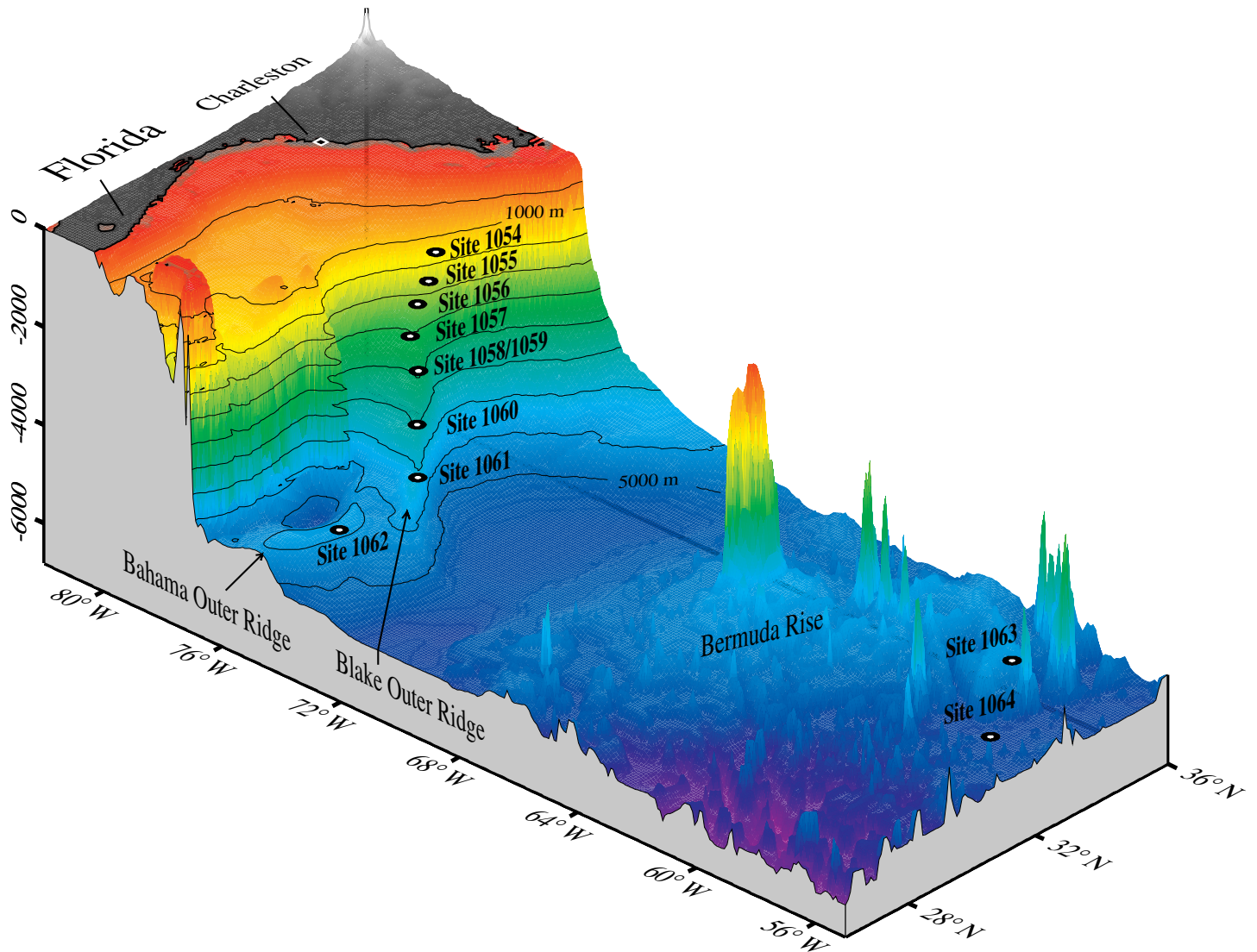


## **PROCEEDINGS OF THE OCEAN DRILLING PROGRAM**

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Frontispiece. Blake-Bahama Outer Ridge Transect.

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Volume 172

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Current policy requires that all figures published in *Scientific Results* volumes of the *Proceedings of the Ocean Drilling Program* be provided by the authors.

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).

This volume includes 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 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 of sunrise off the bow of the *JOIDES Resolution*, Atlantic Ocean, by ODP Photographer Roy Davis.

# 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 14 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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# PREFACE

## THE VOYAGES OF DISCOVERY

The *Scientific Results* volumes of the *Proceedings of the Ocean Drilling Program* are about Earth and her oceans.

