



R/V Yokosuka Cruise Report

YK24-18

Performance verification test of URASHIMA
after conversion to 8,000m class AUV (1/2)

Suruga-Bay and Sagami-Bay

Nov. 25, 2024 - Dec. 8, 2024

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

Contents

- 1. Cruise Information**
- 2. Research Proposal and Researchers**
- 3. Performance verification test of URASHIMA after conversion to 8,000m class AUV**
- 4. Notice on Using**

1. Cruise Information

- Cruise ID: YK24-18
- Name of vessel: R/V Yokosuka
- Title of the cruise:
Performance verification test of URASHIMA after conversion to 8,000m class AUV (1/2)
- Chief Scientist: Takeshi Nakatani [JAMSTEC]
- Cruise period: November 25, 2024 – December 8, 2024
- Ports of departure / call / arrival: Yokosuka (JAMSTEC) - Yokosuka (JAMSTEC)
- Research area: Suruga Bay and Sagami Bay
- Research Map

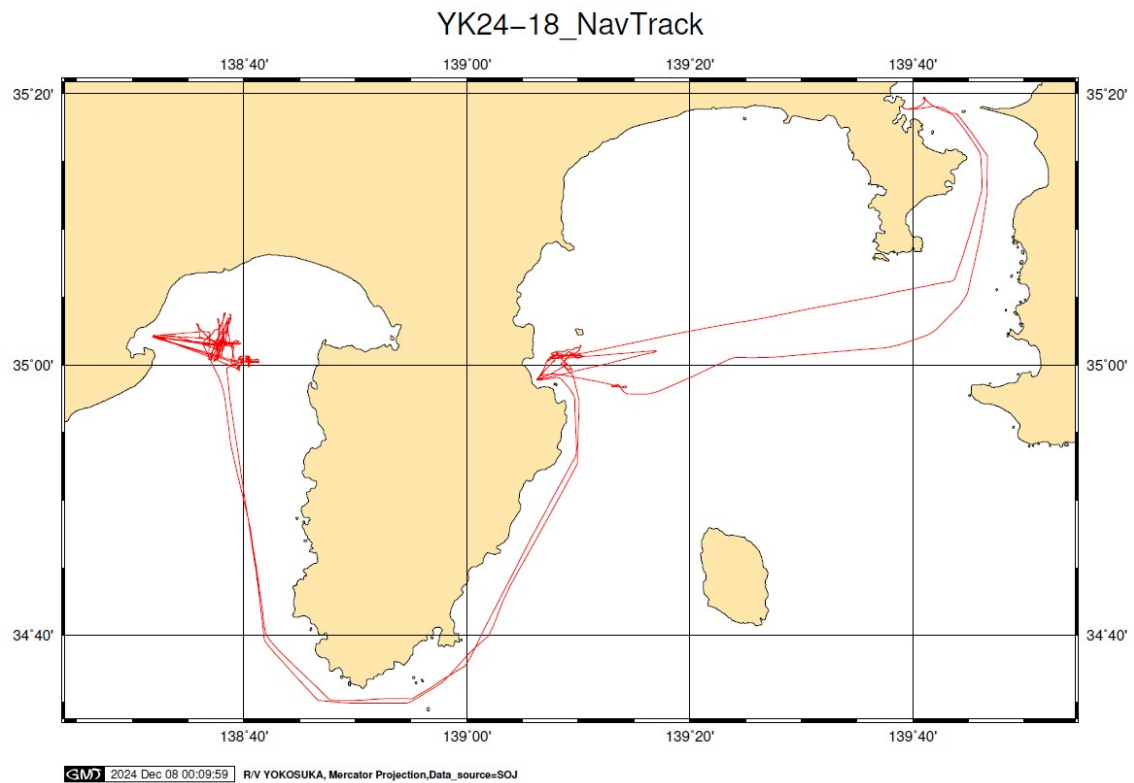


Fig.1 Cruise track of YK24-18

2. Researchers

- Title of proposal: Performance verification test of URASHIMA after conversion to 8,000m class AUV
- Chief Scientist: Takeshi Nakatani [JAMSTEC]
- Representative of the Science Party: Takuya Shimura [JAMSTEC]
- Onboard scientist:
 - Takeshi Nakatani [JAMSTEC]
 - Tatsuya Aso [JAMSTEC]
 - Yoshitaka Watanabe [JAMSTEC]
 - Takao Sawa [JAMSTEC] *1
 - Shinobu Omika [JAMSTEC]
 - Takafumi Omura [IDEA Consultants Inc.]
 - Toshikazu Nishiura [Link Laboratory Inc.]
 - Koji Meguro [Hitachi, Ltd.]
 - Susumu Kasahara [Raidou Pro] *2
 - Shinji Ozawa [Raidou Pro] *2

*1 Nov. 25, 2024 – Dec. 2, 2024

*2 Dec. 2, 2024 – Dec. 8, 2024

3. Performance verification test of URASHIMA after conversion to 8,000m class AUV

● Purpose

JAMSTEC has developed an 8,000m-class cruising type AUV by upgrading the long-established URASHIMA, with the aim of acquiring the capability to survey approximately 98% of Japan's EEZ, including the Japan Trench.

