:30	7°30'107"N	88° 15.082 E	6 profiles has been taken
		VMP cast taken (~250m)	23:30	00:30	7°29'898"N	88° 14.749 E	6 profiles has been taken
Day-10	14-07-18	VMP cast taken (~50,~250m)	02:22	03:20	7°30'085"N	88° 14.375 E	6 profiles has been taken
		RadioSonde balloon launched	05:00	06:00	7.500012	88.23456E	Balloon burst in first launch and re launched immediately
		VMP cast taken (~50,~250m)	05:16	06:20	7°30'144"N	88° 15.647 E	6 profiles has been taken
		Ship CTD 500m	08:00	08:20	7°30'07"N	88° 14.7326 E	
		Nitrate CTD 100m	08:30	08:40	7°30'017"N	88° 14.7326 E	
		VMP cast taken (~50,~250m)	09:05	10:30			6 profiles has been taken
		Met Parameters	10:00				
		VMP cast taken (~50,~250m)	11:57	13:05	7°29'898"N	88° 15.134 E	6 profiles has been taken
		VMP cast taken (~50,~250m)	15:10	16:05	7°30'017"N	88° 12.955E	6 profiles has been taken
		RadioSonde balloon launched	17:30	18:00	7.499N	88.226E	
		VMP cast taken (~250m)	17:30	18:40	7°29'972"N	88° 13.463E	6 profiles has been taken
		Ship CTD 500m	20:10	20:20	7°30'N	88° 14.23 E	
		Nitrate CTD 100m	20:20	20:30	7°30'N	88° 14.23 E	
		VMP cast taken (~50,~250m)	20:24	21:24	7°29'941"N	88° 14.776 E	6 profiles has been taken
		VMP cast taken (~50,~250m)	23:40	00:50	7°29'815"N	88° 14.983 E	6 profiles has been taken
		VMP cast taken (~50,~250m)	02:30	03:40	7°29'595"N	88° 16.622 E	6 profiles has been taken
		RadioSonde balloon launched	05:00	05:30			
		VMP cast taken (~50,~250m)	05:44	06:45	7°29'941"N	88° 13.019E	6 profiles has been taken
		Ship CTD 500m	07:00	08:10	7°30'N	88° 14.7326 E	

