

RV - SAGAR MANJUSHA

CRUISE REPORT

Cruise No. SAMA-01/16

(06-Jan-2016 to 13-Jan-2016)



Submitted by

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Objectives:

This cruise is principally dedicated to the recovery of deep ocean Sea Glider at 18N|90E site and deployment of two Argo Floats along with ship enroot.

Seaglider is an autonomous underwater vehicle (AUV) or underwater glider developed for continuous, long term measurement of oceanographic parameters. Rather than an electrically driven propeller, the vehicle uses small changes in buoyancy and wings to achieve forward motion. The system's pitch and roll are controlled using adjustable ballast (the vehicle battery). The vehicle moves through the water in a saw-tooth like pattern and surfaces often to determine its position. Navigation is accomplished using a combination of GPS fixes while on the surface and internal sensors that monitor the vehicle heading, depth and attitude during dives. External sensors are constantly scanning the ocean to determine environmental properties.

The Deep Sea Glider (SG-615) is equipped with a Seabird-CT sensor, Wetlab-Backscatter/Fluorometer, Aanderaa -dissolved oxygen and Photosynthetically Active Radiation (PAR) sensors, and it had been successfully deployed in water during the Ocean Monsoon Mission(OMM) cruise onboard RV-Sagar Nidhi (SN-100) on 3rd Sep, 2015 at 17.5°N | 89.8°E

The glider was piloted to the WHOI mooring location 18°N | 89.5°E, and settled into a butterfly (or bowtie) pattern around the mooring (Figure-1), diving to 1000 m and reporting data several times a day. The spatial scale of the survey was chosen to be around 30 km, and the nominal spatial resolution (i.e. distance between successive profiles) is about 3 km. Followed by the deployment after mid November, 2015 the glider was not able to properly communicate to ground stations due to technical malfunction (suspected) We lost contact with the glider for fewer days, apparently the glider was unable to surface and report location. On later surfacing, the glider transmitted the location as well as stored profiles. the Seaglider has returned a total of ~530 profiles(Figure-1). Since the glider is planned for 6 months observation and due to interrupted communication with critical consequences , it's been finally decided to recover the glider before the expiry of its life.