In this cruise, performance confirmation tests were conducted in shallow waters after the conversion of URASHIMA into an 8,000m-class AUV, and the acoustic communication and positioning function, navigation control function, and observation function were confirmed at a depth of 1000m.

● AUV URASHIMA 8000

Development of 3,500m class AUV URASHIMA began in 1998, and its first dive was conducted in 2000. In 2005, it achieved a continuous dive of 317 km using fuel cells, which was the longest in the world at the time. The AUV has been in practical use since 2009. The URASHIMA has been undergoing conversion to enable it to dive to depths of up to 8,000 meters.



Fig.2 AUV URASHIMA 8000

Table 1 Specifications of URASHIMA 8000

Size[L×B×H] (m)	10.7 x 1.3 x 1.5
Weight in air(ton)	7.0
Max. operation depth (m)	8,000
Cruising speed(knot)	2.5
Power supply	Li-ion

- Activities

Table 2 shows the activities of the cruise. The first sea trial of the URASHIMA 8000 was conducted for two weeks from November. 25, 2024. Firstly, we conducted wet tests of URASHIMA 8000 at Sagami Bay. Then, six dives of URASHIMA 8000 (#302-307) were carried out at Suruga Bay.

Table 2 Schedule of YK24-18 cruise

Date	Activities
Nov. 25	Departure from YOKOSUKA (JAMSTEC pier) Wet test of AUV URASHIMA 8000; sonar test on sea surface (Sagami Bay)
Nov. 26	Wet test of AUV URASHIMA 8000; sonar test on sea surface (Sagami Bay)
Nov. 27	Rough State
Nov. 28	Rough State Cruised from Sagami Bay to Suruga Bay
Nov. 29	Rough State
Nov. 30	Rough State
Dec. 1	URASHIMA 8000 Dive#302 (Suruga Bay) URASHIMA 8000 Dive#303 (Suruga Bay)
Dec. 2	Substitution of researchers at Shimizu port URASHIMA 8000 Dive#304 (Suruga Bay)
Dec. 3	URASHIMA 8000 Dive#305 (Suruga Bay)
Dec. 4	URASHIMA 8000 Dive#306 (Suruga Bay)
Dec. 5	URASHIMA 8000 Dive#307 (Suruga Bay)
Dec. 6	Rough State
Dec. 7	Rough State Bound for YOKOSUKA
Dec. 8	Arrive to YOKOSUKA (JAMSTEC pier)

- Results

Through the sea trial, the acoustic communication and positioning function, navigation control function, and observation function of URASHIMA were confirmed at a depth of 1,000m. For example, the trajectory and vertical profile of the Dive #305 are shown in Fig.3 and Fig.4, respectively. The maximum diving depth during the six dives was 1,330m(#306).

