



R/V Yokosuka Cruise Report

YK25-02

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

Ogasawara Plateau, Northern edge of the Nankai Trough,
Izu-Ogasawara Trench, and Sagami-Bay
March 2, 2025 - March 15, 2025

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

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1. Cruise Information

- Cruise ID: YK25-02
- Name of vessel: R/V Yokosuka
- Title of the cruise:
Performance verification test of URASHIMA after conversion to 8,000m class AUV (2/2)
- Chief Scientist: Takeshi Nakatani [JAMSTEC]
- Cruise period: March 2, 2025 – March 15, 2025
- Ports of departure / call / arrival: Yokosuka (JAMSTEC) - Yokosuka (JAMSTEC)
- Research area: Ogasawara Plateau, Northern edge of the Nankai Trough, Izu-Ogasawara Trench, and Sagami-Bay
- Research Map

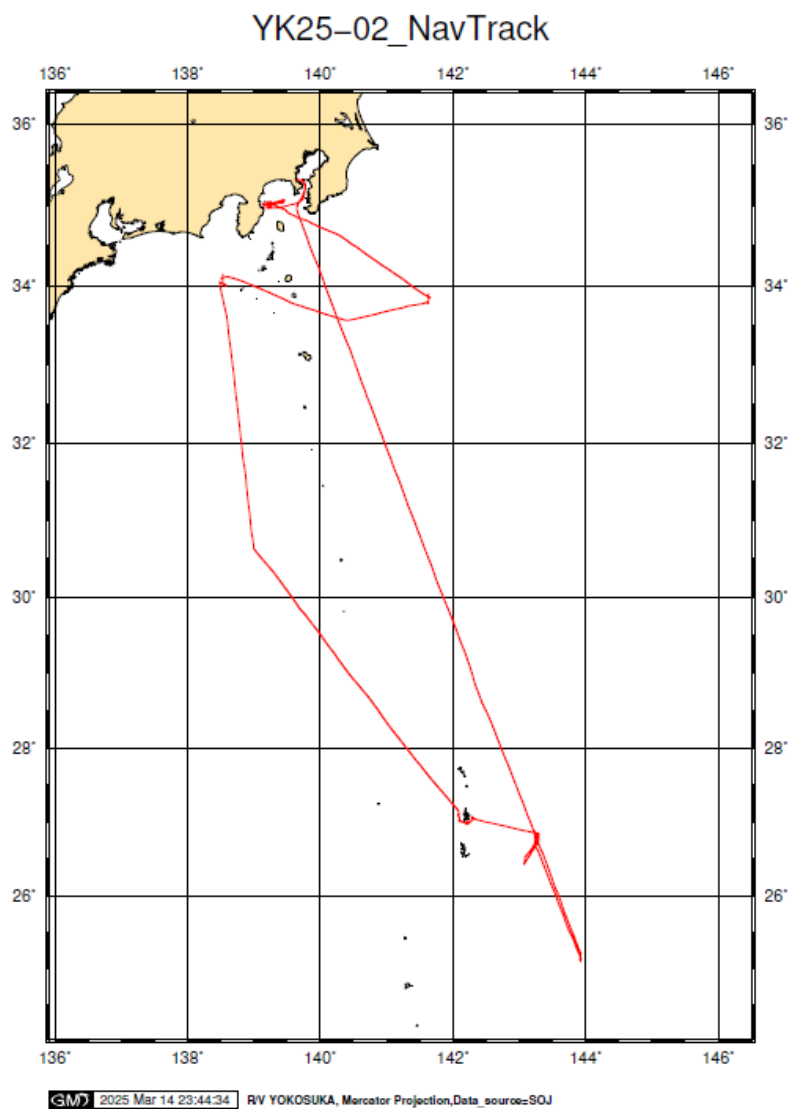


Fig.1 Cruise track of YK25-02

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]
 - Kazuya Iwashita [JAMSTEC]
 - Junji Kaneko [JAMSTEC]
 - Takafumi Omura [IDEA Consultants Inc.]
 - Koji Meguro [Hitachi, Ltd.]
 - Ryo Oyama [Nippon Marine Enterprises]

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 deep 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 6,500m.