These volumes contain contributions to a better understanding of the history of our planet through time. This exploration of Earth's past is based on scientific analyses of layers of strata sampled by the *JOIDES Resolution* at key locations throughout the global ocean. These volumes are a tribute to the scientific exploration carried out by the men and women who contributed to these voyages of discovery. Like the pioneering exploration and research of Captain Cook aboard the first *Resolution*, these volumes are a credit to the human spirit, which sees no boundaries.

The papers in this volume are published in a new online format that will be archived on CD-ROM. The *Proceedings* contents are available to students, scientists, and the public throughout the world. Volumes, once housed in the libraries of the member nations of ODP, are now published on the Internet for a worldwide audience and are also available in CD-ROM format. This electronic publication enables future investigators to gain easier access to the results of ocean drilling research. I acknowledge and thank the authors for their contributions and willingness to participate in this new venture.

Each *Scientific Results* volume has an Editorial Review Board that is responsible for obtaining peer reviews of papers submitted to the volume. This board usually is made up of the two co-chief scientists for the cruise, the ODP staff scientist for the cruise, and one external specialist who is familiar with the geology of the investigated area. ODP staff coordinate the peer-review process and also edit and produce each paper.

Each *Scientific Results* volume contains one leg synthesis paper and other peer-reviewed papers that present the results of extensive research in various aspects of scientific ocean drilling related to each leg. Each paper submitted to a *Scientific Results* volume undergoes rigorous peer review by at least two specialists in the author's research field. Volumes may also contain short reports of useful data. These Data Reports do not include interpretation of results and are peer-reviewed by at least one specialist. We seek to maintain a peer-review system comparable to those of the most highly regarded journals in the geological sciences.

To acknowledge the contributions made by this volume's Editorial Review Board, the Board members are designated Editors of the volume. Reviewers of manuscripts for this volume, whose efforts are so essential to the success of the publication, are listed without attribution to any particular manuscript.

On behalf of the Ocean Drilling Program, I extend sincere appreciation to the members of the Editorial Review Board and to the reviewers for generously contributing their time and effort. This process ensures that only papers of high scientific quality are published in the *Scientific Results* volumes.

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# CD-ROM CONTENTS: SYNOPSIS AND CHAPTERS

## An Overview of Leg 172 Literature

L.D. Keigwin and G.D. Acton

- 1. Data Report: Organic Geochemical Screening of a Bermuda Rise Sample from Site 1063**  
Lorraine B. Eglinton and Jean K. Whelan
- 2. Iron Oxidation in Sediment Cores (Site 1062) during Six Months of Storage in the Ocean Drilling Program Archive**  
I. König, A. Lougear, P. Bruns, J. Grützner, A.X. Trautwein, and W.-C. Dullo
- 3. Data Report: Carbon Isotopic Composition of Dissolved CO<sub>2</sub>, CO<sub>2</sub> Gas, and Methane, Blake-Bahama Ridge and Northeast Bermuda Rise, ODP Leg 172**  
Walter S. Borowski, Namik Cagatay, Yann Ternois, and Charles K. Paull
- 4. Data Report: Anisotropy of Magnetic Susceptibility Study of Quaternary Sediments from the Blake and Blake-Bahama Outer Ridges, Western North Atlantic**  
B. Haskell
- 5. A Detailed Characterization of Dansgaard-Oeschger Cycles at Site 1063 (Bermuda Rise)**  
G.B. Dunbar
- 6. High-Resolution Carbonate Content Estimated from Diffuse Spectral Reflectance for Leg 172 Sites**  
Liviu Giosan, Roger D. Flood, Jens Grützner, Sven-Oliver Franz, Maria-Serena Poli, and Sveinung Hagen
- 7. Sedimentary Structures of Contourites and Turbidites Observed by X-Radiographic Prints: Samples from Blake-Bahama Outer Ridge and Sohm Abyssal Plain**  
M. Yokokawa



**8. Data Report: Diatom Biostratigraphic Data and Plates from ODP Leg 172, Hole 1063D, with Brief Discussion of Present Ecological Affinities of Taxa**

Diane Winter

**9. Data Report: Late Pleistocene Stable Isotope Studies of ODP Sites 1054, 1055, and 1063**

L.D. Keigwin

**10. Brunhes Chron Magnetic Field Excursions Recovered from Leg 172 Sediments**

Steve P. Lund, Trevor Williams, Gary D. Acton, Brad Clement, and Mokoto Okada

**11. Paleomagnetic Records of Stage 3 Excursions, Leg 172**

Steve P. Lund, Gary Acton, Brad Clement, Makoto Okada, and Trevor Williams

## CD-ROM CONTENTS: OVERSIZE

This table is printed on the oversized foldout that is located in the front pocket of this publication. It is also available as an oversized table in PDF format on the *Scientific Results* CD-ROM included with this publication.

