



# **PROCEEDINGS OF THE INTEGRATED OCEAN DRILLING PROGRAM**

## **VOLUME 329 EXPEDITION REPORTS SOUTH PACIFIC GYRE SUBSEAFLOOR LIFE**

Expedition 329 of the riserless drilling platform  
Papeete, Tahiti, to Auckland, New Zealand  
Sites U1365–U1371  
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A complete set of the logging data collected by IODP-USIO Science Services, Lamont-Doherty Earth Observatory (LDEO), is available at [brg.ldeo.columbia.edu/logdb/](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:

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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 deployment of the Secchi disk. Photograph by John Beck.

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# Foreword

## By Integrated Ocean Drilling Program Management International, Inc.

The Integrated Ocean Drilling Program (IODP) is now in the latter half of its decadal program (2003–2013). As envisioned in the Initial Science Plan (ISP), IODP expeditions take advantage of three scientific ocean drilling platforms that enable us to cover unprecedented areas of wide oceans, from ice-covered shallow water to full ocean depths. Drilling miles of depth below seafloor, now part of IODP capabilities, is the major advance from the program predecessors, the Deep Sea Drilling Project and the Ocean Drilling Program. The living Earth is a dynamic system that is continuously evolving. IODP seeks to understand this complex and unique system through scientific ocean drilling, sampling, and experimenting in deep holes, along with advancement of related scientific disciplines. IODP is an international collaboration among scientists and nations with keen aspirations to attain the scientific goals of the ISP. IODP currently includes participating members from 24 nations.

The *Proceedings* present the scientific and engineering results of IODP drilling projects, each designed to better understand the past, present, and future of the Earth system.

IODP expeditions begin with scientists who submit research drilling proposals to test new and innovative ideas, then the proposals progress to international scientific advisors (Science Advisory Structure) who nurture, evaluate, rank, and prioritize proposals. Scientists also schedule the science operations, select science party members from scores of international scientists qualified to participate, plan platform operations, ready the drillship, and choose borehole locations. The science party, collectively and individually, conducts science on board and on shore. The co-chief scientists on each expedition are responsible for synthesizing the scientific results as hallmark of expedition.

Ocean-drilling achievements help us to understand and interpret phenomena in various parts of the Earth system. Achievements in the two legacy drilling programs have validated the scientific concepts behind plate tectonics, contributed to the understanding of ocean circulation changes, and extended our knowledge of long- and short-term climate change. IODP is truly an expansion and extension of the scientific research conducted by the legacy programs, engaging in cutting-edge research concerning topics of global importance.

IODP drilling platform operations are conducted by three Implementing Organizations (IOs). Riserless platform operations are conducted by the U.S. Implementing Organization (USIO), comprising the Consortium for Ocean Leadership, Inc., Texas A&M University through the Texas A&M Research Foundation, and Lamont-Doherty Earth Observatory of Columbia University. Riser platform operations are conducted by the Japan Agency for Marine-Earth Science and Technology through Japan's Center for Deep Earth Exploration in cooperation with the Center for Advanced Marine Core Research at Kochi University. Mission-specific platform operations are conducted by the European Consortium for Ocean Research Drilling (ECORD) Science Operator (ESO), comprising the British Geological Survey, the University of Bremen, and the European Petrophysics Consortium. The European IO currently represents the ocean-drilling efforts of 16 nations in Europe, plus Canada.

The discoveries presented in this volume build upon layers of knowledge and science developed over roughly the last fifty years. Expedition *Proceedings* are published by IODP Management International for IODP under the sponsorship of the U.S. National Science Foundation (NSF), Japan's Ministry of Education, Culture, Sports, Science and Technology, and other IODP members. The material is based upon research supported under Contract OCE-0432224 from NSF.

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Visual core descriptions (VCDs), smear slide data tables, thin sections, and core images are included in this section. VCDs, smear slides, and thin sections are combined into PDF files for each site. The entire set of core images in PDF is available in the IMAGES directory.

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## Site U1368

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

## Site U1369

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

## Site U1370

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

## Site U1371

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

# Expedition research results

## Data reports

Titles are available in [HTML](#).

## Syntheses

See “[Syntheses](#)” in the Expedition-related bibliography.

# Supplementary material

Supplementary material for this volume includes site reports from the KNOX-02RR site survey cruise in Word document format. See [README.TXT](#) in the SUPP\_MAT directory for a full listing of directories and files, or see the [Directory structure](#) for the names of the main subdirectories.

# Drilling location maps

A site map showing the drilling locations for this expedition and maps showing the drilling locations of all Integrated Ocean Drilling Program (IODP), Ocean Drilling Program (ODP), and Deep Sea Drilling Project (DSDP) drilling sites are available in PDF format. These maps were produced using Generic Mapping Tools (GMT) of Paul Wessel and Walter H.F. Smith ([gmt.soest.hawaii.edu/](http://gmt.soest.hawaii.edu/)).