- AUV URASHIMA 8000

The 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. The first sea trial of the URASHIMA 8000 was conducted for two weeks from November. 25, 2024 during YK24-18. Then, six dives of URASHIMA 8000 (#302-307) were carried out at Suruga Bay.



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 second sea trial of the URASHIMA 8000 was conducted for two weeks from March. 2, 2025. Six dives of URASHIMA 8000 (#308-313) were carried out.

Table 2 Schedule of YK25-02 cruise

Date	Activities
Mar. 2	Departure from YOKOSUKA (JAMSTEC pier) Cruised to Ogasawara Plateau
Mar. 3	Cruised to Ogasawara Plateau
Mar. 4	URASHIMA 8000 Dive#308 (Ogasawara Plateau)
Mar. 5	URASHIMA 8000 Dive#309 (Ogasawara Plateau)
Mar. 6	Rough State
Mar. 7	Rough State
Mar. 8	Rough State Cruised to Northern edge of the Nankai Trough
Mar. 9	Cruised to Northern edge of the Nankai Trough
Mar. 10	URASHIMA 8000 Dive#310 (Northern edge of the Nankai Trough) Cruised to Izu-Ogasawara Trench
Mar. 11	URASHIMA 8000 Dive#311 (Izu-Ogasawara Trench) Cruised to Sagami-bay
Mar. 12	Maintenance of URASHIMA
Mar. 13	URASHIMA 8000 Dive#312 (Sagami-Bay)
Mar. 14	URASHIMA 8000 Dive#313 (Sagami-Bay) Bound for YOKOSUKA
Mar. 15	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 6,500m. The maximum diving depth during the six dives was 6,606m (#309).

Next, dive tests were conducted on practical survey lines on a steep slope. For example, the trajectory and vertical profile of the Dive #312 are shown in Fig.3 and Fig.4, respectively.

