



R/V Yokosuka Cruise Report
YK19-14

Sea Trial of AUV “AUV-NEXT”

Oct. 22, 2019 -Nov. 1. 2019

Japan Agency for Marine-Earth Science and Technology
(JAMSTEC)

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1. Cruise Information

- Cruise ID: YK19-14
- Name of vessel: R/V Yokosuka
- Title of the cruise:
Sea trial of AUV “AUV-NEXT”
- Cruise period: October 22, 2019 - November 1, 2019
- Ports of departure / call / arrival: Yokosuka (JAMSTEC) - Yokosuka (JAMSTEC)
- Research area: Suruga Bay
- Research Map

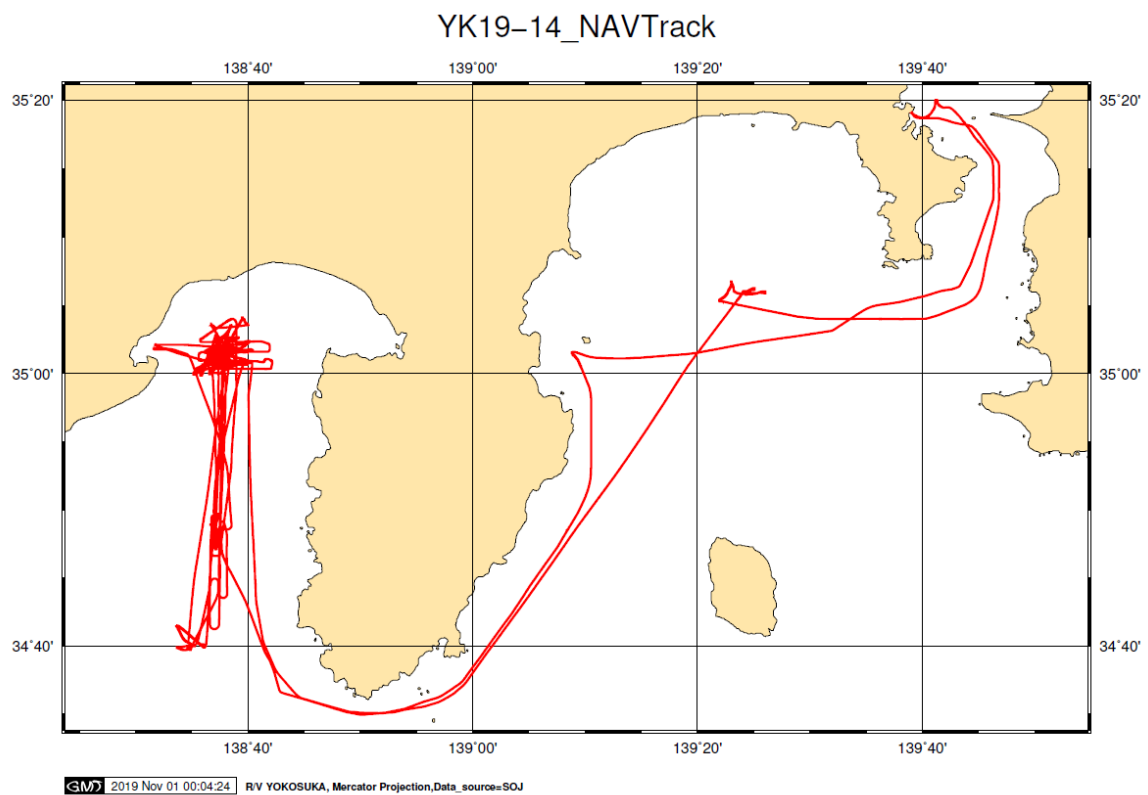


Fig1. Cruise track of YK19-14

2. Researchers

- Chief Scientist [Affiliation]: Takeshi Nakatani [JAMSTEC]
- Science party (List) [Affiliation, assignment etc.]
 - Tadahiro Hyakudome [JAMSTEC]
 - Hiroshi Ochi [JAMSTEC]
 - Shinobu Omika [JAMSTEC]
 - Tatsuya Aso [JAMSTEC]

Shigeo Matsuda [Clover tech Inc.]
Takafumi Omura [Clover tech Inc.]
Masanao Sumiyoshi [Japan Coast Guard]

3. 3. Sea Trial of AUV “AUV-NEXT”

- Purpose

JAMSTEC developed "AUV-NEXT" in 2018. This cruise was conducted to test the whole system of "AUV-NEXT". The main aim was to verify its acoustic communication, navigation control, and observation functions. Its acoustic communication device was replaced after YK18-E01.