SN-132, Cruise Diary Events

Date		Operation Name	Start Time	End Time	LAT	LON	Remarks
Day-11	15-07-18	Nitrate CTD + RBR 100m	08:20	08:40	7°30'N	88° 14.7326 E	
		VMP cast taken (~50,~250m)	08:40	09:45	7°29'994"N	88° 14.708 E	6 profiles has been taken
		UCTD cast taken	11:00	05:00			28 profiles
		RadioSonde balloon launched	17:30	18:00			
		Ship CTD 500m	17:00	18:20	8°2.683N	88° 13.76E	
		Nitrate CTD + RBR 100m	18:20	18:45	8°2.683N	88° 13.76E	
		VMP cast taken (~50,~250m)	18:45	19:50	8°1.882N	88° 16.204 E	6 profiles has been taken
		UCTD cast taken	21:12	05:00			41 profiles
Day-12	16-07-18	RadioSonde balloon launched	05:10	05:30	8° 46.536N	88° 13.660	
		Ship CTD bottle samples 2000m	05:55	07:10	8°47.66"N	88° 13.44E	
		Ship CTD bottle samples 300m	07:15	08:00	8°47.66"N	88° 13.44E	
		Ship CTD bottle samples 100m	08:15	08:45	8°47.66"N	88° 13.44E	
		Nitrate CTD + RBR 100m	09:00	09:15	8°47.66"N	88° 13.44E	
		VMP cast taken (~50,~250m)	09:26	10:40	8°47.690"N	88° 16.820 E	6 profiles has been taken
		Met Parameters collected by IIT-Bhuv	10:30				
		UCTD cast taken	11:00	16:30			34 profiles
		RadioSonde balloon launched	17:30	18:00	9.32396N	88.2155 E	Raining during launch
		Ship CTD	17:55	18:40	9°25.813"N	88° 11.15E	
		VMP cast taken (~50,~250m)	18:50	20:01	9°25.871"N	88° 11.216E	6 profiles has been taken
				UCTD cast taken	21:00	04:30	
Day-13	17-07-18	RadioSonde balloon launched	05:30	05:45	10°25.63N	88°09.105E	
		Ship CTD 500m	05:55	06:40	10°25.474N	88°09.094E	
		Nitrate CTD + RBR 100m	06:40	07:00	10°25.474N	88°09.094E	
		VMP cast taken (~50,~250m)	07:10	08:10	10°25.63N	88°09.186E	6 profiles has been taken
		UCTD cast taken	14:00	16:30			12 profiles. Winch wire got entangled during early hours of 17/07/18. old wire has been removed and new wire has been attached to the winch.
		RadioSonde balloon launched	17:30	17:45	11°27.224N	88°08.985E	
		Ship CTD 500m	17:55	18:45	11° 29.039N	88° 8.845E	
		Nitrate CTD + RBR 100m	18:50	19:05	11° 29.039N	88° 8.845E	
		VMP cast taken (~50,~250m)	19:15	20:35	11° 29.182"N	88° 9.02"E	
				UCTD cast taken	21:00	05:00	
Day-14	18-07-18	RadioSonde balloon launched	05:00	05:30	12°27.472"N	88°06.478E	
		Ship CTD bottle samples 2000m	05:58	07:25	12° 29.602N	88° 6.521E	
		Ship CTD bottle samples 300m	07:30	08:00	12°29.59N	88° 06.521E	
		Ship CTD bottle samples 100m	08:10	09:00	12°29.59N	88°06.520E	
		VMP cast taken (~50,~250m)	09:20	10:30	12° 29.617"N	88° 6.553"E	
		UCTD cast taken	10:40	16:30			38 profiles
		RadioSonde balloon launched	17:00	17:30	13°11.058"N	88°05.07"E	
		Ship CTD 500m	17:56	18:30	13° 13.224"N	88° 04.979"E	
		Nitrate CTD + RBR 100m	18:35	18:50	13° 13.224"N	88° 04.979"E	
		VMP cast taken (~50,~250m)	19:00	18:35	13° 13.32"N	88° 5.155"E	
		UCTD cast taken	21:00	04:30			37 profiles
Day-15	19-07-18	RadioSonde balloon launched	05:00	05:30	14°13.639"N	88°03.635"E	
		Ship CTD bottle samples 2000m	05:58	07:00	14° 13.638"N	88° 03.365"E	
		Ship CTD bottle samples 300m	07:00	07:38	14° 13.638"N	88° 03.365"E	
		Ship CTD bottle samples 100m	07:40	08:00	14° 13.638"N	88° 03.365"E	
		RBR 100m	08:55	09:10	14° 13.638"N	88° 03.365"E	
		VMP cast taken (~50,~250m)	09:15	10:30	14° 53.874"N	88° 02.853"E	
		UCTD cast taken	11:00	16:30			30 profiles
		RadioSonde balloon launched	17:00	17:30	14°20.944;N	88°06.306"E	
		Ship CTD 500m	18:00	18:30	14° 53.894"N	88° 02.717"E	
		Nitrate CTD + RBR 100m	18:35	18:45	14° 53.894"N	88° 02.717"E	
		UCTD cast taken	21:00	04:00			
Day-16	20-07-18	Due to bad weather all operations are suspended					
		RadioSonde balloon launched	05:00	05:30	15°38.923"N	88°00.7718"E	
		RadioSonde balloon launched	17:00	17:30	16°09.020"N	88°25.466"E	
Day-17	21-07-18	RadioSonde balloon launched	05:00	05:30	16°07.048"N	88°12.88"E	
		Due to bad weather all operations are suspended					
Time Series @ TS-2 (16.5N 88E) has started							
Day-18	22-07-18	RadioSonde balloon launched	05:00	05:30	16°35.77"N	88°35.35"E	
		RadioSonde balloon launched	17:00	17:30	16°29.46"N	87°59.988"E	
		Seaglider testing	17:30				Seaglider testing.
		VMP cast taken (~50,~250m)	17:36	18:45	16°29.470N	88°00.021E	6 profiles has been taken
		Ship CTD 1000m	19:35	20:40	16°29.958N	88°03.167E	
		VMP cast taken (~50,~250m)	21:50	22:57	16°31.082N	88°00.690E	6 profiles has been taken
		VMP cast taken (~50,~250m)	23:51	00:51	16°31.372N	88°0.968E	6 profiles has been taken
		VMP cast taken (~50,~250m)	02:24	04:00	16°31.529N	88°01.004E	6 profiles has been taken
		RadioSonde balloon launched	05:00	05:30	16°30.560"N	87°58.997E	
		VMP cast taken (~50,~250m)	05:12	06:05	16°30.025N	88°0.403E	
		RBR 200M using VMP WINCH	06:05	06:15			
		Ship CTD 1000m	06:15	07:11	16°30.883N	88°0.648E	