Chapter 8, **Table T4**. Biostratigraphic diatom data for Core 172-1063D-4H.

## CD-ROM CONTENTS: INDEX TO LEG 172 *INITIAL REPORTS AND SCIENTIFIC RESULTS* VOLUMES

The index covers both the *Initial Reports* and *Scientific Results* portions of Volume 172 of the *Proceedings of the Ocean Drilling Program*. The index contains a subject and taxonomic index.

[Index to Leg 172](#)

## CD-ROM CONTENTS: COMPILED ELECTRONIC INDEX

The Compiled Electronic Index of the *Proceedings of the Ocean Drilling Program* contains the indexes of Volumes 101–173 and 174B. 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. For information on using the Acrobat search function, see [“Searching a PDF Document”](#) in README.PDF.

## CD-ROM CONTENTS: DRILLING LOCATIONS 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 172 Site Map](#)

[ODP Map](#) (Legs 100–172)

[DSDP Map](#) (Legs 1–96)

# CD-ROM CONTENTS: DIRECTORY STRUCTURE

<b>172SR.PDF</b> (Preliminary pages and table of contents)		
<b>README.PDF</b> (Information about the volume CD-ROM)		
<b>README.TXT</b> (Information about the volume CD-ROM in ASCII format)		
<b>ACROREAD</b> (Acrobat Reader 4.0.5 installation software and instructions for different platforms)	<b>MAC</b>	
	<b>WINDOWS</b>	
	<b>UNIX</b>	
	<b>README.TXT</b>	
<b>MAPS</b> (Drilling locations maps)	<b>172_MAP.PDF</b>	(Leg 172 site map)
	<b>ODPMAP.PDF</b>	(ODP map, Legs 100 through 172)
	<b>DSDPMAP.PDF</b>	(DSDP map, Legs 1 through 96)
<b>VOLUME</b> (Leg 172 <i>Scientific Results</i> volume)	<b>SYNOPSIS</b> (Volume synopsis chapter)	<b>SR172SYN.PDF</b> (An Overview of Leg 172 Literature)
	<b>CHAPTERS</b> (Volume chapters)	<b>SR172_01.PDF</b> (Data Report: Organic Geochemical Screening of a Bermuda Rise Sample)
		<b>SR172_02.PDF</b> (Iron Oxidation in Sediment Cores [Site 1062])
		<b>SR172_03.PDF</b> (Data Report: Carbon Isotopic Composition of CO <sub>2</sub> , CO <sub>2</sub> Gas, and Methane)
		<b>SR172_04.PDF</b> (Data Report: Anisotropy of Magnetic Susceptibility)
		<b>SR172_05.PDF</b> (Characterization of Daansgard-Oeschger Cycles)
		<b>SR172_06.PDF</b> (High-Resolution Carbonate Content)
		<b>SR172_07.PDF</b> (Sedimentary Structures of Contourites and Turbidites)
		<b>SR172_08.PDF</b> (Data Report: Diatom Biostratigraphy)
		<b>SR172_09.PDF</b> (Data Report: Late Pleistocene Stable Isotope Studies)
		<b>SR172_10.PDF</b> (Brunhes Chron Magnetic Field Excursions)
		<b>SR172_11.PDF</b> (Paleomagnetic Records of Stage 3 Excursions)
	<b>OVERSIZE</b> (Large-format table)	<b>SR172_08</b> (Chapter 8 file)
	<b>172NDX.PDF</b> (172 <i>Proceedings</i> volume index)	
	<b>INDEX.PDX</b> (Acrobat file used to enable Acrobat Search of the 172 <i>Scientific Results</i> )	
<b>ODPINDEX</b> (Compiled Electronic Index of the <i>Proceedings of the Ocean Drilling Program</i> )	<b>101NDX.PDF through 173NDX.PDF and 174BNDX.PDF</b> (Index files)	
	<b>NDX.PDX</b> (Acrobat file used to enable Acrobat Search of the Compiled Electronic Index)	