

YK10-15 YOKOSUKA Cruise Summary

1. Cruise Information

Cruise ID: YK10-15

Name of vessel: YOKOSUKA

Title of the cruise: Southern Mariana Trough back-arc spreading system with three different hydrothermal activities, Part 2

Cruise period: 10-17/November/2010

Ports of call: Palau - Guam

Research area: Southern Mariana Trough

Participants:

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Kyoko Okino⁶, Masanao Shinohara³, Yoshifumi Nogi⁷, Takeshi Tsuji⁸, Kimihiro Mochizuki³, Takehi Isse³, Yuki Shibata⁴, Tetsuo Matsuno¹ (Scientists on land)

Satoshi Okada⁹, Masayuki Toizumi⁹, Morifumi Takaesu⁹, Hisanori Iwamoto⁹ (Marine Technician)

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2. Overview of the Observation

We successfully recovered 10 OBEMs and 14 OBSs across the Southern Mariana Trough back-arc spreading system (Table 1). Observation started after the deployment of OBEMs and OBS during another Yokosuka cruise (YK10-10) in this August (Figure 1); the measurement of magnetic and electric field variations by OBEMs and seismic observation by OBSs at the ocean bottom. We also conduct seismic survey to investigate seismic velocity structure using 9 OBSs, an air-gun, and a single channel hydrophone streamer (Figure 2). Further, we conducted surface geophysical survey to collect multi-narrow beam bathymetry, magnetic field, and gravity field data after the instruments recovery, which cover total 340 miles in the survey area (Figure 3). These observed data will be used to provide geophysical constraint on geodynamics of the Southern Mariana Trough back-arc spreading system with three different hydrothermal activities. The observed data will be analyzed to derive upper mantle structure, crustal structure, hypocenter distribution, and tectonic history, which will provide important constraint on geodynamics of the Southern Mariana Trough back-arc spreading system with three different hydrothermal activities.

Site	Location				Depth (m)
	Latitude (N)		Longitude (E)		
	Deg.	Min.	Deg.	Min.	
EM1	13	19.25	143	02.81	3924
S1	13	11.00	143	15.06	3746
EM2	13	10.92	143	15.09	3750
S2	13	06.72	143	21.49	3550
EM3	13	06.69	143	21.56	3567

S3	13	02.37	143	27.96	3268
EM4	13	02.37	143	28.05	3254
EM5	12	58.00	143	34.53	3086
EM6	12	56.74	143	36.41	2868
S6	12	57.19	143	38.92	3075
S7	12	54.59	143	38.92	2985
EM7	12	55.43	143	38.18	3123
S8	12	53.46	143	41.27	3315
EM8	12	53.47	143	41.21	3316
S9	12	49.13	143	47.51	2585
S10	12	45.05	143	54.01	3685
EM10	12	45.09	143	53.96	3685
EM11	12	40.82	144	00.47	3750
S12	13	01.38	143	36.75	3073
S13	12	59.06	143	40.16	3135
S14	12	56.85	143	43.60	3164
S15	12	54.69	143	32.19	3103
S16	12	52.48	143	35.45	3084
S17	12	50.19	143	39.01	3541

