Frontispiece. Seismic reflection profiles from the flanks of the Demerara Rise. A. High-resolution profile acquired during Meteor site survey M49-4, showing the shallow stratigraphy of Leg 207 target sediments (mid-Cretaceous and younger). B. Industry reflection profile showing faulted and folded Early Cretaceous synrift sediments overlain by mid-Cretaceous and younger sediments. Horizon C is a significant regional unconformity that marks the transition from synrift deposition and trans-tensional tectonics during the opening of the equatorial Atlantic to hemipelagic and pelagic deposition that includes Cretaceous and Paleogene critical intervals that are the focus of Leg 207. Horizon B’ relates to the top of the Cretaceous black shale sequence, and Horizon B correlates to the K/T boundary. Horizon A is an early Miocene erosional unconformity that removed much of the Neogene succession from the flanks of the Demerara Rise.
PROCEEDINGS OF THE
OCEAN DRILLING PROGRAM

Volume 207
Initial Reports
Demerara Rise: Equatorial Cretaceous and Paleogene
Paleoceanographic Transect, Western Atlantic

Covering Leg 207 of the cruises of the Drilling Vessel JOIDES Resolution
Bridgetown, Barbados, to Rio de Janeiro, Brazil
Sites 1257–1261
11 January–6 March 2003

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Reference to the whole or to part of this volume should be made as follows:

Print citation for Chapter 1:

CD-ROM volume citation:

CD-ROM chapter citation:

This volume also appears on the World Wide Web. See www-odp.tamu.edu/publications for Web citation formats.
Effective publication dates of ODP Proceedings

According to the International Code of Zoological Nomenclature, the date of publication of a work and of a contained name or statement affecting nomenclature is the date on which the publication was mailed to subscribers, placed on sale, or when the whole edition is distributed free of charge, mailed to institutions and individuals to whom free copies are distributed. The mailing date, not the printing date, is the correct one.

The printing date of this volume: March 2004

The mailing dates of recent Proceedings of the Ocean Drilling Program:
- Volume 204 (Initial Reports): November 2003
- Volume 205 (Initial Reports): November 2003
- Volume 206 (Initial Reports): December 2003
- Volume 177 (Scientific Results): March 2003
- Volume 183 (Scientific Results): June 2003
- Volume 186 (Scientific Results): October 2003

Copies of this publication may be obtained from Publications Distribution Center, Ocean Drilling Program, Texas A&M University, 1000 Discovery Drive, College Station TX 77845-9547, USA. See the ODP publication list at www-odp.tamu.edu/publications or contact ODP for prices and ordering information. Orders for copies require advance payment.

ISSN
Library of Congress 87-642-462
PUBLISHER’S NOTES

This volume also appears on the World Wide Web. Any scientific corrections, revisions, or additions will be noted in the chapter (see “Chapter Notes”) at www-odp.tamu.edu/publications.

This publication was prepared by the Ocean Drilling Program, Texas A&M University, as an account of work performed under the international Ocean Drilling Program, which is managed by Joint Oceanographic Institutions, Inc., under contract with the National Science Foundation. Funding for the program was provided by the following agencies at the time of this cruise:

Australia/Canada/Chinese Taipei/Korea Consortium for Ocean Drilling: Department of Primary Industries and Energy (Australia), Natural Resources Canada, National Taiwan University in Taipei, and Korean Institute for Geology, Mining and Minerals

Deutsche Forschungsgemeinschaft (Federal Republic of Germany)

European Science Foundation Consortium for Ocean Drilling (Belgium, Denmark, Finland, Iceland, Ireland, Italy, The Netherlands, Norway, Portugal, Spain, Sweden, and Switzerland)

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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 National Science Foundation, the participating agencies, Joint Oceanographic Institutions, Inc., Texas A&M University, or Texas A&M Research Foundation.

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. 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.

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

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

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).

Cover photograph (interval 207-1258B-53R-1, 8–28 cm) shows a Cretaceous black shale with concentrations of preserved fish debris and phosphoritic nodules (coproliths). The photograph was taken by ODP Photographer Cindi Prince.
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.

