



R/V Yokosuka Cruise Report

YK20-03

Sea Trial of AUV “AUV-NEXT”

Mar. 18, 2020 - Mar. 28, 2020

Japan Agency for Marine-Earth Science and Technology

(JAMSTEC)

Contents

- 1. Cruise Information**
- 2. Researchers**
- 3. Sea Trial of AUV “AUV-NEXT”**

1. Cruise Information

- Cruise ID: YK20-03
- Name of vessel: R/V Yokosuka
- Title of the cruise:
Sea trial of AUV “AUV-NEXT”
- Cruise period: March 18, 2020 - March 28, 2020
- Ports of departure / call / arrival: Yokosuka (JAMSTEC) - Yokosuka (JAMSTEC)
- Research area: Sagami Bay, Suruga Bay, and Off Kii Peninsula
- Research Map

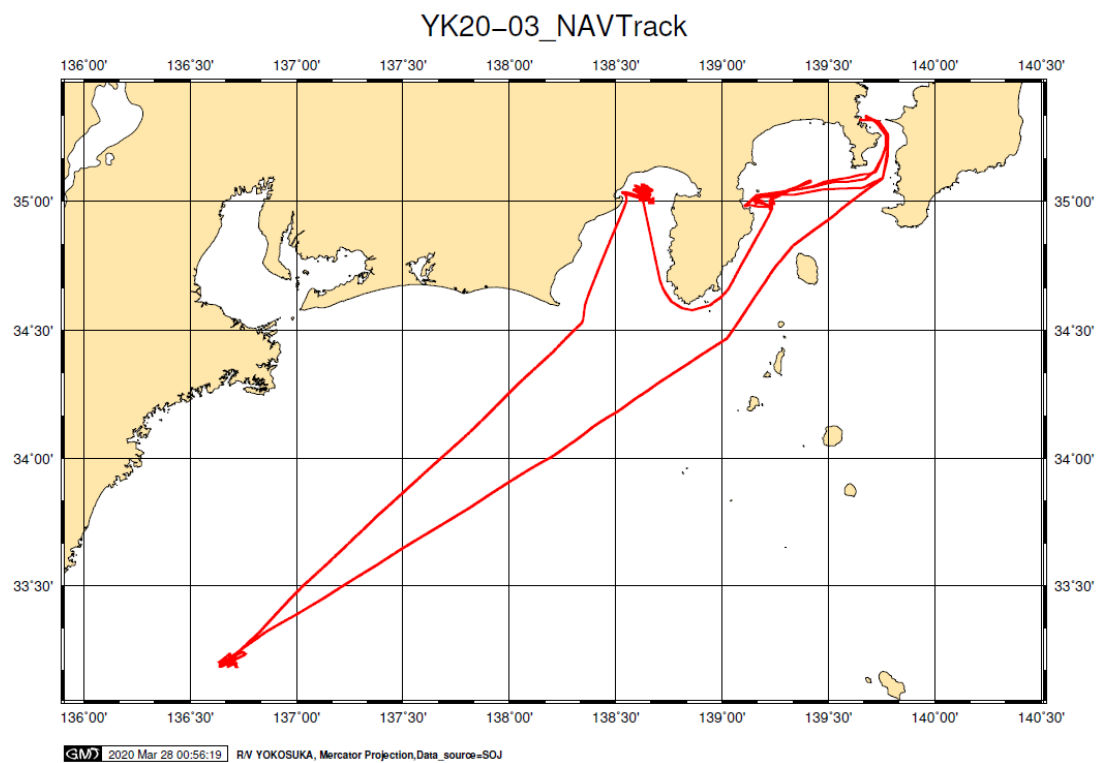


Fig1. Cruise track of YK20-03

2. Researchers

- Chief Scientist [Affiliation]: Takeshi Nakatani [JAMSTEC]
- Science party (List) [Affiliation, assignment etc.]
 - Tadahiro Hyakudome [JAMSTEC]
 - Shinobu Omika [JAMSTEC]
 - Tatsuya Aso [JAMSTEC]
 - Takafumi Omura [Clover tech Inc.]
 - Masanao Sumiyoshi [Japan Coast Guard]

3. Sea Trial of AUV “AUV-NEXT”

- Purpose

This cruise was conducted to test the whole system of "AUV-NEXT". A sidescan sonar was newly mounted after YK19-14, and wet tests and test dives were planned for its tuning. And, sea trials off Kii Peninsula were planned to verify whole system including navigation control, observation, and acoustic communication functions.

- 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 in 2018. “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.

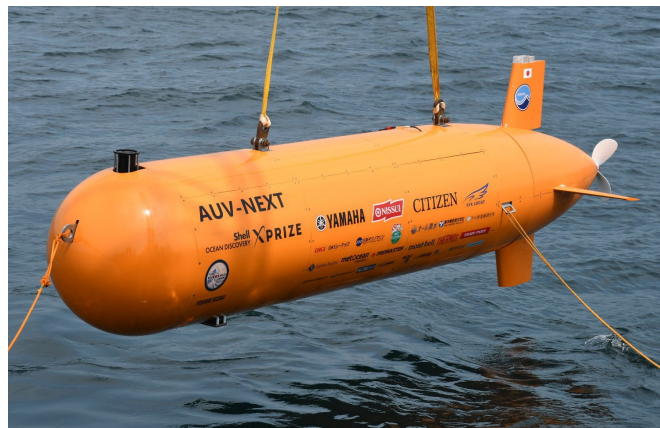


Fig.2 AUV “AUV-NEXT”

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
Max. operation depth (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 two wet tests and five dives of “AUV-NEXT”.