Table 1. Observation site locations of OBEMs and OBSs recovered

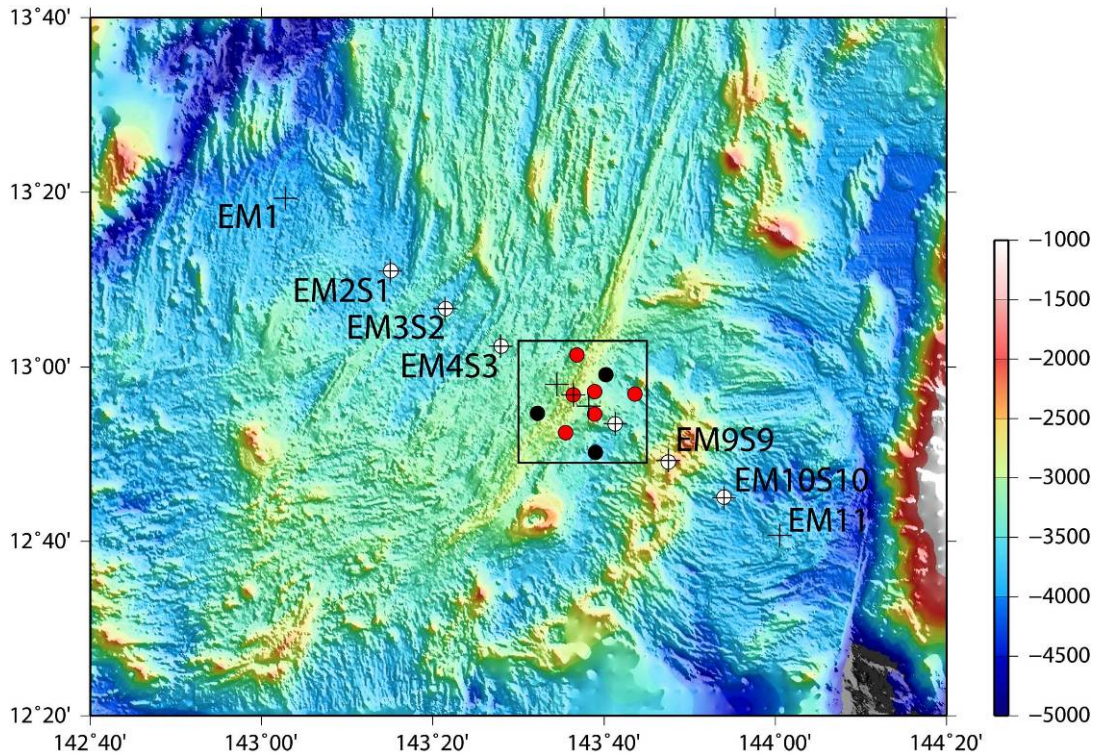


Figure 1a. Location map of OBEM (crosses) and OBS (circles). Colors of circles show different types of OBSs (white, red, and black correspond to LTOBS_ERI, STOBS_ERI, and STOBS_Chiba types of OBSs, respectively). Location of Figure 1b is shown by square.

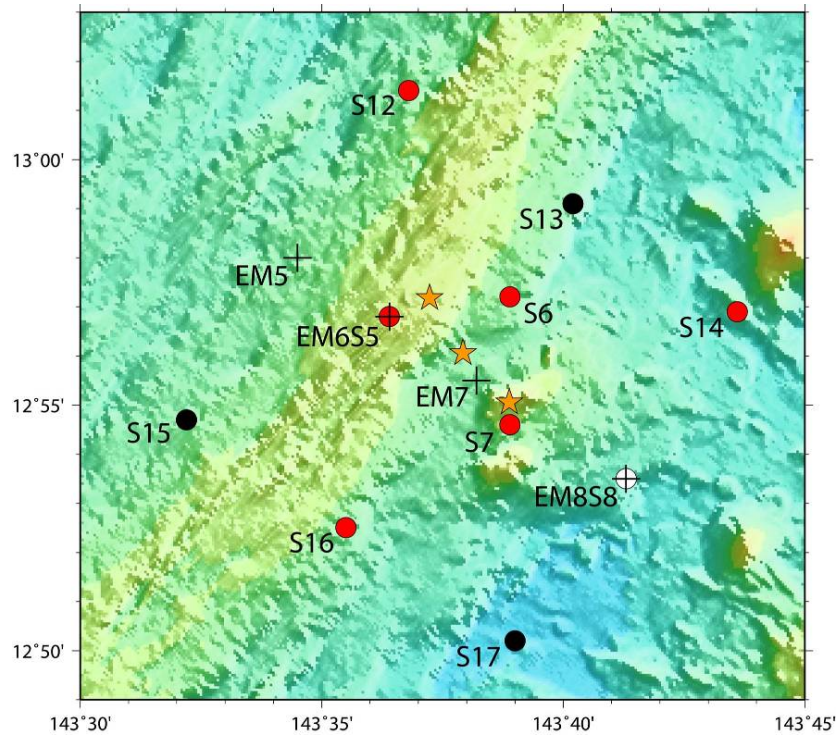


Figure 1b. Location map of OBEM and OBS near the spreading center. Symbols are the same as Figure 1a. Three hydrothermal fields that extrude different water contents are also shown by orange stars.

