

Proceedings of the International Ocean Discovery Program

Volume 370

Temperature Limit of the Deep Biosphere off Muroto

Expedition 370 of the riser drilling platform

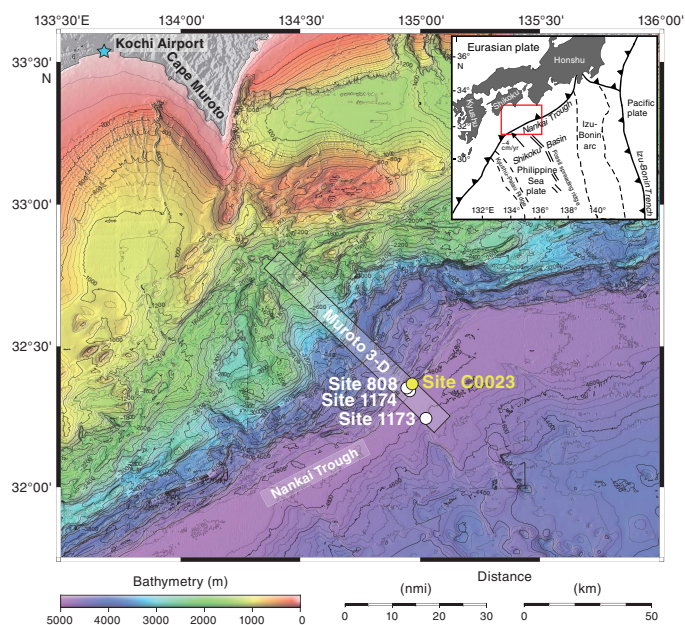
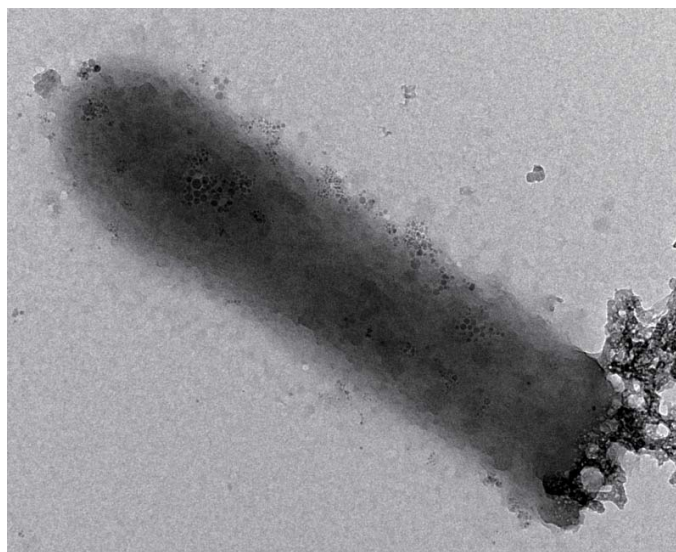
Shimizu, Japan, to Kochi, Japan

Site C0023

10 September–23 November 2016

Volume authorship

Heuer, V.B., Inagaki, F., Morono, Y., Kubo, Y., Maeda, L., and the Expedition 370 Scientists



Publisher's notes

This publication was prepared by the D/V *Chikyu* Science Operator, the Center for Deep Earth Exploration (CDEX), at the Japan Agency for Marine-Earth Science and Technology (JAMSTEC) and the *JOIDES Resolution* Science Operator (JRSO) at Texas A&M University (TAMU) as an account of work performed under the International Ocean Discovery Program (IODP). Funding for IODP is provided by the following international partners:

National Science Foundation (NSF), United States
Ministry of Education, Culture, Sports, Science and Technology (MEXT), Japan
European Consortium for Ocean Research Drilling (ECORD)
Ministry of Science and Technology (MOST), People's Republic of China
Korea Institute of Geoscience and Mineral Resources (KIGAM)
Australia-New Zealand IODP Consortium (ANZIC)
Ministry of Earth Sciences (MoES), India
Coordination for Improvement of Higher Education Personnel (CAPES), Brazil

Any opinions, findings, and conclusions or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the participating agencies, TAMU, or Texas A&M Research Foundation.

Shipboard-collected data from this expedition are accessible at <http://sio7.jamstec.go.jp>.

Supplemental data were provided by the authors and may not conform to IODP publication formats.

Some core photographs have been tonally enhanced to better illustrate particular features of interest. High-resolution images are available upon request.

Cover photograph shows transmission electron micrographs of a microorganism separated and sorted from sediment (Section 370-C0023A-6F-2; 304 m below seafloor). Copyright JAMSTEC.

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Examples of how to cite this volume or part of this volume are available at <http://publications.iodp.org/proceedings/370/370title.html#bib>.

