



**S/V Yokosuka Cruise Report
YK21-19**

**High-resolution research of marine seismogenic faults in
wide area: Seismic survey and earthquake observation**

Hyuga-nada, Nankai trough

Oct. 27, 2021- Nov. 6, 2021

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

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1. Cruise Information

- Cruise ID: YK21-19
- Name of vessel: S/V Yokosuka
- Title of cruise: High-resolution research of marine seismogenic faults in wide area: Seismic survey and earthquake observation
- Chief Scientist [Affiliation]: Tsutomu Takahashi [JAMSTEC]
- Cruise period: Oct. 27, 2021 – Nov. 6, 2021
- Ports of departure / call / arrival: Yokosuka (Nissan) / Yokosuka (JAMSTEC)
- Research area: Hyuga-nada, Nankai trough
- Research map

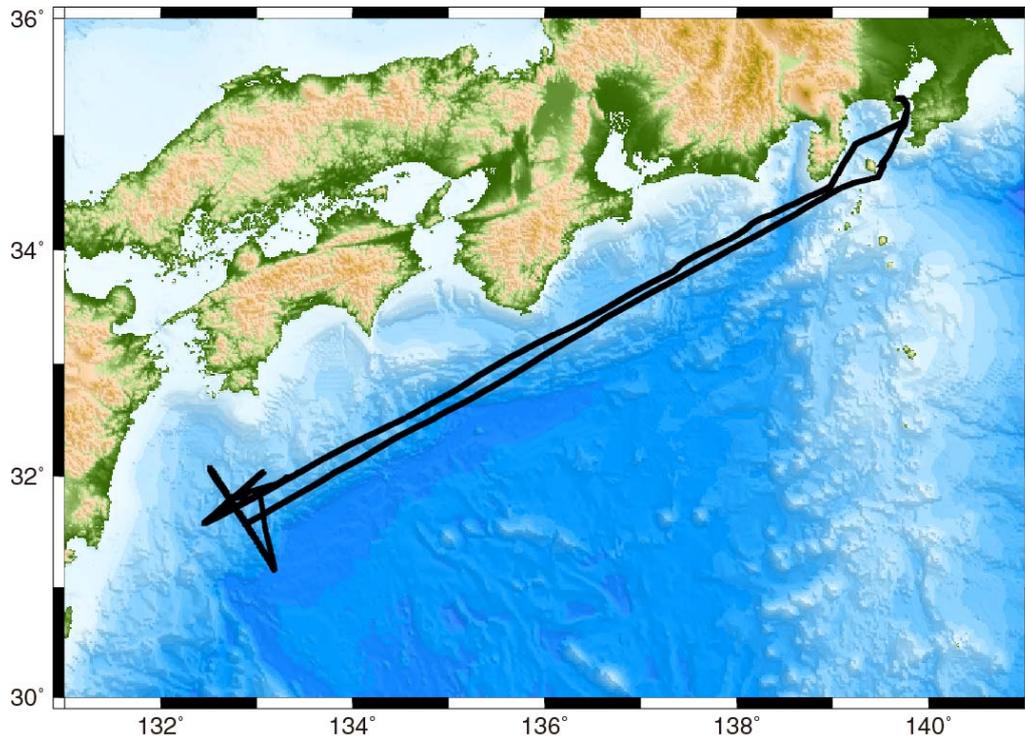


Fig 1. Ship track during YK21-19 cruise.

2. Research Proposal and Science Party

- Title of proposal
High-resolution research of marine seismogenic faults in wide area: Seismic survey and earthquake observation
- Representative of Science Party [Affiliation]
Seiichi Miura [JAMSTEC]
- Science Party (List) [Affiliation, assignment etc.]

