

**PALEOGENE EQUATORIAL TRANSECT  
SITES 1215–1222**



**VOLUME 199  
INITIAL REPORTS**

**PROCEEDINGS OF THE  
OCEAN DRILLING PROGRAM**

Prepared by the  
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TEXAS A&M UNIVERSITY,  
in cooperation with the  
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and  
JOINT OCEANOGRAPHIC INSTITUTIONS, INC.

# PROCEEDINGS OF THE OCEAN DRILLING PROGRAM

Volume 199

Initial Reports

Paleogene Equatorial Transect

Covering Leg 199 of the cruises of the Drilling Vessel *JOIDES Resolution*

Honolulu, Hawaii, to Honolulu, Hawaii

Sites 1215–1222

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Abbreviations for names of organizations and publications in ODP reference lists follow the style given in *Chemical Abstracts Service Source Index* (published by American Chemical Society).

The bulk of the shipboard-collected data from this leg is available on the World Wide Web and is accessible at [www-odp.tamu.edu/database](http://www-odp.tamu.edu/database). If you cannot access this site or need additional data, please contact the ODP Data Librarian, Ocean Drilling Program, Texas A&M University, College Station TX 77845-9547, USA. E-mail: [database@odpemail.tamu.edu](mailto:database@odpemail.tamu.edu).

Supplemental data on the volume CD-ROM were provided by the authors and may not conform to ODP publication formats.

Some close-up photographs of very dark cores have been tonally enhanced to better illustrate particular features of interest.

A site map showing the drilling locations for this leg and maps showing the drilling locations of all Ocean Drilling Program (ODP) and Deep Sea Drilling Project (DSDP) drilling sites are available on the volume CD-ROM 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)).

Cover photograph is of middle Eocene radiolarians from ODP Site 1217, Leg 199. Radiolarian oozes are the characteristic sediment of the Eocene in the eastern equatorial Pacific. Image taken by Isabella Raffi.

# FOREWORD

## BY JOINT OCEANOGRAPHIC INSTITUTIONS, INC.

This volume presents scientific and engineering results from the Ocean Drilling Program (ODP). These results address the scientific and technical goals of the program, which are focused on the study of the dynamics of Earth's interior and environment, the evolution of oceanic crust, and the fluctuations of climate. In addition, study of the Earth's deep biosphere is an emergent research objective.

ODP, an international partnership of scientists and research institutions from 22 countries, operates the drillship *JOIDES Resolution*. This state-of-the-art research vessel contains eight levels of laboratories and other scientific facilities required for carrying out the program's objectives.

The management of ODP involves a partnership of scientists and governments. International oversight and coordination are provided by the ODP Council, which is made up of representatives from the member countries. Overall scientific and management guidance is provided by representatives from the Joint Oceanographic Institutions for Deep Earth Sampling (JOIDES).

Joint Oceanographic Institutions, Inc. (JOI), a nonprofit consortium of 18 U.S. oceanographic institutions, serves as the National Science Foundation's prime contractor for ODP. JOI implements scientific objectives, plans, and recommendations of the JOIDES committees through major subcontracts to Texas A&M University (TAMU) for science operations and to Lamont-Doherty Earth Observatory (LDEO) of Columbia University for geochemical and geophysical well-logging services.

JOI, TAMU, and LDEO have worked together successfully for many years to manage the Ocean Drilling Program. We look forward to many exciting discoveries and continued international collaboration as we further our scientific mission, especially the planning for the future of ocean drilling beyond 2003.

Steven R. Bohlen

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The co-chiefs wish to express their thanks to the shipboard scientists who worked so hard to make the leg a scientific success and a special note of thanks to Tom Janecek, staff scientist and stratigraphic correlator, for juggling two jobs with such good humor. And, we thank Carlota Escutia for being willing, if not always able, to join in our adventure.

Finally, we thank those pioneering paleoceanographers and paleoclimatologists whose work on Paleogene problems continues to inspire our science.

# DEDICATION

To all our moms, mums, mamme, mutti, madres, mares, mamans, o-kaa-san, and moders.

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**14. Site 1221**

Shipboard Scientific Party

**15. Site 1222**

Shipboard Scientific Party

# CD-ROM CONTENTS: CORE DESCRIPTIONS

Visual core descriptions (VCDs) and smear slide data tables are included in this section. ASCII versions of the smear slide data tables are also available (see "[ASCII Tables](#)").

## Site 1215

[Visual Core Descriptions](#) · [Smear Slides](#)

## Site 1216

[Visual Core Descriptions](#) · [Smear Slides](#)

## Site 1217

[Visual Core Descriptions](#) · [Smear Slides](#)

## Site 1218

[Visual Core Descriptions](#) · [Smear Slides](#)

## Site 1219

[Visual Core Descriptions](#) · [Smear Slides](#)

## Site 1220

[Visual Core Descriptions](#) · [Smear Slides](#)

## Site 1221

[Visual Core Descriptions](#) · [Smear Slides](#)

## Site 1222

[Visual Core Descriptions](#) · [Smear Slides](#)

# CD-ROM CONTENTS: ASCII TABLES

This CD-ROM contains **ASCII** versions of selected biostratigraphy, paleomagnetism, geochemistry, and physical properties tables from the text and all of the **smear slide data tables** presented under “Core Descriptions.” A complete listing of the ASCII tables can be found listed below.