ISSN

World Wide Web: 2377-3189

Volume DOI

<https://doi.org/10.14379/iodp.proc.370.2017>

Publication date

23 November 2017

Contents

Expedition reports

Chapters

[Expedition 370 summary](#)

V.B. Heuer et al.

[Expedition 370 methods](#)

Y. Morono et al.

[Site C0023](#)

V.B. Heuer et al.

Core descriptions

Visual core descriptions (VCDs) are presented in PDF files for each site. Smear slides and/or thin sections are presented in PDF and/or CSV files for each site and/or hole (CSV files are available in the CORES directory). The entire set of core images in PDF is available in the IMAGES directory.

[Site C0023](#)

[Visual core descriptions](#) · [Smear slides](#) · [Thin sections](#)

Supplementary material

Supplementary material for the Volume 370 expedition reports includes structure information and microbiology, X-ray diffraction, and X-ray fluorescence data in Microsoft Excel format; scanning electron microscope data in Microsoft PowerPoint format; smear slide images and descriptions in JPG and CSV formats; thin section images in JPG format; and scanned visual core description and

structural geology observation sheets in PDF. A full list of directories can be found in SUPP_MAT in the volume zip folder or on the [Supplementary material for Volume 370 expedition reports](#) web page.

Expedition research results

Data reports

Titles are available in [HTML](#).

Syntheses

Titles are available in [HTML](#).

Drilling location maps

A site map showing the drilling locations for this expedition and maps showing the drilling locations of all International Ocean Discovery Program (IODP) expeditions, produced using QGIS (<http://www.qgis.org>), and all Integrated Ocean Drilling Program, Ocean Drilling Program (ODP), and Deep Sea Drilling Project (DSDP) expeditions, produced using Generic Mapping Tools (GMT) of Paul Wessel and Walter H.F. Smith (<http://gmt.soest.hawaii.edu>), are available in PDF.

[IODP Expedition 370 site map](#)

[IODP map](#) (Expeditions 349–357, 359–362, 364, 365, and 370)

[Integrated Ocean Drilling Program map](#) (Expeditions 301–348)

[ODP map](#) (Legs 100–210)

[DSDP map](#) (Legs 1–96)

Acknowledgments

The authors would like to express appreciation to the T-Limit Project Coordination Team for their thoughtful planning and continuous support to the expedition. In particular, the authors would like to thank Dr. Masataka Kinoshita for his contribution to the successful installation of the temperature observatory.

Foreword

The International Ocean Discovery Program (IODP) represents the latest incarnation of almost five decades of scientific ocean drilling excellence and is generally accepted as the most successful international collaboration in the history of the Earth sciences. IODP builds seamlessly on the accomplishments of previous phases: the Deep Sea Drilling Project, Ocean Drilling Program, and Integrated Ocean Drilling Program. The 2013–2023 IODP Science Plan (*Illuminating Earth's Past, Present, and Future*) defines four themes and thirteen challenges for this decade of scientific ocean drilling that are both of fundamental importance in understanding how the Earth works and of significant relevance to society as the Earth changes, at least in part in response to anthropogenic forcing. This phase of IODP represents a renewed level of international collaboration in bringing diverse drilling platforms and strategies to increasing our understanding of climate and ocean change, the deep biosphere and evolution of ecosystems, connections between Earth's deep processes and surface manifestations, and geologically induced hazards on human timeframes.

The *Proceedings of the International Ocean Discovery Program* presents the scientific and engineering results of IODP drilling projects, expedition by expedition. As in the preceding Integrated Ocean Drilling Program, expeditions in the new IODP are conducted by three implementing organizations, each providing a different drilling capability. These are the US Implementing Organization (USIO; through September 2014) and the *JOIDES Resolution* Science Operator (JRSO; as of October 2014), providing the leased commercial vessel *JOIDES Resolution* for riserless drilling operations; JAMSTEC's Center for Deep Earth Exploration (CDEX), providing the drillship *Chikyu* for riser and occasional riserless operations; and the European Consortium for Ocean Research Drilling (ECORD) Science Operator (ESO), providing "mission-specific" platforms (MSPs) for expeditions that extend the IODP operational range where neither drillship is suitable, for example, in polar environments and in shallow waters. Scheduling decisions for each capability are made by three independent Facility Boards, each of which includes scientists, operators, and platform funding partners: the *JOIDES Resolution* Facility Board (JRFB), *Chikyu* IODP Board (CIB), and ECORD Facility Board (EFB). At the beginning of the new IODP, the three Facility Boards agreed to utilize Publication Services at the USIO and now the JRSO for production of all expedition *Proceedings* volumes and reports.

