

Proceedings of the International Ocean Discovery Program

Volume 364

Chicxulub: Drilling the K-Pg Impact Crater

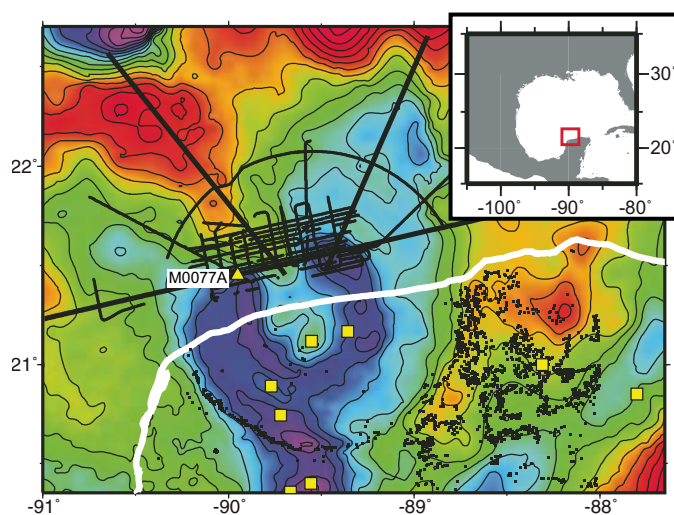
Expedition 364 of the mission-specific drilling platform
from and to Progresso, Mexico

Site M0077

5 April–31 May 2016

Volume authorship

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Publisher's notes

This publication was prepared by the European Consortium for Ocean Research Drilling (ECORD) Science Operator (ESO) and 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 or TAMU.

Expedition 364 was funded in part by the International Continental Scientific Drilling Program (ICDP).

IODP mission-specific platform data are accessible at <http://iodp.pangaea.de>. If you cannot access this site or need additional data, please contact Data Librarian, PANGAEA, University of Bremen, MARUM, Leobener Strasse 8, 28359 Bremen, Germany. Tel: (40) 421-218-65592; Fax: (49) 421-218-65505.

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, 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.

ESO 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 the *L/B Myrtle* on station at Site M0077. Insets: (left) thin section photomicrograph showing early Danian planktic foraminifers and a bloom of calcareous dinoflagellates from Core 364-M0077A-39R, (middle) line-scan image of suevite in Core 364-M0077A-89R, (right) shatter cone in amphibolite clast in Core 366-M0077A-81R. Photo credit: Chris Lowery (*L/B Myrtle*), Ludovic Ferrière (shatter cone), and IODP ESO.

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Examples of how to cite this volume or part of this volume are available at <http://publications.iodp.org/proceedings/364/364title.html#bib>.

ISSN

World Wide Web: 2377-3189

Volume DOI

<https://doi.org/10.14379/iodp.proc.364.2017>

Publication date

30 December 2017

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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 M0077](#)

[Visual core descriptions · Thin sections](#)

Supplementary material

Supplementary material for the Volume 364 expedition reports includes age-depth, MAR, MAD, and fault-slip data in Microsoft Excel format; CT images, CT scans, core line-scan images, and slab core scans in JPG format; handwritten VCDs in PDF; and CT descriptions in a variety of native formats. A full list of directories can be found in SUPP_MAT in the volume zip folder or on the [Supplementary material for Volume 364 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 364 site map](#)

[IODP map](#) (Expeditions 349–357, 359–361, 364, and 365)

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

[ODP map](#) (Legs 100–210)

[DSDP map](#) (Legs 1–96)

Acknowledgments

We thank the National Science Foundation (NSF) and the Natural Environment Research Council (NERC) for funding the acquisition of seismic data, which allowed the spectacular images of the Chicxulub crater that were fundamental to site selection for Expedition 364. We thank the European Consortium for Ocean Research Drilling (ECORD) Science Operator (ESO) staff; Expedition 364 was implemented by Dave McInroy, with Dave Smith directing operations offshore. We are grateful to our Science Party members from México, the Universidad Nacional Autónoma de México, and the Yucatan State Government and Dr Raúl Godoy in particular for their contributions and support, without which the expedition would not have been possible. The International Continental Scientific Drilling Program (ICDP) provided funds for downhole operations and in kind support for the DOSECC-operated drilling rig. We thank Uli Harms in particular for many years of encouragement. We thank the Captain and crew of the *L/B Myrtle* for getting us there. We also thank the DOSECC drillers, who could not quite understand our excitement about recovering hundreds of meters of granite, Chris Delahunty for forsaking weeks of sleep to solve a myriad of drilling challenges, and Beau Marshall for going to great lengths onshore to make sure key rig parts arrived rapidly to the platform to minimize downtime. We thank ESO technical staff, including Erwan Le Ber for acting as the key go-between for the physical properties scientists and the shore-based management and Luzie Schnieders for being absolutely critical to the success of the geochemical and microbiological sampling and measurements offshore and onshore. Weatherford Labs and Enthought acquired and processed—unique to the International Ocean Discovery Program (IODP)—a dual-energy X-ray computed tomography (CT) data set of our cores. We specifically thank Barry Newton for the rapid and careful scanning; Brendon Hall for the continuous tutoring and updating of the CT data set; Eric Jones for in-kind support, including use of Enthought's VirtualCore software; and Hans-Joachim Wallrabe-Adams for making these data available for the Onshore Science Party and integrating with CoreWall for visual core descriptions. We are grateful to the Center for Marine Environmental Sciences (MARUM) staff, especially the leadership of Ursula Röhl, who deftly balanced institutional and programmatic needs with multiple requests from scientists, which allowed us to maximize the scientific output from these unique cores from the Chicxulub impact crater. And we thank the IODP Publications staff, who carried on working long after we had disappeared for dinner. Lastly, thanks to all of the families of the expedition team members for their support before, during, and after our adventures in México and Germany.

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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JOIDES Resolution Science Operator

Website: <http://iodp.tamu.edu>

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*At time of publication.

Expedition-related bibliography*

IODP publications

Scientific Prospectus

Gulick, S., Morgan, J., and Mellett, C.L., 2016. *Expedition 364 Scientific Prospectus: Chicxulub: drilling the K-Pg impact crater*. International Ocean Discovery Program. <http://dx.doi.org/10.14379/iodp.sp.364.2016>

Preliminary Report

Gulick, S., Morgan, J., Mellett, C.L., and the Expedition 364 Scientists, 2017. *Expedition 364 Preliminary Report: Chicxulub: Drilling the K-Pg Impact Crater*. International Ocean Discovery Program. <http://dx.doi.org/10.14379/iodp.pr.364.2017>

Proceedings volume

Morgan, J., Gulick, S., Mellett, C.L., Green, S.L., and the Expedition 364 Scientists, 2017. *Chicxulub: Drilling the K-Pg Impact Crater*. Proceedings of the International Ocean Discovery Program, 364: College Station, TX (International Ocean Discovery Program). <https://doi.org/10.14379/iodp.proc.364.2017>

Expedition reports

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Supplementary material

Morgan, J., Gulick, S., Mellett, C.L., Green, S.L., and the Expedition 364 Scientists, 2017. Supplementary material, <https://doi.org/10.14379/iodp.proc.364supp.2017>. *Supplement to Morgan, J., Gulick, S., Mellett, C.L., Green, S.L., and the Expedition 364 Scientists, Chicxulub: Drilling the K-Pg Impact Crater*. Proceedings of the International Ocean Discovery Program, 364: College Station, TX (International Ocean Discovery Program). <https://doi.org/10.14379/iodp.proc.364.2017>