Shuichi Kodaira	[JAMSTEC]
Yasushi Ishihara	[JAMSTEC]
Koichiro Obana	[JAMSTEC]
Seiichi Miura	[JAMSTEC]
Gou Fujie	[JAMSTEC]
Yasuyuki Nakamura	[JAMSTEC]
Ryuta Arai	[JAMSTEC]
Yuka Kaiho	[JAMSTEC]
Ayako Nakanishi	[JAMSTEC]

Tetsuo No	[JAMSTEC]
Kazuya Shiraiishi	[JAMSTEC]
Ryo Miura	[JAMSTEC]
Toshinori Saijo	[JAMSTEC]
Yanfang Qin	[JAMSTEC]
Tsutomu Takahashi	[JAMSTEC]
Takashi Tonegawa	[JAMSTEC]
Eiichiro Araki	[JAMSTEC]
Takashi Yokobiki	[JAMSTEC]
Hiroyuki Matsumoto	[JAMSTEC]
Toshinori Kimura	[JAMSTEC]
Yojiro Yamamoto	[JAMSTEC]
Yanxue Ma	[ERI, University of Tokyo]

Onboard Technician

Ikumasa Terada	[NME]
Takuya Maekawa	[NME]
Hidenori Shibata	[NME]
Taro Shirai	[NME]
Toshinori Saijo	[NME]
Haruki Doi	[NME]
Tatsuya Sugiyama	[NME]
Hiroyoshi Shimizu	[NME]
Yuki Owatari	[NME]
Takeshi Katayama	[NME]

● Crew

Captain	Tatsuo Adachi	[NME]
Chief Officer	Toshiyo Ohara	[NME]
2nd Officer	Tomohiro Yukawa	[NME]
3rd Officer	Daisuke Moriya	[NME]
Jr.3rd Officer	Yuto Obata	[NME]
Chief Engineer	Koji Funae	[NME]
1st Engineer	Kazunori Noguchi	[NME]
2nd Engineer	Kota Fujii	[NME]
3rd Engineer	Keito Shimada	[NME]
Chief Electronic Op.	Masamoto Takahashi	[NME]
2nd Electronic Op.	Misato Taki	[NME]
3rd Electronic Op.	Keisuke Oi	[NME]
Boatswain	Yosuke Kuwahara	[NME]
Quarter Master	Tsuyoshi Chimoto	[NME]
Quarter Master	Nao Ishizuka	[NME]
Quarter Master	Hotaka Honjo	[NME]
Sailor	Yuki Oishi	[NME]
Sailor	Ryo Nakanishi	[NME]
Sailor	Itsuki Tatemichi	[NME]
No.1 Oiler	Masayuki Fujiwara	[NME]
Oiler	Aoi Takamiya	[NME]
Oiler	Seiya Watanabe	[NME]
Assistant Oiler	Yutaro Ono	[NME]
Assistant Oiler	Haruki Matsumoto	[NME]
Chief Steward	Katsuyuki Omiya	[NME]
Steward	Yoshio Okada	[NME]
Steward	Seiji Honda	[NME]
Steward	Chiharu Kurosaki	[NME]
Steward	Yuta Hangai	[NME]

3. Research/Development Activities

- Objective

The cruises YK21-14, KM21-07 and YK21-19 aim at revealing three-dimensional geometry and physical properties of faults in the Nankai Trough region as described in the mid-term to long-term research plan of JAMSTEC. In the survey area ranging from the westernmost part of the Nankai Trough to the Hyuga-nada area, the plate coupling condition changes rapidly in the along-trough direction, and slow earthquakes including slow slip events and very low frequency earthquakes occur at the shallow and deep parts of the subduction zones. To reveal structural controls on the variety of slip behaviors, we have carried out a seismic refraction survey and multichannel seismic reflection surveys. For the seismic refraction survey, we have deployed 100 short-period ocean bottom seismographs (OBS) during YK21-14 cruise on the along-trough and across-trough profiles during this cruise. The seismic refraction and multichannel reflection surveys have been conducted during KM21-07 cruise. During this YK21-19 cruise, we calibrated the deployed positions of OBSs, and then recovered them.