[IODP Expedition 329 site map](#)

[IODP map](#) (Expeditions 301–329 and 331)

[ODP map](#) (Legs 100–210)

[DSDP map](#) (Legs 1–96)



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# Expedition-related bibliography

## IODP publications

### *Scientific Prospectus*

D'Hondt, S., Inagaki, F., and Alvarez Zarikian, C., 2010. South Pacific Gyre Microbiology. *IODP Sci. Prosp.*, 329. doi:10.2204/iodp.sp.329.2010

### *Preliminary Report*

Expedition 329 Scientists, 2011. South Pacific Gyre seafloor life. *IODP Prel. Rept.*, 329. doi:10.2204/iodp.pr.329.2011

### *Scientific Drilling journal\**

Pending

### *Proceedings volume*

D'Hondt, S., Inagaki, F., Alvarez Zarikian, C.A., and the Expedition 329 Scientists, *Proc. IODP*, 329: Tokyo (Integrated Ocean Drilling Program Management International, Inc.). doi:10.2204/iodp.proc.329.2011

Expedition 329 Scientists, 2011. Expedition 329 summary. In D'Hondt, S., Inagaki, F., Alvarez Zarikian, C.A., and the Expedition 329 Scientists, *Proc. IODP*, 329: Tokyo (Integrated Ocean Drilling Program Management International, Inc.). doi:10.2204/iodp.proc.329.101.2011

Expedition 329 Scientists, 2011. Methods. In D'Hondt, S., Inagaki, F., Alvarez Zarikian, C.A., and the Expedition 329 Scientists, *Proc. IODP*, 329: Tokyo (Integrated Ocean Drilling Program Management International, Inc.). doi:10.2204/iodp.proc.329.102.2011

Expedition 329 Scientists, 2011. Site U1365. In D'Hondt, S., Inagaki, F., Alvarez Zarikian, C.A., and the Expedition 329 Scientists, *Proc. IODP*, 329: Tokyo (Integrated Ocean Drilling Program Management International, Inc.). doi:10.2204/iodp.proc.329.103.2011

Expedition 329 Scientists, 2011. Site U1366. In D'Hondt, S., Inagaki, F., Alvarez Zarikian, C.A., and the Expedition 329 Scientists, *Proc. IODP*, 329: Tokyo (Integrated Ocean Drilling Program Management International, Inc.). doi:10.2204/iodp.proc.329.104.2011

Expedition 329 Scientists, 2011. Site U1367. In D'Hondt, S., Inagaki, F., Alvarez Zarikian, C.A., and the Expedition 329 Scientists, *Proc. IODP*, 329: Tokyo (Integrated Ocean Drilling Program Management International, Inc.). doi:10.2204/iodp.proc.329.105.2011

Expedition 329 Scientists, 2011. Site U1368. In D'Hondt, S., Inagaki, F., Alvarez Zarikian, C.A., and the Expedition 329 Scientists, *Proc. IODP*, 329: Tokyo (Integrated Ocean Drilling Program Management International, Inc.). doi:10.2204/iodp.proc.329.106.2011

Expedition 329 Scientists, 2011. Site U1369. In D'Hondt, S., Inagaki, F., Alvarez Zarikian, C.A., and the Expedition 329 Scientists, *Proc. IODP*, 329: Tokyo (Integrated Ocean Drilling Program Management International, Inc.). doi:10.2204/iodp.proc.329.107.2011

Expedition 329 Scientists, 2011. Site U1370. In D'Hondt, S., Inagaki, F., Alvarez Zarikian, C.A., and the Expedition 329 Scientists, *Proc. IODP*, 329: Tokyo (Integrated Ocean Drilling Program Management International, Inc.). doi:10.2204/iodp.proc.329.108.2011

Expedition 329 Scientists, 2011. Site U1371. In D'Hondt, S., Inagaki, F., Alvarez Zarikian, C.A., and the Expedition 329 Scientists, *Proc. IODP*, 329: Tokyo (Integrated Ocean Drilling Program Management International, Inc.). doi:10.2204/iodp.proc.329.109.2011

\*The Expedition-related bibliography is continually updated online. Please send updates to [PubCrd@iodp.tamu.edu](mailto:PubCrd@iodp.tamu.edu).

