



R/V Yokosuka Cruise Report

YK25-12

Performance verification test of URASHIMA 8000 (1/2)

Sagami-Bay, Izu-Ogasawara Trench,
Takuyo-Daisan seamount, and Japan Trench

July 19, 2025 - July 30, 2025

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

Contents

- 1. Cruise Information**
- 2. Researchers**
- 3. Performance verification test of URASHIMA 8000**
- 4. Notice on Using**

1. Cruise Information

- Cruise ID: YK25-12
- Name of vessel: R/V Yokosuka
- Title of the cruise:
Performance verification test of URASHIMA 8000 (1/2)
- Chief Scientist: Takeshi Nakatani [JAMSTEC]
- Cruise period: July 19, 2025 – July 30, 2025
- Ports of departure / call / arrival: Yokosuka (JAMSTEC) - Yokosuka (JAMSTEC)
- Research area: Sagami-Bay, Izu-Ogasawara Trench, Takuyo-Daisan seamount, and Japan Trench
- Research Map

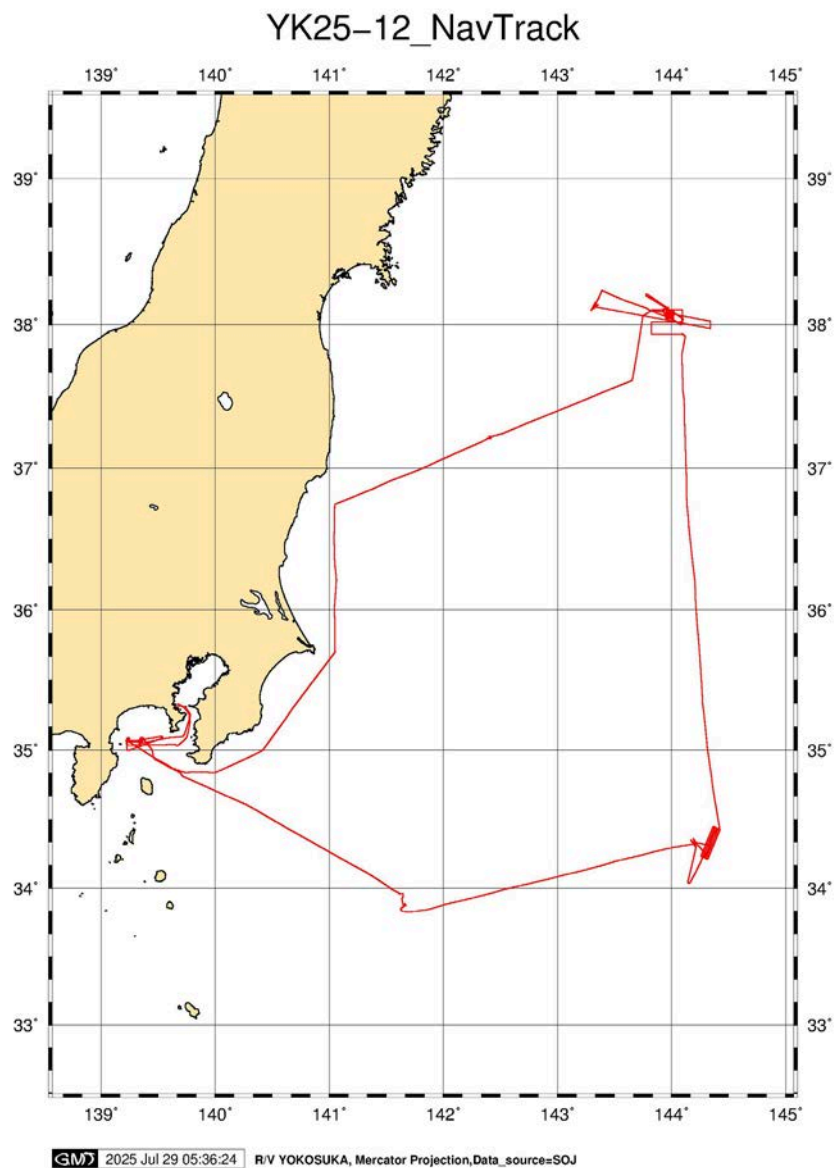


Fig.1 Cruise track of YK25-12

2. Researchers

- Title of proposal: Performance verification test of URASHIMA 8000
- 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]

Ayaka Yomoda [JAMSTEC]

Hector Lugaro [JAMSTEC]

Shinobu Omika [JAMSTEC]

Toshiya Fujiwara [JAMSTEC]

Tatsuya Kaneko [JAMSTEC]

Kazuya Kitada [JAMSTEC]

Takafumi Omura [IDEA Consultants Inc.]

