ReC23-03 Report

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The third Repository Core Re- Discovery Program (ReCoRD) project, ReC23-03 “The Japan Sea paleoceanography and paleoclimatology during the Miocene”, was conducted for 10 days from July 3rd to July 12th, 2024. In this project, we aim to reconstruct the paleoclimatic and paleoceanographic histories of the Japan Sea during the Miocene with higher temporal resolution and precision than previous studies. Especially, we are focusing on:

1) centennial- to millennial-scale oceanographic changes recorded in laminated sediments.

2) paleoenvironmental reconstruction in the Japan Sea during and after a rapid warming event (~10.8 Ma) which was reported in the South China Sea (Holbourn et al., 2021).

To achieve these objectives, ReC23-03 attempts to refine the existing age models of the old ODP and IODP cores and obtain a higher-resolution chronology. We try to reconstruct the paleoceanographic changes of the Japan Sea in three dimensional space and with a high temporal resolution by precisely correlating the sediments from five target sites with various water depths.

We reanalyzed sediment cores from Sites 794, 795, and 797 drilled by ODP Leg 127 (1989) and from Sites U1425 and U1430 drilled by IODP Exp. 346 (2013). The scanning images, X-ray CT images, and high-resolution continuous chemical profiles measured by an XRF core scanner (ITRAX), which took two months to acquire, were obtained prior to the sampling party and were used during the sampling party. For example, we used Zr profile measured by the XRF core scanner for identification of zircon-enriched tephra for dating, Br profile for estimation of sample volumes necessary for organic geochemical analysis, and Br/S and Fe/Ti ratios for appropriate sampling of oxidizing and reducing layers. We discussed the origin of characteristic layers found from chemical profiles during the sampling party, leading to additional target samplings. We also prepared larger volume homogenized samples and shared them among five laboratories for specific intervals of common interests to reconstruct paleoceanographic changes from multiple proxies.

As participants could always refer to the elemental profiles during the sampling party, participants including those with limited experience such as students could utilize those data to confirm their visual description. In addition, the more experienced participants carefully taught the less experienced participants how to identify the lithology and choose appropriate samples, so that the less experienced members gradually improved their sampling skills. Thus we fulfilled ReCoRD's mission of providing educational opportunities for younger generations.

Due to the large number of samples required, an additional sampling party was carried out in October 2024. Analyses of the collected samples is currently in progress, and a wide range of scientific outcomes in expected.

Schedule of sampling party

Wed. 3rd July	Welcome meeting, orientation, sampling of cores from Site U1425
Thu. 4th July	Sampling of cores from Site U1425
Fri. 5th July	Sampling of cores from Site U1425
Sat. 6th July	Sampling of cores from Sites U1425 and U1430, Event of Nagoya City Science Museum
Sun. 7th July	Sampling of cores from Site U1430
Mon. 8th July	Sampling of cores from Site U1430
Tue. 9th July	Sampling of cores from Sites U1430 and 794 Research presentation at KCC seminar
Wed. 10th July	Sampling of cores from Sites 794 and 797
Thu. 11th July	Sampling of cores from Site 797
Fri. 12th July	Sampling of cores from Sites 797 and 795
Fri. 19th July	Sampling party wrap-up meeting (online)

Participants (Affiliations are at the time of participation.)

Takuto Ando (Akita University), Masayuki Ikeda (the University of Tokyo), Tomohisa Irino* (Hokkaido University), Yuji Kato (Kochi University), Yusuke Kuwahara (University of Tokyo), Daisuke Kuwano (Kyoto University), Arisa Seki (Shinshu University), Ryuji Tada (Chiba Institute of Technology), Fumiko Nara (JAEA), Hiroki Hayashi (Shimane University), Kenji Matsuzaki (the University of Tokyo), Hironao Matsumoto (Tsukuba University), Kazuhide Mimura (GSJ, AIST), An-Sheng Lee* (National Taiwan University), Kosei Yamaguchi (Toho University), Jumpei Yoshioka (GSJ, AIST)　　*Data requester

Student Participants (Affiliations are at the time of participation.)

Chiaki Aoyagi (Hokkaido University), Naoko Ono (Toho University), Nao Taniguchi (Hokkaido University), Mizuki Tojima (the University of Tokyo), Masato Nosakon (Toho University), Kotaro Hoshi (Hokkaido University)

Student assistants

Shunsuke Tagaya (Shinshu University), Shuangning Tang (Shinshu University)

JAMSTEC Curator

Yusuke Kubo (IODP Core Curator)

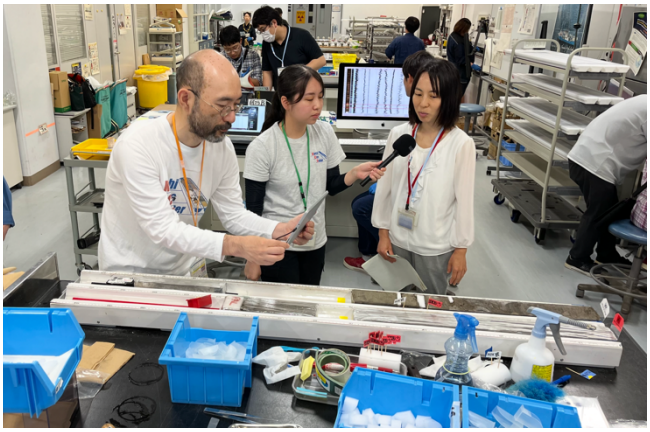
ReCoRD manager in Kochi University

Minoru Ikehara (Kochi University), Yuji Kato (Kochi University)

On-line participants

Cédric M. John*（Queen Mary University of London）　*Data requester

Participants in the sampling room



Live broadcast to the Nagoya City Science Museum

Group dinner during the sampling party

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