The new IODP differs from prior scientific ocean drilling programs in that it has neither a central management organization nor commingled funding for program-wide activities. Yet this phase of IODP retains a fundamental integrative structural element: a "bottom-up" evaluation of all proposals for drilling expeditions by a single advisory structure composed of scientists representing all international program partners. International scientists may submit drilling proposals to the Science Support Office; all submitted proposals are then evaluated by a Science Evaluation Panel in the context of the Science Plan.

The new IODP also has a second internationally integrative level for high-level discussion and consensus-building: the IODP Forum. The Forum is charged with assessing program-wide progress toward achieving the Science Plan. At present, IODP involves 26 international financial partners, including the United States, Japan, an Australia/New Zealand consortium (ANZIC), Brazil, China, India, South Korea, and the eighteen members of ECORD (Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Israel, Italy, the Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland, and the United Kingdom). This enhanced membership in the new IODP represents a remarkable level of international collaboration that remains one of the greatest ongoing strengths of scientific ocean drilling.

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Expedition-related bibliography*

IODP publications

Scientific Prospectus

Hinrichs, K.-U., Inagaki, F., Heuer, V.B., Kinoshita, M., Morono, Y., and Kubo, Y., 2016. *Expedition 370 Scientific Prospectus: T-Limit of the Deep Biosphere off Muroto (T-Limit)*. International Ocean Discovery Program. <https://doi.org/10.14379/iodp.sp.370.2016>

Preliminary Report

Heuer, V.B., Inagaki, F., Morono, Y., Kubo, Y., Maeda, L., and the Expedition 370 Scientists, 2017. *Expedition 370 Preliminary Report: Temperature Limit of the Deep Biosphere off Muroto*. International Ocean Discovery Program. <https://doi.org/10.14379/iodp.pr.370.2017>

Proceedings volume

Heuer, V.B., Inagaki, F., Morono, Y., Kubo, Y., Maeda, L., and the Expedition 370 Scientists, 2017. *Temperature Limit of the Deep Biosphere off Muroto*. Proceedings of the International Ocean Discovery Program, 370: College Station, TX (International Ocean Discovery Program). <https://doi.org/10.14379/iodp.proc.370.2017>

Expedition reports

Heuer, V.B., Inagaki, F., Morono, Y., Kubo, Y., Maeda, L., Bowden, S., Cramm, M., Henkel, S., Hirose, T., Homola, K., Hoshino, T., Ijiri, A., Imachi, H., Kamiya, N., Kaneko, M., Lagostina, L., Manners, H., McClelland, H.-L., Metcalfe, K., Okutsu, N., Pan, D., Raudsepp, M.J., Sauvage, J., Schubotz, F., Spivack, A., Tonai, S., Treude, T., Tsang, M.-Y., Viehweger, B., Wang, D.T., Whitaker, E., Yamamoto, Y., and Yang, K., 2017. Expedition 370 summary. In Heuer, V.B., Inagaki, F., Morono, Y., Kubo, Y., Maeda, L., and the Expedition 370 Scientists, *Temperature Limit of the Deep Biosphere off Muroto*. Proceedings of the International Ocean Discovery Program, 370: College Station, TX (International Ocean Discovery Program). <https://doi.org/10.14379/iodp.proc.370.101.2017>

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<https://doi.org/10.14379/iodp.proc.370.102.2017>

Heuer, V.B., Inagaki, F., Morono, Y., Kubo, Y., Maeda, L., Bowden, S., Cramm, M., Henkel, S., Hirose, T., Homola, K., Hoshino, T., Ijiri, A., Imachi, H., Kamiya, N., Kaneko, M., Lagostina, L., Manners, H., McClelland, H.-L., Metcalfe, K., Okutsu, N., Pan, D., Raudsepp, M.J., Sauvage, J., Schubotz, F., Spivack, A., Tonai, S., Treude, T., Tsang, M.-Y., Viehweger, B., Wang, D.T., Whitaker, E., Yamamoto, Y., and Yang, K., 2017. Site C0023. In Heuer, V.B., Inagaki, F., Morono, Y., Kubo, Y., Maeda, L., and the Expedition 370 Scientists, *Temperature Limit of the Deep Biosphere off Muroto*. Proceedings of the International Ocean Discovery Program, 370: College Station, TX (International Ocean Discovery Program).

<https://doi.org/10.14379/iodp.proc.370.103.2017>

Supplementary material

Heuer, V.B., Inagaki, F., Morono, Y., Kubo, Y., Maeda, L., and the Expedition 370 Scientists, 2017. Supplementary material, <https://doi.org/10.14379/iodp.proc.370supp.2017>. Supplement to Heuer, V.B., Inagaki, F., Morono, Y., Kubo, Y., Maeda, L., and the Expedition 370 Scientists, *Temperature Limit of the Deep Biosphere off Muroto*. Proceedings of the International Ocean Discovery Program, 370: College Station, TX (International Ocean Discovery Program). <https://doi.org/10.14379/iodp.proc.370.2017>

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