- AUV “AUV-NEXT”

AUV “AUV-NEXT” was developed as a testbed in a project “Development of next-generation system for deep-sea exploration” in JAMSTEC. “AUV-NEXT” is a 4,000m class cruising AUV. The main purpose is seafloor sonar mapping of vast area with high speed. The vehicle has a capability to cruise at 3knot for 40hours.

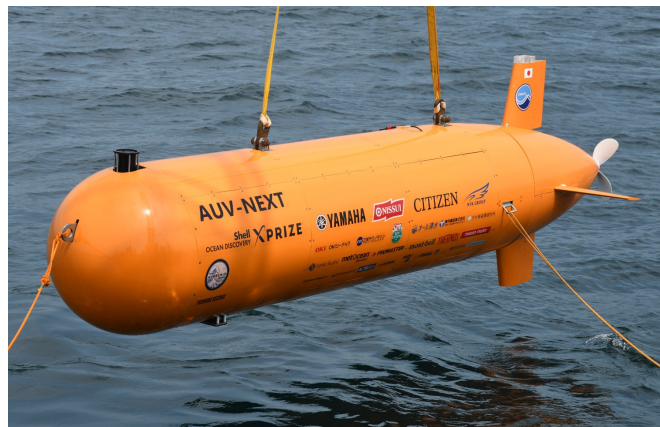


Fig.2 AUV “AUV-NEXT”

Table 1 Specifications of “AUV-NEXT”

Size[L×B×H](m)	5.6 x 1.8 x 1.7
Mass in Air(kg)	2,300
Depth Rating(m)	4,000
Velocity(kn)	4.5
Duration	40hrs@3knot
Power Supply	Li-ion

- Activities

Table 2 shows the activities of the cruise. In this cruise, we conducted five dives of “AUV-NEXT”.

Table 2 Schedule of YK19-14 cruise

Date	activities
Oct. 22	Departured from YOKOSUKA (JAMSTEC pier)
Oct. 23	Rough sea state
Oct. 24	Rough sea state
Oct. 25	Rough sea state
Oct. 26	"AUV-NEXT" Dive#6 (Suruga bay)
Oct. 27	"AUV-NEXT" Dive#7 (Suruga bay)
Oct. 28	"AUV-NEXT" Dive#8 (Suruga bay)
Oct. 29	"AUV-NEXT" Dive#9 (Suruga bay)
Oct. 30	Maintenance
Oct. 31	"AUV-NEXT" Dive#10 (Suruga bay)
Nov. 1	Arrived at YOKOSUKA (JAMSTEC pier)

- Results

We verified its navigation control and observation functions through the sea trial. The trajectory and vertical profile of Dive #8 are shown in Fig.3 and Fig.4, respectively. We tuned parameters and alignments of the instruments, especially INS and multibeam sonar, based on the observation data. The maximum operation depth was 1,592m during Dive#9.