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*At completion of ODP cruises in September 2003. See Publisher’s Notes, p. 6, for list of funding agencies at time of cruise.
University of Washington, College of Ocean and Fishery Sciences

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Australia/Canada/Chinese Taipei/Korea Consortium for Ocean Drilling: Department of Primary Industries and Energy (Australia), Natural Resources Canada, National Taiwan University in Taipei, and Korean Institute for Geology, Mining and Minerals

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ACKNOWLEDGMENTS

The Scientific Party of Ocean Drilling Program (ODP) Leg 207 would foremost like to express their appreciation to the ODP shipboard technicians and shore-based support and publication staff. They make this program a success. Captain Tom Hardy and Transocean officers and crew and Catermar staff on the JOIDES Resolution provided exceptional shipboard services. Leg 207 was not only a success but a great experience because of their efforts. We would like to thank Shell EP International Ventures Inc. and, in particular, Tom Riddle for supplying industry seismic reflection data over the Demerara Rise. Efforts in reprocessing these data by Heinrich Meyer at the Federal Institute for Geosciences and Natural Resources, Germany, are greatly appreciated. Drs. Volkhard Spiess, Lars Zuehlsdorff, and Gerhardt Fischer of the University of Bremen and Captain Kull and crew of the expedition Meteor M49-4 acquired the site survey seismic and bathymetry data for Leg 207. These data and hence their efforts were invaluable to the project. We would like to thank the Extreme Climates PPG and the other ODP panels for supporting and providing valuable comments for the Leg 207 proposal. Walter Hale and staff at the Bremen Core Repository provided exceptional service for the postcruise sampling party—thank you.

Finally, the Leg 207 staff would like to thank Davey Jones and his SeaDog and King Neptune and his Royal Court for visiting the JOIDES Resolution to induct 27 dishonorable polywogs to the honorable league of Shellbacks at the Leg 207 equator crossing.
CD-ROM CONTENTS: CHAPTERS

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2. **Explanatory Notes**  
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3. **Site Survey and Underway Geophysics: Demerara Rise, Leg 207**  
   Shipboard Scientific Party

4. **Site 1257**  
   Shipboard Scientific Party

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6. **Site 1259**  
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9. **Microbial Gases in Black Shale Sequences on the Demerara Rise**  
   Philip A. Meyers, Astrid Forster, Helen Sturt, and the Leg 207 Shipboard Scientific Party

10. **Molecular Biogeochemistry of Cretaceous Black Shales from the Demerara Rise: Preliminary Shipboard Results from Sites 1257 and 1258, ODP Leg 207**  
    Astrid Forster, Helen Sturt, Philip A. Meyers, and the Leg 207 Shipboard Scientific Party
CD-ROM CONTENTS: CORE DESCRIPTIONS

Visual core descriptions (VCDs), smear slide and thin section data tables, and digital images are included in this section. VCDs, smear slide data tables, and thin sections are combined into one PDF file for each site. ASCII versions of the smear slide data tables are included in the VOLUME\TABLES directory (see “ASCII Tables”).

Site 1257

Visual Core Descriptions · Smear Slides · Thin Sections

Site 1258

Visual Core Descriptions · Smear Slides · Thin Sections

Site 1259

Visual Core Descriptions · Smear Slides · Thin Sections

Site 1260

Visual Core Descriptions · Smear Slides · Thin Sections

Site 1261

Visual Core Descriptions · Smear Slides · Thin Sections
CD-ROM CONTENTS: ASCII TABLES

The Initial Reports CD-ROM contains ASCII versions of edited paleomagnetism, $P$-wave velocity, and index properties data tables from the site chapters 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.

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Chapter 5 Chapter 8 Thin section data tables
Chapter 6
Chapter 4, Site 1257
Table T20. Index properties of discrete samples, Site 1257.
Table T21. Discrete measurements of $P$-wave velocity, Site 1257.

Chapter 5, Site 1258
Table T21. Index properties of discrete samples, Site 1258.
Table T22. Discrete measurements of $P$-wave velocity, Site 1258.

Chapter 6, Site 1259
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Table T22. Discrete measurements of $P$-wave velocity, Site 1259.

Chapter 7, Site 1260
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Table T21. Discrete measurements of $P$-wave velocity, Site 1260.