You can access these data directly from the PDF files. Depending on your computer platform, the following information applies.

## PC COMPUTERS

By default, double-clicking on a filename with a .TXT extension will launch the Notepad application. You can configure your computer’s operating system so that files on this CD with .TXT extensions automatically open in other software, such as Microsoft Excel. Follow these steps from the pull-down menu: Windows 95 and NT operating systems: View > Options > File Types; and Windows 98, 2000, ME, and XP systems: View > Folder Options > File Types.

## MACINTOSH COMPUTERS

All table files with .TXT extensions will automatically open into Excel. If you do not have Excel installed on your computer, you may view these files through other spreadsheet or text-editor programs. Open the application of your choice, select File > Open, and open the ASCII file.

## UNIX COMPUTERS

You can open files with .TXT extensions in any text editor or spreadsheet program but not directly from PDF files.

**Chapter 1**

**Chapter 2**

**Chapter 8**

**Chapter 9**

**Chapter 10**

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**Chapter 12**

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**Smear slide data tables**



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## CD-ROM CONTENTS: SUPPLEMENTARY MATERIAL

The *Initial Reports* CD-ROM contains supplementary data files presented as ASCII files and Microsoft Excel 97/98 spreadsheets. The files present expanded coring summary tables and information on the gamma ray attenuation, light absorption spectroscopy, natural gamma ray, *P*-wave logging, light reflectance, and magnetic susceptibility data. Supplementary material files are located in the SUPP\_MAT directory.

### CRSM

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## CD-ROM CONTENTS: DRILLING LOCATION MAPS

A site map showing the drilling locations for this leg and maps showing the drilling locations of all Ocean Drilling Program (ODP) and Deep Sea Drilling Project (DSDP) drilling sites are available in PDF format.

**ODP Leg 199 Site Map**

**ODP Map** (Legs 100–199)

**DSDP Map** (Legs 1–96)

## RELATED LEG DATA

### DOWNHOLE LOGGING AND CORE DATA

A second CD-ROM is included with this volume. The "Log and Core Data" CD contains Leg 199 depth-shifted and processed downhole logging data and shipboard core logging data (gamma ray attenuation bulk density, magnetic susceptibility, natural gamma radiation, *P*-wave velocity, moisture and density, and color reflectance). The downhole logging data are provided by the Borehole Research Group at the Lamont-Doherty Earth Observatory (LDEO), Wireline Logging Operator for ODP.

Most of the logging and core data included on this CD are available on the World Wide Web at [www.ldeo.columbia.edu/BRG/ODP](http://www.ldeo.columbia.edu/BRG/ODP). If you cannot access this site or want to order the CD, please contact the ODP Logging Services Operator at the Lamont-Doherty Earth Observatory of Columbia University, PO Box 1000, 61 Route 9W, Palisades NY 10964, USA; Tel: (845) 365-8341; Fax: (845) 365-3182; E-mail: [borehole@ldeo.columbia.edu](mailto:borehole@ldeo.columbia.edu).

The majority of the core data on the CD are available on the Web at [www-odp.tamu.edu/database](http://www-odp.tamu.edu/database). If you cannot access the ODP database or need additional data, please contact: ODP Data Librarian, Ocean Drilling Program, Texas A&M University, 1000 Discovery Drive, College Station TX 77845-9547, USA; Tel: (979) 845-8495; Fax: (979) 458-1617; E-mail: [database@odpemail.tamu.edu](mailto:database@odpemail.tamu.edu).

## COMPILED ELECTRONIC INDEX

The Compiled Electronic Index of the *Proceedings of the Ocean Drilling Program* included on the volume CD-ROM contains individual indexes of Volumes 101–173, 174B, 175, and 180. The indexes are contained in the directory titled ODPINDEX and are named ###NDX.PDF (### = the leg number). These indexes can be searched individually or collectively.

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	<b>WINDOWS</b>	
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	<b>README.TXT</b>	
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		<b>IR199_02.PDF</b> (Explanatory Notes)
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	<b>GRA</b> (Gamma ray attenuation [GRA] files in Microsoft Excel)	<b>GRA_1215</b> (Site 1215 files)
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	<b>LAS</b> (Light absorption spectroscopy [LAS] files in Microsoft Excel)	<b>LAS_1215</b> (Site 1215 file)
		<b>LAS_1216</b> (Site 1216 file)
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### README.TXT

## ODPINDEX

(Compiled Electronic Index of the *Proceedings of the Ocean Drilling Program*)

**101NDX.PDF through 173NDX.PDF, 174BNDX.PDF, 175NDX.PDF, and 180NDX.PDF**  
(Index files)

### NDX.PDX

(Acrobat file used to enable Acrobat Search of the Compiled Electronic Index)