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Morono, U., Kallmeyer, J., Inagaki, F., and the Expedition 329 Scientists, 2011. Preliminary experiment for cell count using flow cytometry. *In* D'Hondt, S., Inagaki, F., Alvarez Zarikian, C.A., and the Expedition 329 Scientists, *Proc. IODP*, 329: Tokyo (Integrated Ocean Drilling Program Management International, Inc.). [doi:10.2204/iodp.proc.329.110.2011](https://doi.org/10.2204/iodp.proc.329.110.2011)

Hoppie, B., Bronk, T.R., and the Expedition 329 Scientists, 2011. Construction and first deployment of the *JOIDES Resolution's* Secchi discs. *In* D'Hondt, S., Inagaki, F., Alvarez Zarikian, C.A., and the Expedition 329 Scientists, *Proc. IODP*, 329: Tokyo (Integrated Ocean Drilling Program Management International, Inc.). [doi:10.2204/iodp.proc.329.111.2011](https://doi.org/10.2204/iodp.proc.329.111.2011)

D'Hondt, S., Abrams, L.J., Anderson, R., Dorrance, J., Durbin, A., Ellett, L., Ferdelman, T., Fischer, J., Forschner, S., Fuldauer, R., Goldstein, H., Graham, D., Griffith, W., Halm, H., Harris, R., Harrison, B., Hasiuk, F., Horn, G., Kallmeyer, J., Lever, M., Meyer, J., Morse, L., Moser, C., Murphy, B., Nordhausen, A., Parry, L., Pockalny, R., Puschell, A., Rogers, J., Schrum, H., Smith, D.C., Soffientino, B., Spivack, A.J., Stancin, A., Steinman, M., and Walczak, P., 2011. KNOX-02RR: drilling site survey—life in subseafloor sediments of the South Pacific Gyre. *In* D'Hondt, S., Inagaki, F., Alvarez Zarikian, C.A., and the Expedition 329 Scientists, *Proc. IODP*, 329: Tokyo (Integrated Ocean Drilling Program Management International, Inc.). [doi:10.2204/iodp.proc.329.112.2011](https://doi.org/10.2204/iodp.proc.329.112.2011)

## Syntheses\*

Pending

## Journals/Books\*

Pending

## Conferences\*

Pending

# Directory structure\*

|  |  |
|--|--|
| <b>329.PDF</b><br>(Preliminary pages and table of contents)  |  |
| <b>README.TXT</b><br>(Information about the Expedition Reports DVD-ROM)                            |  |
| <b>ACROREAD</b><br>(Acrobat Reader installation software and instructions for different platforms) | <b>MAC_OS</b>  |
|  | <b>WINDOWS</b>   |
|  | <b>UNIX</b>  |
|  | <b>README.TXT</b>  |
| <b>EXP_REPT</b><br>(Expedition Reports section of <i>Proc. IODP, 329</i> )                         | <b>CHAPTERS</b><br>(Expedition Reports chapters)   |
|  | <b>329_101.PDF</b> (Expedition 329 summary)  |
|  | <b>329_102.PDF</b> (Methods)   |
|  | <b>329_103.PDF</b> (Site U1365)  |
|  | <b>329_104.PDF</b> (Site U1366)  |
|  | <b>329_105.PDF</b> (Site U1367)  |
|  | <b>329_106.PDF</b> (Site U1368)  |
|  | <b>329_107.PDF</b> (Site U1369)  |
|  | <b>329_108.PDF</b> (Site U1370)  |
|  | <b>329_109.PDF</b> (Site U1371)  |
|  | <b>329_110.PDF</b> (Preliminary experiment for cell count using flow cytometry)  |
|  | <b>329_111.PDF</b> (Construction and first deployment of the <i>JOIDES Resolution's</i> Secchi discs)                  |
|  | <b>329_112.PDF</b> (KNOX-02RR: drilling site survey—life in subseafloor sediments of the South Pacific Gyre)           |
|  | <b>CORES</b><br>(Visual core descriptions, smear slide data tables, thin section data tables, and digital core images) |
| <b>CORU1365.PDF</b> (Site U1365)   |  |
| <b>CORU1366.PDF</b> (Site U1366)   |  |
| <b>CORU1367.PDF</b> (Site U1367)   |  |
| <b>CORU1368.PDF</b> (Site U1368)   |  |
| <b>CORU1369.PDF</b> (Site U1369)   |  |
| <b>CORU1370.PDF</b> (Site U1370)   |  |
| <b>CORU1371.PDF</b> (Site U1371)   |  |
| <b>IMAGES</b> (PDF files of core images)   |  |
| <b>SUPP_MAT</b><br>(Supplementary material)  | <b>KNOXRPTS</b>  |
|  | <b>SPG_SITE_REPORTS.DOC</b> (KNOX-02RR survey cruise size reports)   |
| <b>MAPS</b><br>(Drilling location maps)  | <b>README.TXT</b>  |
|  | <b>329_MAP.PDF</b><br>(Expedition 329 site map)  |
|  | <b>IODPMAP.PDF</b><br>(IODP map, Expeditions 301–329 and 331)  |
|  | <b>ODPMAP.PDF</b><br>(ODP map, Legs 100–210)   |
|  | <b>DSDPMAP.PDF</b><br>(DSDP map, Legs 1–96)  |

\*Directory structure reflects the Expedition Reports content and volume material produced on DVD-ROM.