(1) OBS recovery

We calibrated the deployed position of OBSs by using the acoustic navigation system. The OBS at site OBS099 did not respond to any commands. The OBS at site OBS073 was not released from the seafloor even though its transponder responded clearly to all commands. We recovered 98 OBSs after the calibration, and could not recover OBS073 and OBS099.

(2) Bathymetry and magnetic data

Bathymetry and magnetic data were acquired during the cruise. Bathymetry data was recorded by EM122 Multibeam Echosounder of Kongsberg. Magnetic data was acquired by SFG-1212 three component magnetometer of TERATECHNICA Inc.

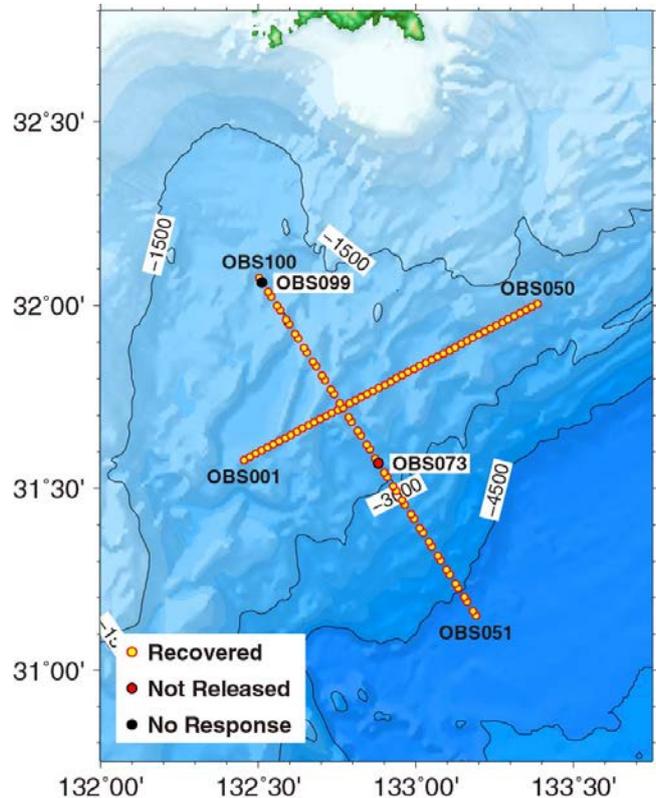


Fig. 2 Map of study area. Yellow circles represent the recovered OBSs. Black dot represents the OBS that did not respond to any commands. Red circle is the OBS that responded clearly to all commands but was not released from seafloor.

○ 4. Cruise Log

2021/10/27 (Wed)	Departure from Yokosuka Port Transit to the survey area
2021/10/28 (Thu)	Transit to the survey area OBS recovery (OBS045 -OBS050)
2021/10/29 (Fri)	OBS recovery (OBS043, 044) Standby at the survey area due to bad sea condition from 2:00
2021/10/30 (Sat)	Standby at the survey area due to bad sea condition until 6:00 OBS recovery (OBS001-018)

2021/10/31 (Sun)	OBS recovery (OBS019-027) Standby at the survey area due to bad sea condition from 9:00 to 10:00 Transit to OBS051 from OBS027 OBS recovery (OBS051-57)
2021/11/1 (Mon)	OBS recovery (OBS058-72, 74-76) At OBS073, OBS was not released even though its transponder clearly responded to all commands.
2021/11/2 (Tue)	OBS recovery (OBS077-085) Transit to OBS028 from OBS085 due to bad sea condition OBS recovery (OBS028-039)
2021/11/3 (Wed)	OBS recovery (OBS040-042, 086-98, 100) At OBS099, OBS did not respond to any commands.
2021/11/4 (Thu)	Retry of OBS recovery at OBS099 (not recovered) Retry of OBS recovery at OBS073 (not recovered) Transit to Yokosuka port
2021/11/5 (Fri)	Transit to Yokosuka port
2021/11/6 (Sat)	Arrival at Yokosuka port

● **5. 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