Proceedings of the International Ocean Discovery Program

Volume 360

Southwest Indian Ridge Lower Crust and Moho

Expedition 360 of the riserless drilling platform
Colombo, Sri Lanka, to Port Louis, Mauritius
Site U1473
30 November 2015–30 January 2016

Volume authorship
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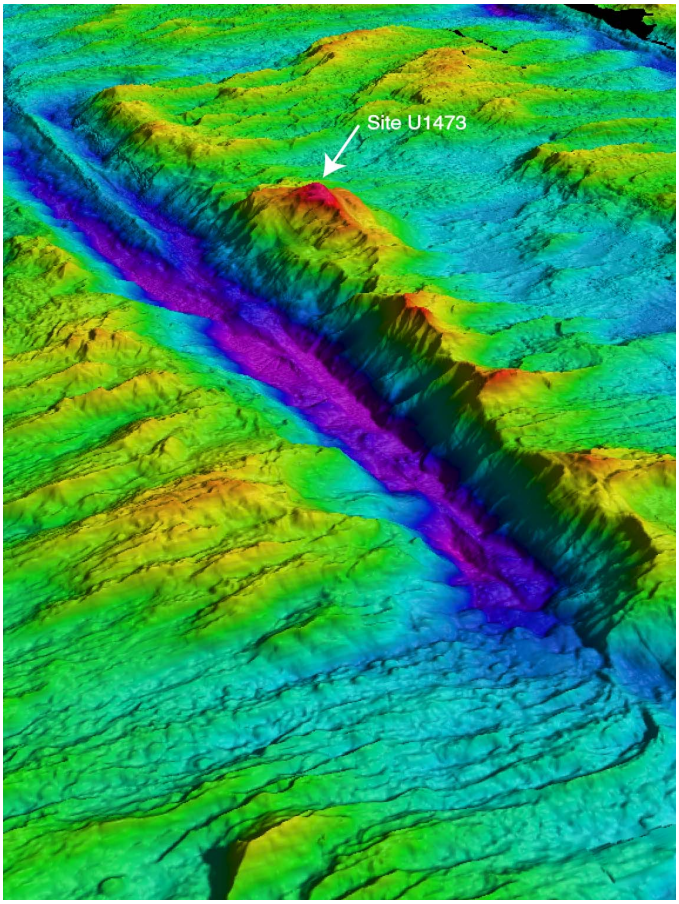

Published by
International Ocean Discovery Program

Publisher's notes

This publication was prepared by 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.

The bulk of the shipboard-collected core data from this expedition is accessible at **http://iodp.tamu.edu/database/index.html**. If you cannot access this site or need additional data, please contact Data Librarian, International Ocean Discovery Program *JOIDES Resolution* Science Operator, Texas A&M University, 1000 Discovery Drive, College Station TX 77845-9547, USA. Tel: (979) 845-8495; Fax: (979) 458-1617; Email: **database@iodp.tamu.edu**.

A complete set of the logging data collected during the expedition is available at **http://brg.ldeo.columbia.edu/logdb**. If you have problems downloading the data, wish to receive additional logging data, or have questions regarding the data, please contact Database Administrator, Borehole Research Group, Lamont-Doherty Earth Observatory of Columbia University, PO Box 1000, 61 Route 9W, Palisades NY 10964, USA. Tel: (845) 365-8343; Fax: (845) 365-3182; Email: **logdb@ldeo.columbia.edu**.

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

JRSO expedition photos are the property of IODP and are in the public domain.

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

Cover photograph shows the R/V *JOIDES Resolution* at night. Cover site map shows oblique view of the Atlantis II Transform fault looking north-northeast; Atlantis Bank and Site U1473 (red) form the northernmost and shallowest portion of the transverse ridge on the eastern flank of the transform. Photo credit: Chris MacLeod and IODP JRSO.

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Examples of how to cite this volume or part of this volume are available at **http://publications.iodp.org/proceedings/360/360title.html#bib**.

ISSN
World Wide Web: 2377-3189

Publication date
30 January 2017

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

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Visual core descriptions · **Thin sections**

Site 1105
Visual core descriptions · **Thin sections**

Supplementary material

Supplementary material for the Volume 360 expedition reports includes affine tables and shifting method in Microsoft Excel and CSV format, DESClogik workbooks in Microsoft Excel, web galleries of photomicrographs and thin section images in JPG, lithology averaging information in Microsoft Word and Matlab, operations summary in Microsoft Excel, paleomagnetism data in Microsoft Excel and CSV format, petrophysics data in Microsoft Excel and ASCII, and filtering information in Microsoft Word and Matlab. A full list of directories can be found in SUPP_MAT in the volume zip folder or on the **Supplementary material for Volume 360 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), produced using QGIS (**http://www.qgis.org**), and 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 360 site map
IODP map (Expeditions 349–357, 359, and 360)
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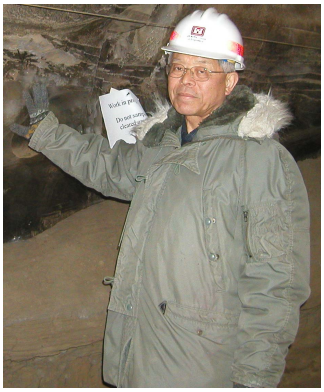
Dedication



This volume is dedicated to Hajimu Kinoshita, whose leadership of three site survey cruises supported by the Japan Agency for Marine-Earth Science and Technology was critical to documenting the geology of Atlantis Bank, a key prerequisite for enabling the SloMo Project and for reaching the crust/mantle boundary. Photo credit: K. Akazawa, copyright JAMSTEC.

Acknowledgments

The members of the IODP Expedition 360 science party would like to thank the Siem Offshore crew and IODP support staff on board the R/V *JOIDES Resolution* during Expeditions 360 and 362T for their outstanding professionalism, skill, and extraordinary dedication at all stages of the project. The sense of camaraderie and shared mission of these individuals with the scientific party made the cruise a wonderful and noteworthy experience. The IODP JRSO Publications staff at TAMU are thanked for their help and particularly for their patience during the production of this document. The Japan Agency for Marine-Earth Science and Technology, UK Natural Environment Research Council, US National Science Foundation, and Canada National Sciences and Engineering Research Council are acknowledged with gratitude for their funding of the site surveys of Atlantis Bank.

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

Dick, H.J.B, MacLeod, C.J., and Blum, P., 2015. *Expedition 360 Scientific Prospectus: Southwest Indian Ridge Lower Crust and Moho.* International Ocean Discovery Program. **http://dx.doi.org/10.14379/iodp.sp.360.2015**

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Supplementary material

MacLeod, C.J., Dick, H.J.B., Blum, P., and the Expedition 360 Scientists, 2017. Supplementary material, **http://dx.doi.org/10.14379/iodp.proc.360supp.2017**. *Supplement to* MacLeod, C.J., Dick, H.J.B., Blum, P., and the Expedition 360 Scientists, *Southwest Indian Ridge Lower Crust and Moho*. Proceedings of the International Ocean Discovery Program, 360: College Station, TX (International Ocean Discovery Program). http://dx.doi.org/10.14379/iodp.proc.360.2017

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