Mamoru Sano [Nippon Marine Enterprises]

3. Performance verification test of URASHIMA 8000

- 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 (YK25-12), tests were conducted to evaluate URASHIMA's capability at its full operational depth of 8,000m. A series of deep-sea dives were performed to verify system reliability, pressure resistance, and long-duration operational stability. In addition, an overnight autonomous mission was successfully carried out to assess endurance, navigation accuracy, and safety management during extended operation. These results demonstrate the robustness of the upgraded URASHIMA system and its readiness for full-scale deep-sea exploration missions in the near future.

- 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 URASHIMA 8000 was conducted in November–December 2024 during YK24-18, with six dives (#302–307) carried out at Suruga Bay.

During YK25-02 in March 2025, six additional trial dives (#308–313) were conducted, totaling 29 hours and 57 minutes. These dives confirmed stable operation at depths of up to 6,500 m, demonstrated the effectiveness of electric noise countermeasures, and verified practical navigation along steep slopes simulating survey missions.



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 third sea trial of the URASHIMA 8000 was conducted from July. 19 to July. 30, 2025. Six dives of URASHIMA 8000 (#314-319) were carried out.

Table 2 Schedule of YK25-12 cruise

Date	Activities
July 19	Departure from YOKOSUKA (JAMSTEC pier) URASHIMA 8000 Dive#314 (Sagami-Bay)
July 20	URASHIMA 8000 Dive#315 (Sagami-Bay)
July 21	URASHIMA 8000 Dive#316 (Izu-Ogasawara Trench)
July 22	URASHIMA 8000 Dive#317 (Takuyo-Daisan seamount) Vessel-based bathymetric survey (Takuyo-Daisan seamount)
July 23	URASHIMA 8000 Dive#318 (Takuyo-Daisan seamount) Vessel-based bathymetric survey (Takuyo-Daisan seamount)
July 24	Transit to Japan Trough Vessel-based bathymetric survey (Japan Trough)
July 25	URASHIMA 8000 Dive#319 (Japan Trough) Overnight dive
July 26	URASHIMA 8000 Dive#319 (Japan Trough)
July 27	Vessel-based bathymetric survey (Japan Trough) Transit to Sagami-Bay
July 28	Transit to Sagami-Bay Rough sea conditions
July 29	Transit to Yokosuka Rough sea conditions
July 30	Arrival at 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 8,000m. The maximum diving depth during the six dives was 8,015.8m in Izu–Ogasawara Trench (#316). A vertical profile of Dive #316 is shown in Fig. 3, and a bathymetric map from URASHIMA 8000 survey data at 2 m grid resolution is shown in Fig. 4.

During dives #317 and #318, observations were conducted along the slopes of the Takuyo-Daisan seamount, where cobalt-rich crusts are distributed at depths ranging from 1,500 m to 5,600 m. The vehicle maintained an altitude of approximately 100 m while descending the slopes for detailed observation.

Dive #319 was conducted along the axis of the Japan Trench at depths between 7,100 m and 7,500 m. Survey-line navigation was performed for 25 hours and 34 minutes, covering approximately 76.5 nautical miles (141.7 km) and acquiring detailed bathymetric data over an area of about 41 km². In addition, a 3-component magnetometer was carried as payload to measure magnetic anomalies.