SN-132, Cruise Diary Events

Date		Operation Name	Start Time	End Time	LAT	LON	Remarks		
Day-19	23-07-18	VMP cast taken (~50,~250m)	08:37	09:45	16°31.242N	87°59.666E	6 profiles has been taken		
		Seaglider testing	09:00				Seaglider testing.		
		VMP cast taken (~50,~250m)	11:00	12:15	16°31.415N	88°0.092E	6 profiles has been taken		
		VMP cast taken (~50,~250m)	14:08	15:30	16°30.103N	88°01.370E	6 profiles has been taken		
		VMP cast taken (~50,~250m)	16:44	18:00	16°30.093N	87°58.954E	6 profiles has been taken		
		RadioSonde balloon launched	17:00	17:30	16°30.194N	87°59.536E			
		RBR 200M using VMP WINCH	18:15	18:30	16°30.382N	88°00.534E			
		Ship CTD 1000m	19:06	19:30	16°30.530N	88°0.421E			
Day-20	24-07-18	VMP cast taken (~50,~250m)	02:13	03:31	16°30.3533N	87°59.8901E	6 profiles has been taken		
		VMP cast taken (~50,~250m)	04:38	05:45	16°30.584N	87.58.793E	6 profiles has been taken		
		RadioSonde balloon launched	05:00	05:30	16°30.701N	87°59.576E			
		RBR 200M using VMP WINCH	05:45	05:55	16°30.983N	88°1.049E			
		Ship CTD bottle samples 2000m	06:00	07:51	16°30.486N	88°00.421E			
		Ship CTD bottle samples 300m	07:57	08:30	16°30.486N	88°00.421E			
		Ship CTD bottle samples 100m	08:30	08:50	16°30.486N	88°00.421E			
		VMP cast taken (~50,~250m)	10:22	11:30	16°30.474N	87°59.185E	6 profiles has been taken		
		VMP cast taken (~50,~250m)	11:30	12:30	16°30.840N	88°0.613E	6 profiles has been taken		
		VMP cast taken (~50,~250m)	02:10	03:40	16°30.184N	88°59.053E	6 profiles has been taken		
		VMP cast taken (~50,~250m)	04:50	18:15	16°30.047N	87°59.065E	6 profiles has been taken		
		RadioSonde balloon launched	17:00	17:30	16°30.35N	88°00.08E			
		RBR 200M using VMP WINCH	18:15	18:25	16°30.579E	88°00.795E			
		Ship CTD 1000m	19:00	19:40	16°30.493N	88°00.43E			
		VMP cast taken (~50,~250m)	20:30	21:50	16°30.558N	87°59.132E	6 profiles has been taken		
		VMP cast taken (~50,~250m)	23:05	00:25	16°30.067N	87°58.883E	6 profiles has been taken		
Day-21	25-07-18	VMP cast taken (~50,~250m)	02:08	03:28	16°30.163N	87°59.051E	6 profiles has been taken		
		VMP cast taken (~50,~250m)	04:40	05:45	16°29.964N	87°59.030E	6 profiles has been taken		
		RadioSonde balloon launched	05:00	05:30	16°30.469N	88°00.152E			
		RBR 200M using VMP WINCH	05:45	05:55	16°30.089N	88°00.772E			
		Ship CTD 1000m	06:59	08:00	16°30.49N	88°00.433E			
		VMP cast taken (~50,~250m)	08:36	10:15	16°30.2N	87°59.976E	6 profiles has been taken		
		VMP cast taken (~50,~250m)	11:16	12:38	16°30.035N	87°59.168E	6 profiles has been taken		
		VMP cast taken (~50,~250m)	14:00	15:31	16°30.055N	87°59.237E	6 profiles has been taken		
		VMP cast taken (~50,~250m)	16:39	17:50	16°29.962N	87°59.107E	6 profiles has been taken		
		RadioSonde balloon launched	17:00	17:30	16°30.130N	88°00.372E			