Figure - 1

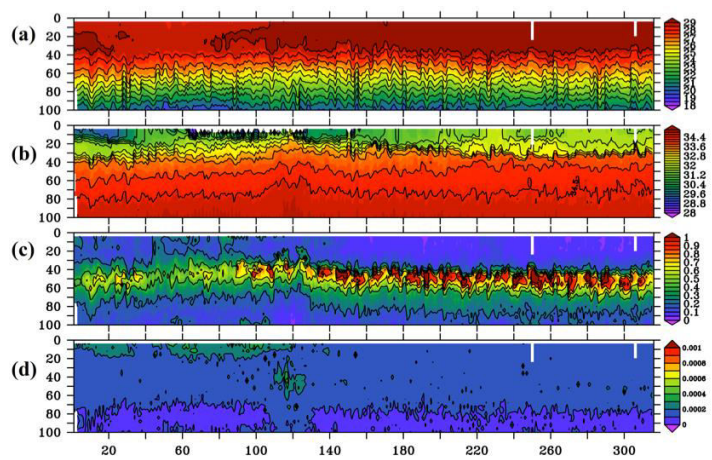
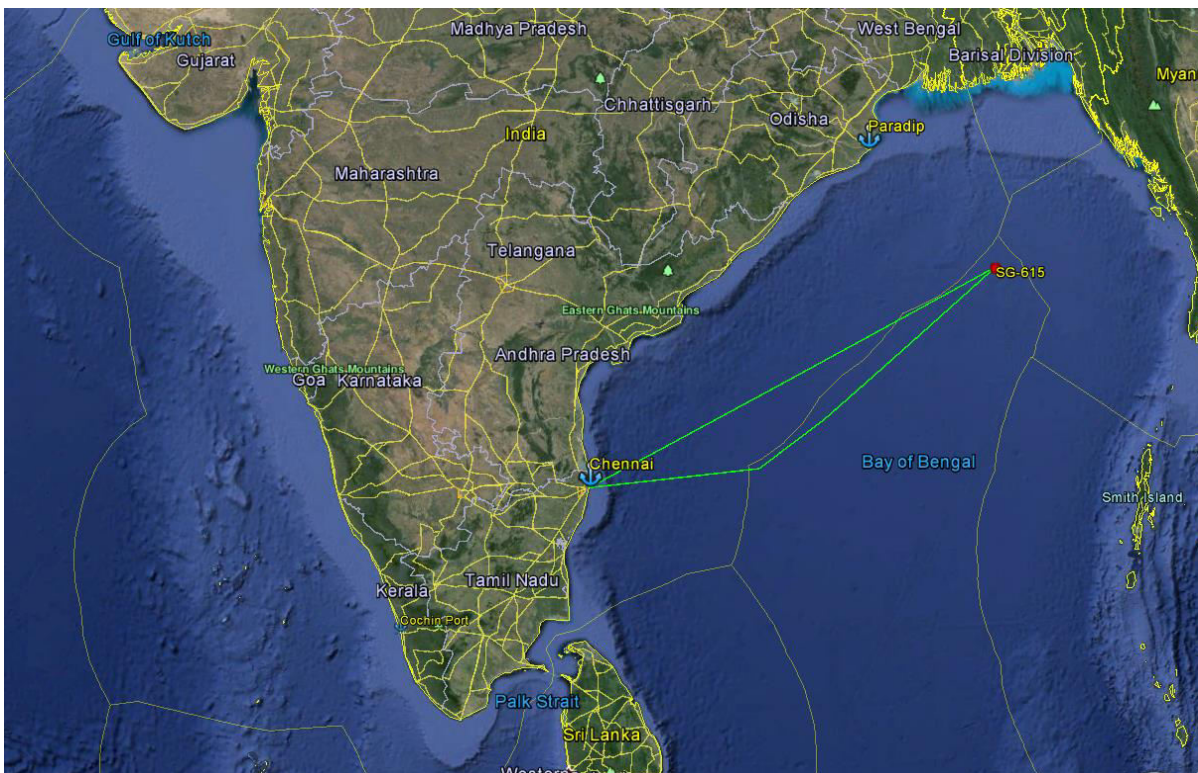


Figure - 2

Cruise Track:



Scientific Participants SK-315

Sr. No.	Name of Participants	Designation	Institute	Nationality
1.	Mr. NEELAKANDAN SURESH KUMAR	Chief Scientist	INCOIS	INDIA
2.	Mr. SELVARAJ VENKATESAN	Deployment Asst.	INCOIS	INDIA
3.	Mr. RAGHAVAN NARAYAN	Deployment Asst.	INCOIS	INDIA
4.	Mr. KIRUBAKKARAN	Deployment Asst.	INCOIS	INDIA

Recovery Details of Deep Sea Glider :

Sr. No	Hull ID	Make Name	Recovered		Recovered
			Latitude	Longitude	Date & Time (IST)
1	SG-615	Kongsberg	17°44.789 N	89°49.710 E	10-01-2016 & 11:30

Deployment of Argo Floats :

Sr. No	Float ID	Model Name	Deployed		Deployment
			Latitude	Longitude	Date & Time (UTC)
1	7555	APEX-APF9I	17°00.089 N	88°37.045 E	10-01-2016 & 19:17
2	7546	APEX-APF9I	14°30.105 N	85°26.815 E	11-01-2016 & 19:44

Diary of Events

06-Jan-2016, Day 1

- @ 18:00 hrs, Scientific team Signed ON at 18:00 Hrs and accommodation allotted to all of them after completion of Port formalities.

07-Jan-2016, Day 2

- @ 01:30 hrs, Equipments were offloaded from the trucks and loaded onboard.
- @ 11:00 hrs, Vessel departed from Chennai port.