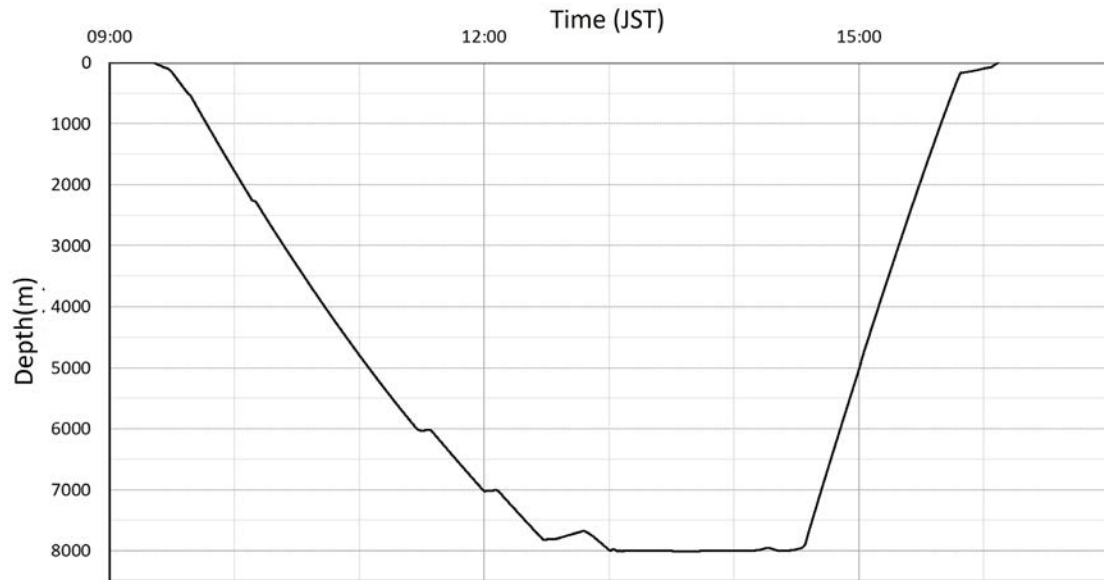


Fig.3 Vertical profile of URASHIMA 8000 during Dive #316

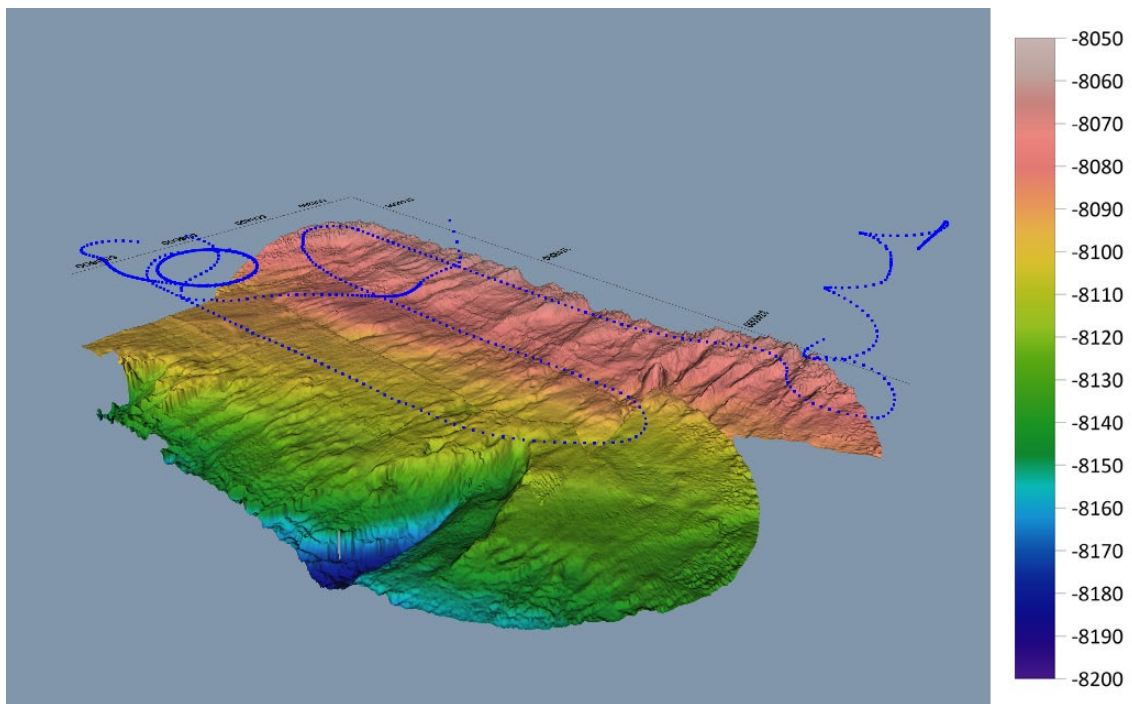


Fig.4 Bathymetric map from URASHIMA 8000 survey data at 2 m grid resolution
(Dive #316, Izu–Ogasawara Trench)

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.

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