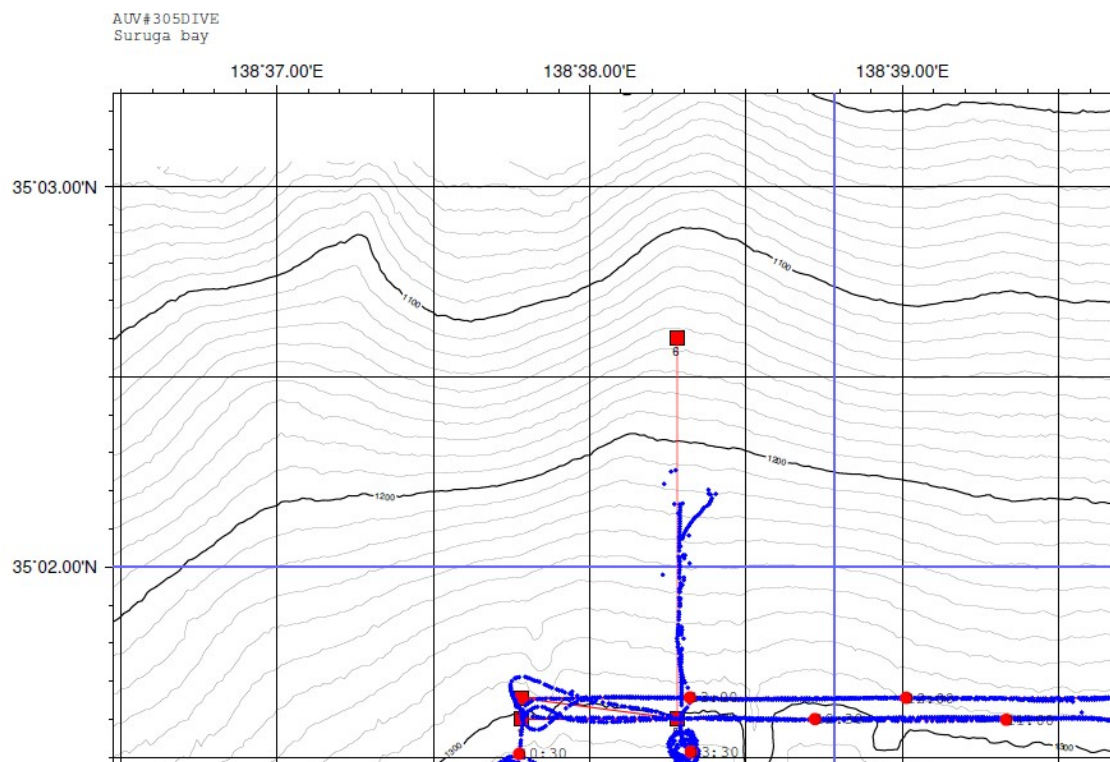


Fig.3 Trajectory of URASHIMA 8000 during Dive #305

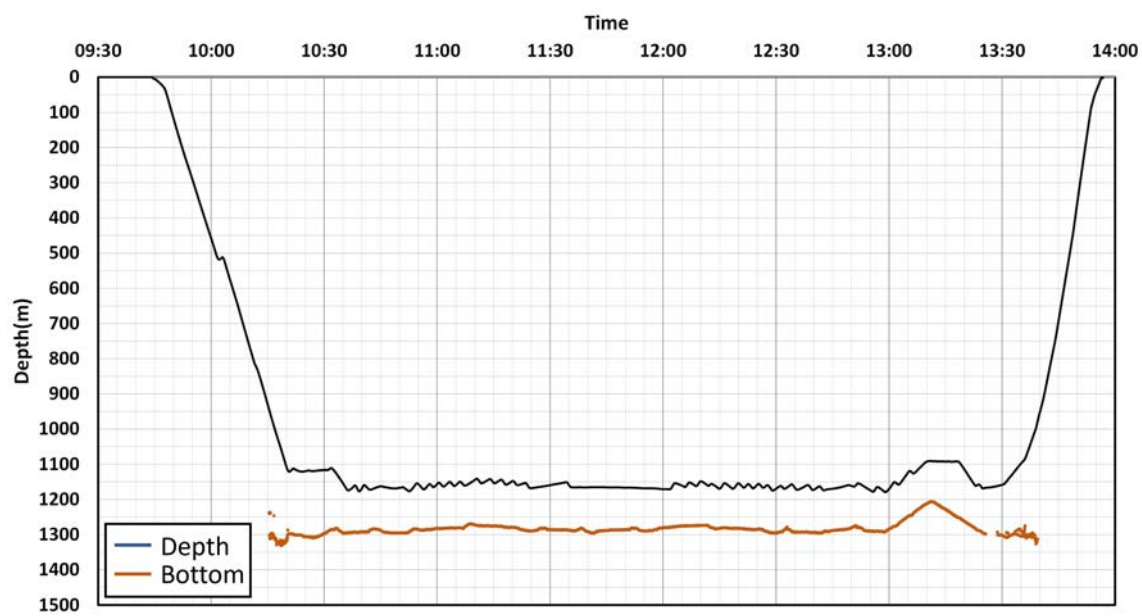


Fig.4 Vertical profile of URASHIMA 8000 during Dive #305

4. Notice on Using

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

This report is not necessarily corrected even if there is any inaccurate description (i.e. taxonomic classifications). This report is subject to be revised without notice. Some data on this report may be raw or unprocessed. If you are going to use or refer the data on this report, it is recommended to ask the Chief Scientist for latest status.

Users of information on this report are requested to submit Publication Report to JAMSTEC.

<http://www.godac.jamstec.go.jp/darwin/explain/1/e#report>

E-mail: submit-rv-cruise@jamstec.go.jp

Acknowledgement

We would like to thank the captain Takafumi Aoki and his crew of the R/V Yokosuka, and Shinkai 6500 team (Nippon Marine Enterprises, Ltd.) for AUV safe operation and great support during the cruise.