08-Jan-2016, Day 3

- 08:00 Hrs, Vessel propelled to Glider site 17 40 N | 89 30 E.

09-Jan-2016, Day 4

- @ 09:00 Hrs, Ship Familiarisation conducted with scientific team and ship crew members.
- @ 10:30 Hrs, Pre-cruise meeting conducted for cruise operation and plan with Master, Officers, deck crew members, Scientist.
- @ 16:00 Hrs, Safety drill practised with onboard ship crews and scientist team.

10-Jan-2016, Day 5

- @ 03:30 hrs, Vsl arrived the glider earlier location and awaiting email from INCOIS-Ground station for the glider new updated position, as part of recovery operation the glider had been set for recovery mode i.e. the glider won't make any deep dive, it will be in surface and keep on transmit its location through satellite for every 1 hours.
- @ 04:30 hrs, we received email from INCOIS and advised the vsl. to proceed to new location.
- @06:00 hrs, another email received from INCOIS and searching plan initiated, all the corners in vessel we set up more lookouts and start searching the glider which is supposed to be in surface.

- The email communication from base station and the surfaced glider transit with ocean currents, we are very much hard to sight the glider in sea. Though the weather conditions are extremely favour to us, no swell and not much windy..only the local surface current are dominating us.
- Later we executed the ship drift sturdy and made many search plans, really it's quite challengeable to find the small size of glider antenna in big open ocean region.
- @ 10:45 hrs, after many more hours of search from morning. we finally sighted the glider location successfully, it is really good team effort and well coordination between scientist and ship staffs.
- @ 10:50 hrs, small boat lowered in water and performs the glider recovery operation.
- @ 11:36 hrs, by using the ship crane, the glider is picked up nicely and placed onboard successfully.
- At the end we completed our recovery operation of Deep Sea Glider (SG-615) and propelled to WHOI mooring location,
- @ 14:47 Hrs, Mooring sited in position of 17 59N|89 27E.
- @16:30 hrs all intended operation were completed and ship proceed to Chennai , in way we had Argo Floats deployments

11-Jan-2016, Day 6

- @ 00:47 hrs First Argo float (Id: 7555) deployed, in position of 17 00 N| 88 37 E.

12-Jan-2016, Day 7

- @ 01:15 hrs, Second Argo Float (7546) deployed in position of 14 30 N|85 26 E.
- As per request from NIOT we visited the BD-11 buoy mooring location,
- @ 11:39 hrs, NIOT Buoy was sighted in position of 13 28 N | 83 59 E, observed that there is no any physical damaged to mooring,

13- Jan-2016, Day8

- @ 08:00 hrs, Vessel arrived Chennai port after successfully completing the intend operations
- @ 13:15 hrs, Vsl berthed alongside in boar basin.
- @ 16:00 hrs, Scientific Team were signed OFF
- @ 18:00 hrs, All the port formalities were completed successfully.

Summary of the scientific works done during cruise SK-315:

1. 01 – Deep Sea Glider (SG-615) were successfully retrieved.
2. 2 No's - Apex Argo Floats were deployed along with Ship enroot.
3. Visited WHOI-Flux mooring and NIOT BD-11 Mooring for visual inspection.

Acknowledgements

I on behalf of the scientific team of this cruise SAMA-01/16, would like to thank Director, NIOT for providing the research vessel “RV Sagar Manjusha” and all the facilities onboard for our operations, i sincerely thank to Master v Sagar Manjusha, Chief Officer, Chief Engineer and all Officers, Electrical Engineers and Crew members onboard ORV- Sagar Manjusha, for their excellent cooperation and good team work throughout the cruise in making this voyage a very successful, I am also thankful to Dr. M. Girish and VP Thangaprakash, INCOIS for the excellent ground support and valuable information provided during the recovery operations.

I wish to thank Mr. D Rajasekhar & Mr. Mohan for all the cruise administrative and supports during the cruise.

Date: 13-Jan-2016

(N Suresh Kumar)
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