Table 2 Schedule of YK20-03 cruise

Date	activities
Mar. 18	Departured from YOKOSUKA (JAMSTEC pier)
Mar. 19	Wet test of AUV-NEXT; sonar test on sea surface (Sagami Bay)
Mar. 20	Wet test of AUV-NEXT; sonar test on sea surface (Sagami Bay)
Mar. 21	"AUV-NEXT" Dive#12 (Sagami bay)
Mar. 22	Rough sea state
Mar. 23	"AUV-NEXT" Dive#13 (Suruga bay)
Mar. 24	"AUV-NEXT" Dive#14 (Suruga bay)
Mar. 25	"AUV-NEXT" Dive#15 (Off Kii Peninsula)
Mar. 26	"AUV-NEXT" Dive#16 (Off Kii Peninsula) Cruised from Off Kii Peninsula to Yokosuka
Mar. 27	Rough sea state
Mar. 28	Arrived at YOKOSUKA (JAMSTEC pier)

● Results

We verified its navigation control, observation and acoustic communication functions through the sea trials. For example, the trajectory and vertical profile of Dive #14 are shown in Fig.3 and Fig.4, respectively. We tuned parameters and alignments of the instruments, especially INS and sidescan sonar, based on the observation data. The maximum operation depth during YK20-03 was 2,702m(Dive#16) off Kii Peninsula.

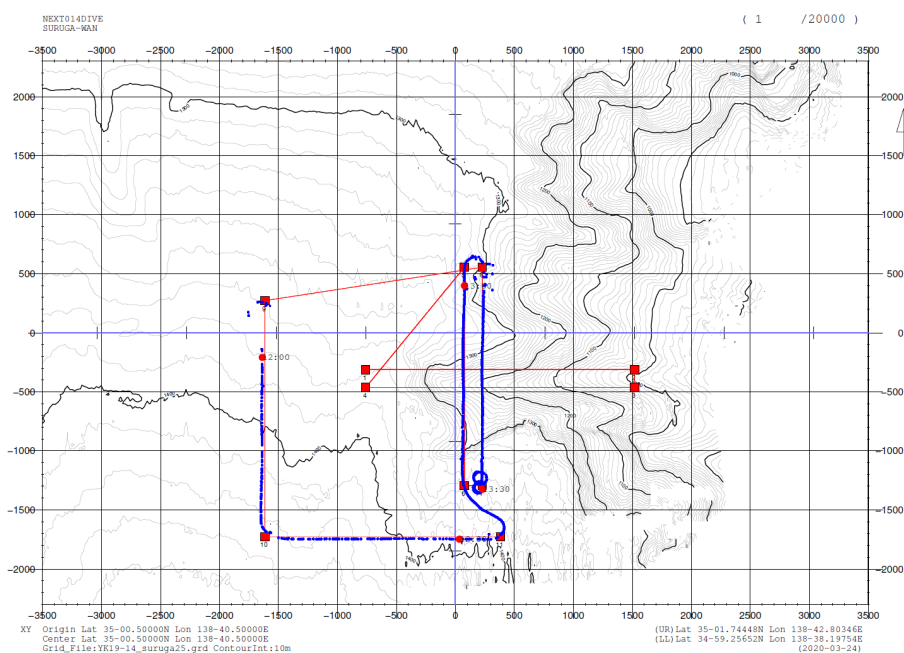


Fig.3 Trajectory of “AUV-NEXT” during Dive #14

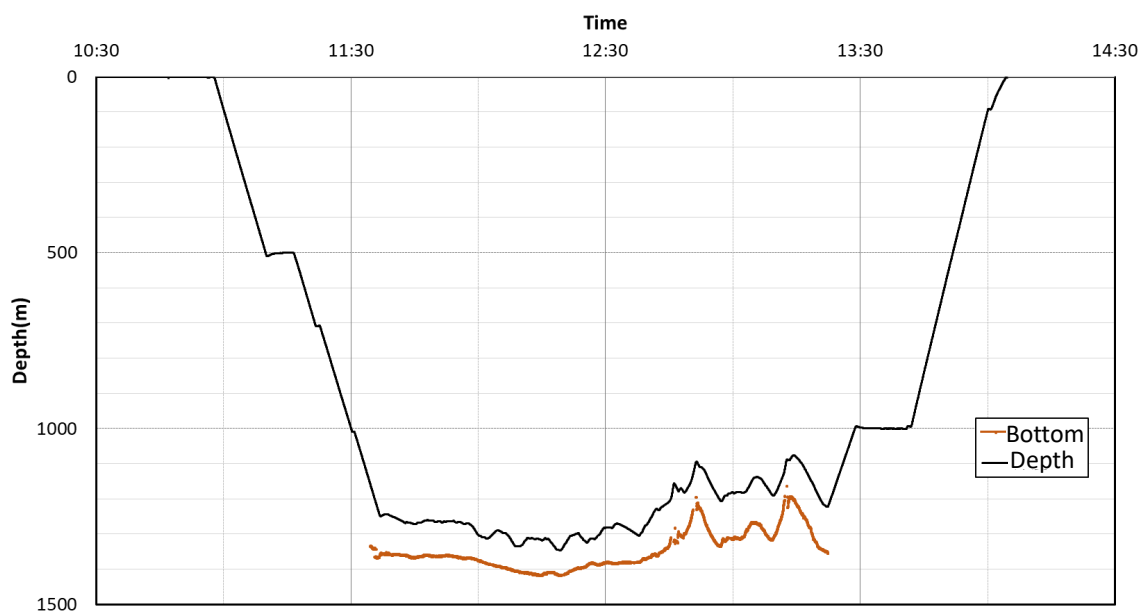


Fig.4 Vertical profile of “AUV-NEXT” during Dive #14

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.