

Proceedings of the International Ocean Discovery Program

Volume 395

Reykjanes Mantle Convection and Climate

Expedition 384 of the R/V *JOIDES Resolution*

Kristiansand, Norway, to Las Palmas, Canary Islands (Spain)

Sites U1554 and U1555

20 July–24 August 2020

Expedition 395 of the R/V *JOIDES Resolution*

Ponta Delgada, Portugal, to Reykjavík, Iceland

Sites U1554, U1562, U1564, and U1602

12 June–12 August 2023

Expedition 395C of the R/V *JOIDES Resolution*

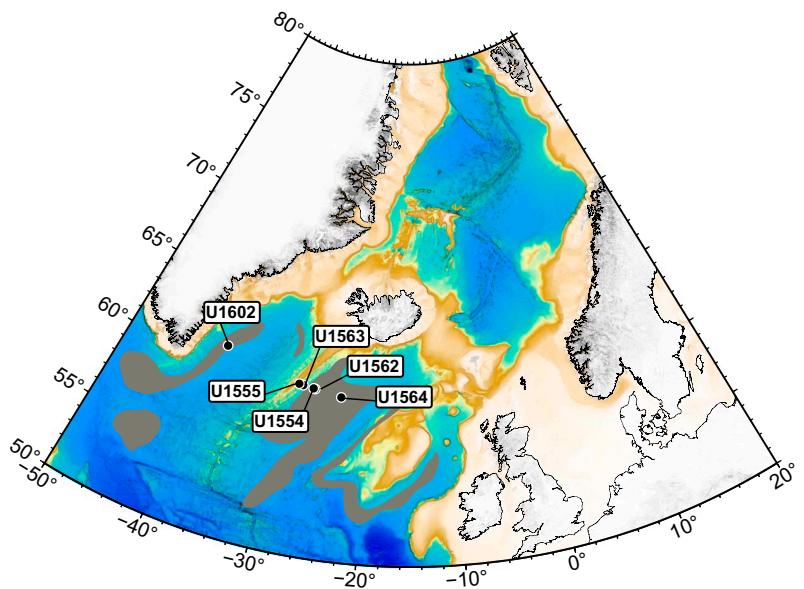
from and to Reykjavík, Iceland

Sites U1554, U1555, and U1562–U1564

5 June–6 August 2021

Volume authorship

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The bulk of the shipboard-collected core data from this expedition is accessible at <https://zenodo.org/comunities/iodp> (see list of **available data sets**). 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 (database@iodp.tamu.edu).

A complete set of the logging data collected during the expedition is available at http://mlp.ldeo.columbia.edu/logdb/scientific_ocean_drilling. 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 (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 public access.

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

Cover photograph shows contact between ~12 My old olivine phryic basaltic basement and overlying chalk, cored on crustal V-shaped Ridge 3 and Bjorn drift (395C-U1562A-64X-CC). Photo credit: Ross Parnell-Turner and IODP JRSO.

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Core descriptions

Visual core descriptions (VCDs) are presented in PDF files for each site. Thin sections, smear slides, and/or tabular information for each site or hole are presented in tab-separated value (TSV) or PDF format in the CORES directory. The entire set of core images in PDF is available in the IMAGES directory.

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Supplementary material

Supplementary material for the Volume 395 expedition reports includes cleaned physical properties data and dissolved oxygen concentrations in Microsoft Excel format. A full list of directories can be found in SUPP_MAT in the volume zip folder or on the [Supplementary material for Volume 395 expedition reports](#) web page.

Expedition research results

Data reports

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 (<https://www.generic-mapping-tools.org>), are available in PDF.

[IODP Expedition 395 site map](#)

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[ODP map](#) (Legs 100–210)

[DSDP map](#) (Legs 1–96)

Acknowledgments

Advancing knowledge about Earth's atmosphere, oceans, and deep interior is of critical importance to present and future generations of society. Expedition 395 set out to explore the links between mantle convection, deepwater oceanic circulation, and the evolution of oceanic crust that could only be achieved by scientific ocean drilling. We thank the IODP proposal review panels and the *JOIDES Resolution* Facility Board for their encouragement and support through a review process that began in 2004, leading to the opportunity to access the extraordinary capabilities of the R/V *JOIDES Resolution* to achieve our goals.

All aspects of Expedition 395 were heavily impacted by the COVID-19 pandemic. The success of this expedition was only made possible by the exceptional dedication and sacrifices of the SIEM crew members, *JOIDES Resolution* Science Operator (JRSO) technical and shore-based staff, Schlumberger engineers, and Entier catering teams under unprecedented circumstances, and we deeply thank them.

We thank the captains and crew of *JOIDES Resolution* during Expeditions 384, 395C, and 395 for their commitment and professionalism, and we thank the JRSO shipboard laboratory technicians for their phenomenal attitude and hard work. Finally, we thank the Icelandic Coast Guard for making their vessel *Pór* available to deliver essential drilling equipment during Expedition 395. The geophysical site survey information for Proposal 892 was collected during the NERC-sponsored Cruise JC50 aboard RRS *James Cook* in summer 2010.

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 an intense 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 current IODP phase 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 Institute for Marine-Earth Exploration and Engineering (MarE3), 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 current 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 current 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 current IODP also has an international integrative level for high-level discussion and global consensus-building: the IODP Forum. The Forum is not only charged with assessing program-wide progress toward achieving the current Science Plan, but also with overseeing approaches toward a new bright future of scientific ocean drilling post 2023. At present, IODP involves 22 international funding agencies, including those from the United States, Japan, an Australia/New Zealand consortium (ANZIC), China, India, South Korea, and the 15 members of ECORD (Austria, Canada, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom). The IODP membership represents an unparalleled level of international scientific collaboration; one of the greatest and ongoing strengths of scientific ocean drilling.

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