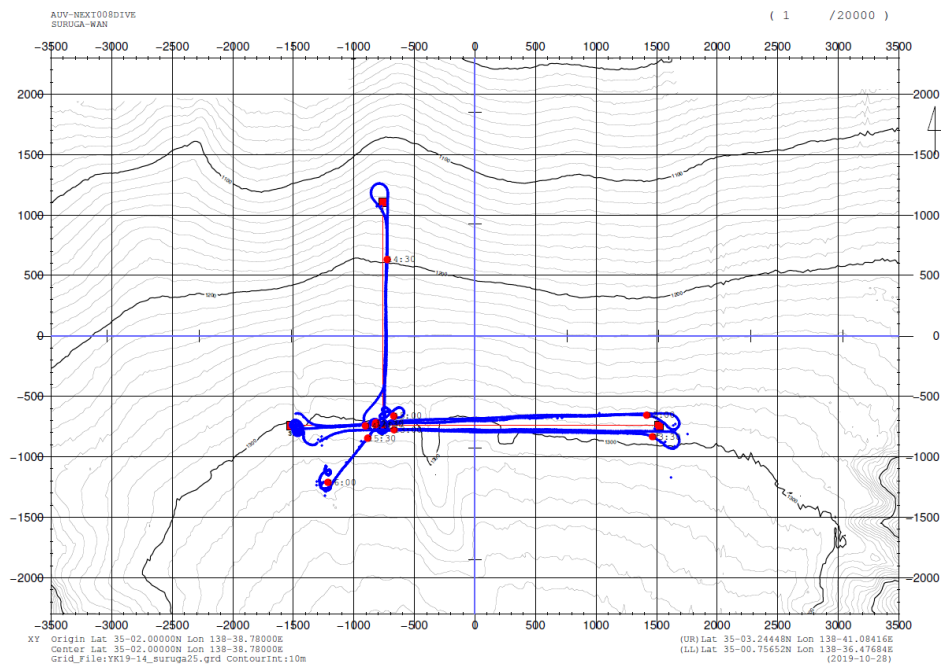


Fig.3 Trajectory of “AUV-NEXT” during Dive #8

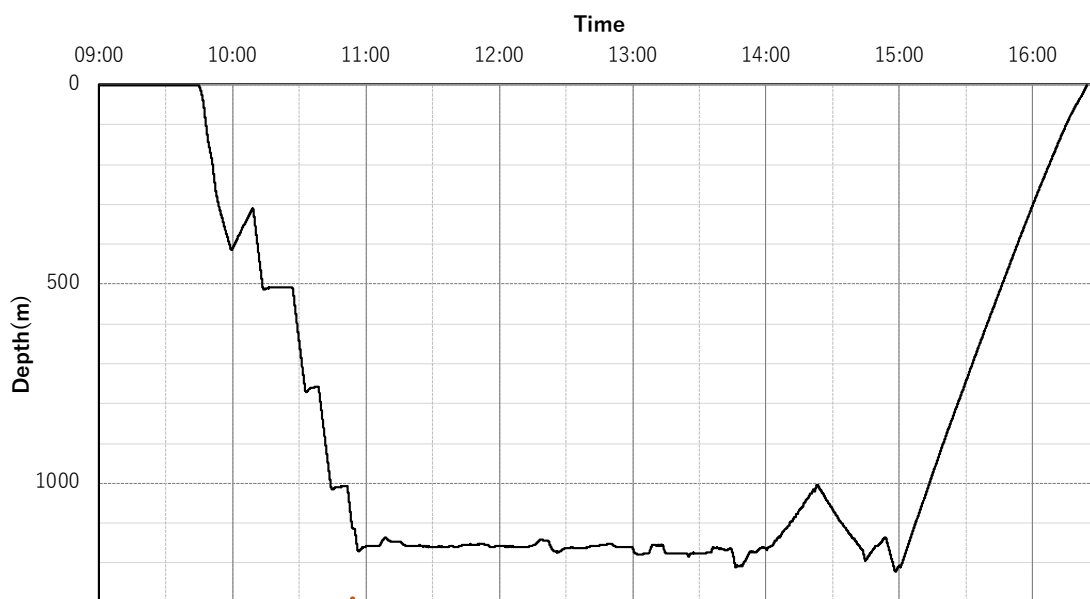


Fig.4 Vertical profile of "AUV-NEXT" during Dive #8

4. Notice on Using

This cruise report is a preliminary documentation as of the end of the cruise.

This report may not be corrected even if changes on contents (i.e. taxonomic classifications) may be found after its publication. This report may also be changed without notice. Data on this cruise report may be raw or unprocessed. If you are going to use or refer to the data written on this report, please ask the Chief Scientist for latest information.

Users of data or results on this cruise report are requested to submit their results to the Data Management Group of JAMSTEC.

Acknowledgement

We would like to thank the captain Takafumi Aoki and his crew of the R/V Yokosuka, and Akihisa Ishikawa and the AUV technical support team (Nippon Marine Enterprises, Ltd.) for AUV safe operation and great support during the cruise.