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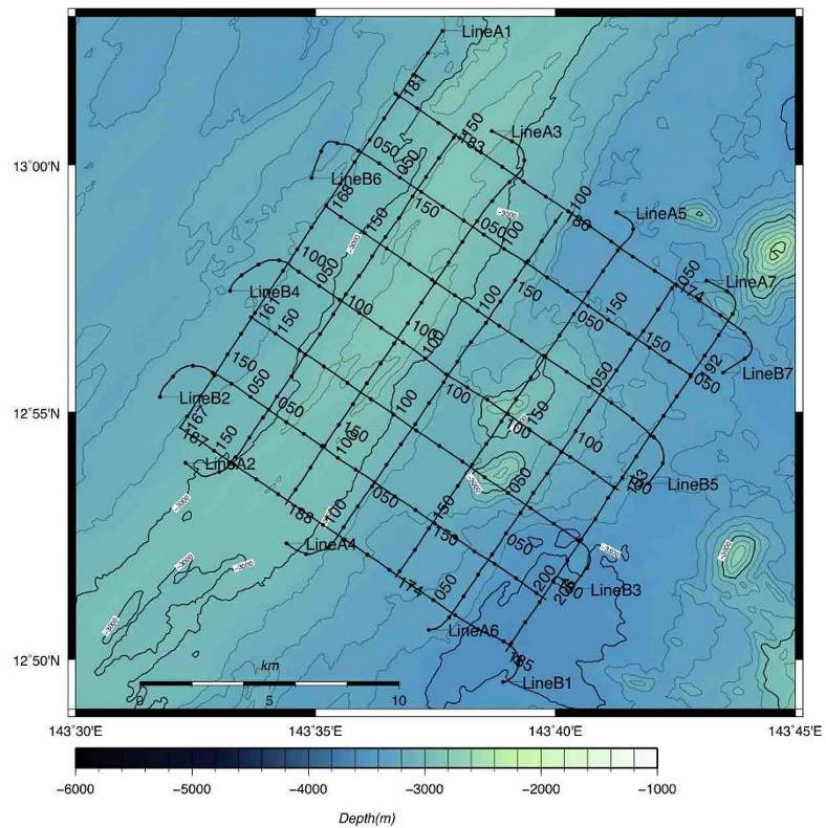


Figure 2. Location map of seismic reflection and refraction survey line. The numbers denote air-gun shot numbers of each survey line. The area is the same as Figure 1b.

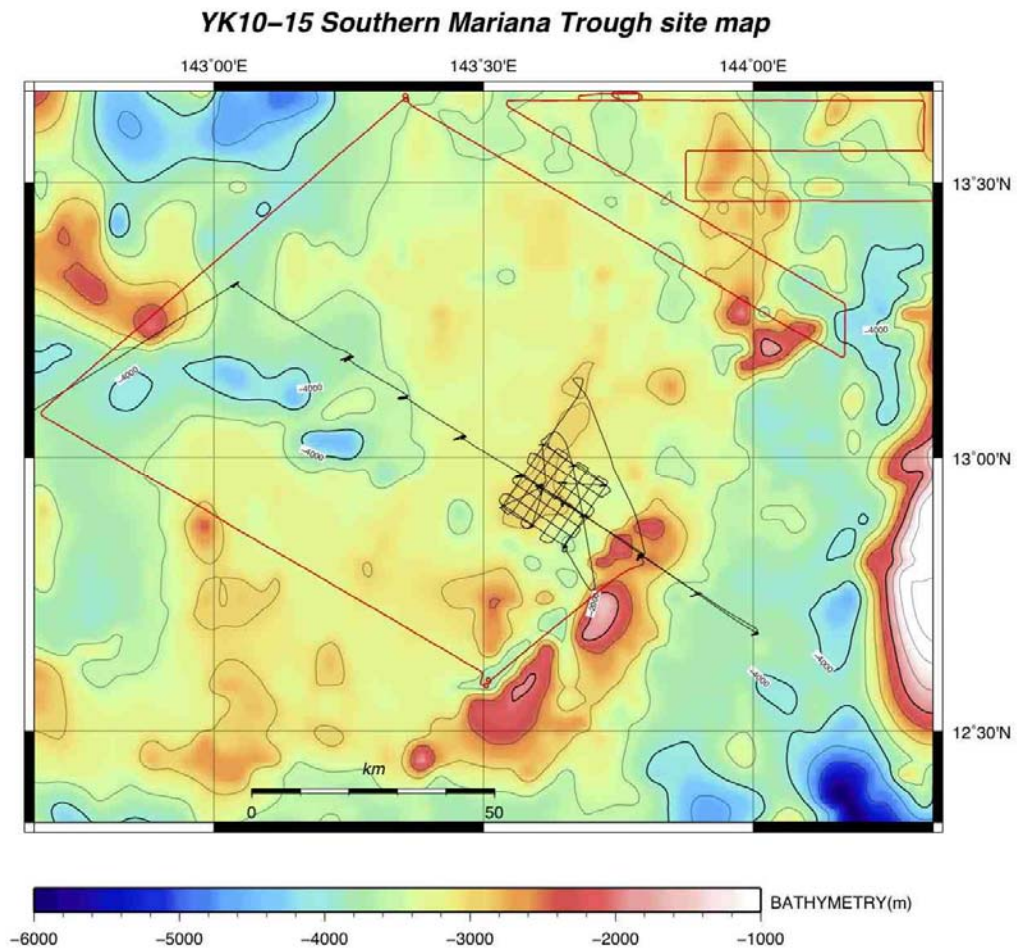


Figure 3. Ship tracks (red and black lines) of the cruise in the survey area and red lines shows ship tracks for the surface geophysical survey

Acknowledgement

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