Chapter 8, Site 1261
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Table T20. Discrete measurements of $P$-wave velocity, Site 1261.
Smear Slide Data Tables
- Hole 1257A smear slide table.
- Hole 1257B smear slide table.
- Hole 1257C smear slide table.
- Hole 1258A smear slide table.
- Hole 1258B smear slide table.
- Hole 1258C smear slide table.
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- Hole 1260A smear slide table.
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Thin Section Data Tables
- Site 1257 thin section table.
- Site 1258 thin section table.
- Site 1259 thin section table.
- Site 1260 thin section table.
- Site 1261 thin section table.
CD-ROM CONTENTS: OVERSIZED MATERIAL

These oversized figures and tables are available on the volume CD-ROM in PDF format.

Chapter 4
**Figure F8.** Shipboard paleomagnetic data and initial interpretations of inclination clusters of the Oligocene–Cretaceous from Holes 1257A, 1257B, and 1257C.
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CD-ROM CONTENTS: SUPPLEMENTARY MATERIAL

The Initial Reports CD-ROM contains supplementary data files presented as Excel 97/98 spreadsheets. The files present expanded coring summary tables, MST splice tables, and radiolarian paleontological data. Supplementary material files are located in the SUPP_MAT directory.

COR_SUMM

1257ECS.XLS
1258ECS.XLS
1259ECS.XLS
1260ECS.XLS
1261ECS.XLS

MST_SPL

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README.TXT
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 207 Site Map
ODP Map (Legs 100–207)
DSDP Map (Legs 1–96)
RELATED LEG DATA

DOWNHOLE LOGGING AND CORE DATA

A CD-ROM containing processed logging data and a subset of core data is included with the printed version of this volume. However, a more complete set of the logging data collected by ODP Logging Services is available online at www.ldeo.columbia.edu/BRG/ODP/DATABASE/DATA/search.html. If you have problems downloading the data, wish to receive additional logging data, or have questions regarding the data, please contact: Data Services Manager, ODP Logging Services, 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; E-mail: logdb@ldeo.columbia.edu.

The majority of the core data on the CD are available on the Web at 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.

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 101–178, 180, 183, and 186. 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.
**CD-ROM Directory Structure**

| 207IR.PDF | (Preliminary pages and table of contents) |
| README.PDF | (Information about the volume CD-ROM) |
| README.TXT | (ASCII version of information about the volume CD-ROM) |

| ACRORREAD | (Acrobat Reader installation software and instructions for different platforms) |
| MAPS | (Drilling location maps) |
| 207_MAP.PDF | (Leg 207 site map) |
| ODPMAP.PDF | (ODP map, Legs 100 through 207) |
| DSDPMAP.PDF | (DSDP map, Legs 1 through 96) |

| VOLUME | (Leg 207 Initial Reports volume) |
| CHAPTERS | (Volume chapters) |
| IR207_01.PDF | (Leg 207 Summary) |
| IR207_02.PDF | (Explanatory Notes) |
| IR207_03.PDF | (Site Survey and Underway Geophysics) |
| IR207_04.PDF | (Site 1257) |
| IR207_05.PDF | (Site 1258) |
| IR207_06.PDF | (Site 1259) |
| IR207_07.PDF | (Site 1260) |
| IR207_08.PDF | (Site 1261) |
| IR207_09.PDF | (Microbial Gases) |
| IR207_10.PDF | (Hydrocarbon Biomarkers) |
| CORES | (Visual core descriptions, smear slide data tables, thin section data tables, and digital core images) |
| COR_1257.PDF | (Site 1257) |
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| COR_1259.PDF | (Site 1259) |
| COR_1260.PDF | (Site 1260) |
| COR_1261.PDF | (Site 1261) |
| IMAGES | (PDF files of core images) |
| IR207_04 | (Site 1257 files) |
| IR207_05 | (Site 1258 files) |
| IR207_06 | (Site 1259 files) |
| IR207_07 | (Site 1260 files) |
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| T_SECT | (Sites 1257 through 1261) |
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| OVERSIZE | (Large-format figures and tables) |
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| IR207_05 | (Site 1258 files) |
| IR207_06 | (Site 1259 files) |
| IR207_07 | (Site 1260 files) |
| IR207_08 | (Site 1261 files) |

| INDEX.PDX | (Acrobat file used to enable Acrobat Search of the Leg 207 Initial Reports) |

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