		RBR 200M using VMP WINCH	17:50	18:05	16°30.189N	88°00.896E			
		Ship CTD 1000m	18:45	19:40	16°30.45N	88°00.460E			
		VMP cast taken (~50,~250m)	20:10	21:30	16°29.962N	87°58.904E	6 profiles has been taken		
		VMP cast taken (~50,~250m)	22:52	00:10	16°30.175N	88°0.127E	6 profiles has been taken		
		Day-22	26-07-18	VMP cast taken (~50,~250m)	02:16	03:30	16°30.45N	87°58.937E	6 profiles has been taken
				VMP cast taken (~50,~250m)	04:42	06:00	16°29.982N	87°58.931E	6 profiles has been taken
RadioSonde balloon launched	05:00			05:30	16°30.127N	87°59.38E			
RBR 200M using VMP WINCH	06:05			06:15	16°30.425N	88°00.46E			
Ship CTD 1000m	06:40			07:40	16°30.49N	88°00.41E			
VMP cast taken (~50,~250m)	08:34			09:52	16°29.996N	87°59.29E	6 profiles has been taken		
VMP cast taken (~50,~250m)	10:49			12:00	16°30.377N	87°59.012E	6 profiles has been taken		
VMP cast taken (~50,~250m)	14:14			15:30	16°30.306N	87°59.229E	6 profiles has been taken		
VMP cast taken (~50,~250m)	16:43			18:00	16°30.466N	87°59.049E	6 profiles has been taken		
RadioSonde balloon launched	17:00			17:30	16°30.452N	87°58.99E			
Seaglider Testing	17:30						Seaglider testing and configuration performed		
RBR 200M using VMP WINCH	18:00			18:10	16°30.731N	88°01.088E			
Ship CTD 1000m	18:49			20:00	16°30.58N	88°00.94E			
VMP cast taken (~50,~250m)	20:22			21:35	16°30.457N	87°58.896E	6 profiles has been taken		
VMP cast taken (~50,~250m)	22:57			01:00	16°30.0601N	87°59.179E	9 profiles has been taken		
Day-23	27-07-18			VMP cast taken (~50,~250m)	02:16	03:30	16°30.313N	87°58.989E	6 profiles has been taken
		VMP cast taken (~50,~250m)	04:44	06:00	16°30.110N	87°58.934E	6 profiles has been taken		
		RadioSonde balloon launched	05:00	05:30	16 30.052N	88 00.372E			
		RBR 200M using VMP WINCH	06:00	06:15	16°30.752N	88°01.071E			
		Ship CTD 1000m	05:43	07:00	16°30.701N	8800.824E			
		Seaglider Testing	07:10				Seaglider testing and configuration performed		
		VMP cast taken (~50,~250m)	08:30	09:50	16°30.036N	87°59.114E	6 profiles has been taken		
		VMP cast taken (~50,~250m)	10:55	12:15	16°30.419N	87°58.818E	6 profiles has been taken		
		VMP cast taken (~50,~250m)	14:00	15:15	16°30.439N	87°58.756E	6 profiles has been taken		
		VMP cast taken (~50,~250m)	16:45	17:55	16°30.331N	87°59.142E	6 profiles has been taken		
Day-24	28-07-18	RadioSonde balloon launched	17:00	17:30	16 30.60N	88 00.38E			
		RBR 200M using VMP WINCH	18:00	18:15	16°30.025N	87°59.882E			
		INCOIS CTD 200m taken	07:00	07:30	16°30.49N	88°00.419E			
		ROWE ADCP 50m	11:05	12:15			Data can't be downloaded, due technical issue with instrument		
		Seaglider deployment aborted				Due to bad weather state Seaglider deployment is postponed to 29/07/18			
		Ship CTD bottle samples 2000m	06:01	08:31	16°28.176N	87°05.001E			