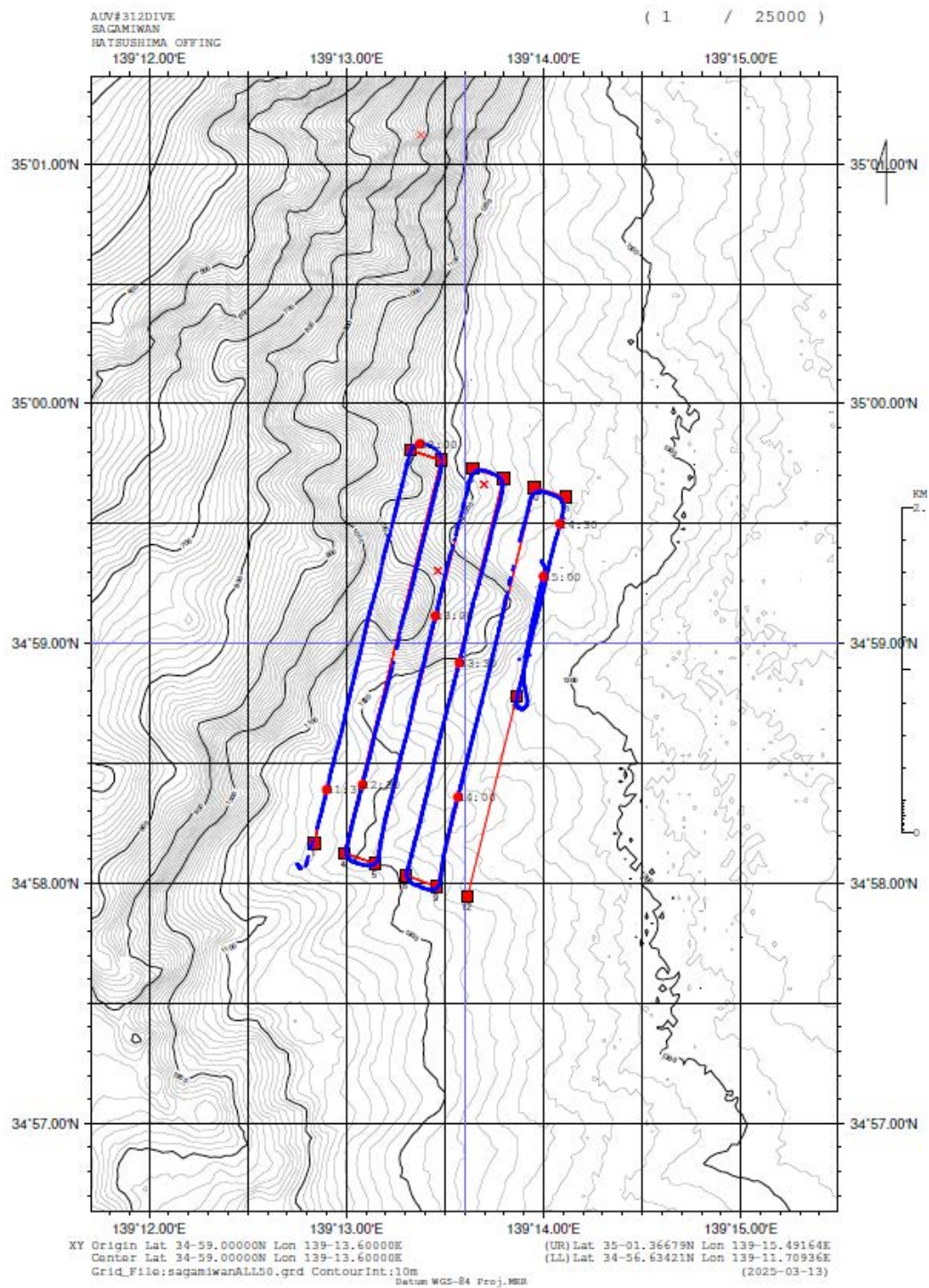


Fig.3 Trajectory of URASHIMA 8000 during Dive #312

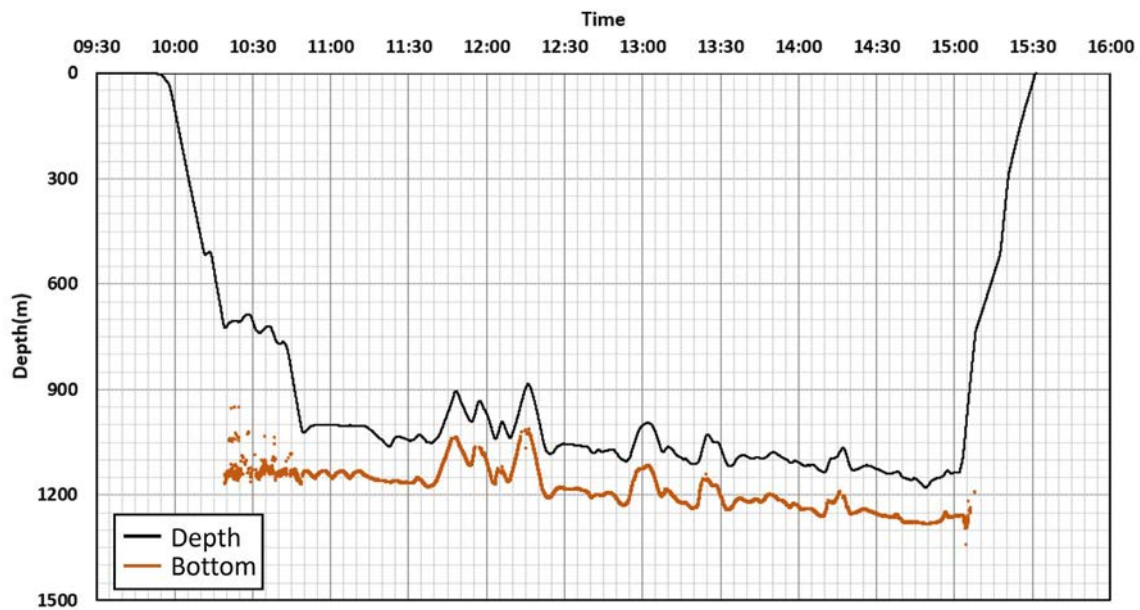


Fig.4 Vertical profile of URASHIMA 8000 during Dive #312

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.

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

Acknowledgement

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