SN-132, Cruise Diary Events

Date		Operation Name	Start Time	End Time	LAT	LON	Remarks
Day-25	29-07-18	Ship CTD bottle samples 300m	08:31	09:00	16°28.18'N	87°05.02'E	
		Ship CTD bottle samples 100m	09:00	09:15	16°28.18'N	87°05.02'E	
		SeaGlider SG627 Deployment	11:00	11:50	16°28.176'N	87°05.001'E	Seaglider successfully deployed by ship 10 Ton hydraulic crane, from port stern side.
Day-26	30-07-18	VMP cast taken (~50,~250m)	14:15	15:30	16°28.171'N	87°02.143'E	
		BD16-Surface Drifter buoy deployed	15:47		16 00.97'N	86 31.71'E	
Day-27	31-07-18	Ship CTD bottle samples 2000m	06:05	08:00	15°42.30'N	85°28.94'E	
		Ship CTD bottle samples 300m	08:05	09:15	15°42.30'N	85°28.94'E	
		Ship CTD bottle samples 100m	09:20	09:40	15°42.30'N	85°28.94'E	
		VMP cast taken (~50,~250m)	09:18	10:38	15°42.317'N	85°29.017'E	
Day-28	01-08-18	Recovery of MLF operation were postponed due to bad sea state as advised by Master					
Day-29	02-08-18	Recovery of MLF operation were postponed due to bad sea state as advised by Master					
Day-30	03-08-18	Recovery of MLF operation were postponed due to bad sea state as advised by Master					
Day-31	04-08-18	Lagrangian Float (MLF-75) Recovered Successfully	13:00	15:30	13° 32.22'N	85° 03.46'E	Lagrangian Float Recovered using the small boat by chief scientist and two seaman.
		BD19-Surface Drifter buoy deployed	17:30	18:00	13° 13.48'N	84° 40.44'E	
Day-32	05-08-18	VMP sensors are disassembled and packed up					
		Lagrangian Float (MLF-75) packed up					
Day-33	06-08-18	Asimet is stopped recording and packed up	11:00				
		Vessel arrived Chennai Port and berthed	12:00	12:00			
		Science (INCOIS & PRL) Team successfully signed off	16:00	18:30			

Acknowledgements

I on behalf of the Science team of SN-132, would like to thank **Master**, Chief Officer, Chief Engineer and all Officers, Doctor, Electrical Engineers and Crew members onboard ORV-Sagar Nidhi, for their excellent cooperation and good team work throughout the cruise in making this voyage a very successful

I wish to thank Mr. **D Rajasekhar** & Mr. **N Ravi** NIOT, for all the administrative and logistic supports during the cruise. I sincerely thank agents M/s. ASPL & M/s. SCI and their team for make out all the paper works in-time during our Sign-On and Sign-Off process.

Thanks to **VMC representative / ship board engineers** for their untiring works during our data measurements and CTD operations. Finally I would like to thank all the members of scientific team of SN-132 to make this a completely successful and enjoyable cruise.



N Suresh Kumar
Chief Scientist (SN-132)