



**CONSTRAINING MIOCENE SEA LEVEL CHANGE  
FROM CARBONATE PLATFORM EVOLUTION,  
MARION PLATEAU, NORTHEAST AUSTRALIA  
SITES 1192-1199**

**VOLUME 194  
INITIAL REPORTS**

**PROCEEDINGS OF THE  
OCEAN DRILLING PROGRAM**

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OCEAN DRILLING PROGRAM, TEXAS A&M  
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in cooperation with the  
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and  
JOINT OCEANOGRAPHIC INSTITUTIONS, INC.

# PROCEEDINGS OF THE OCEAN DRILLING PROGRAM

Volume 194

Initial Reports

Constraining Miocene Sea Level Change from Carbonate  
Platform Evolution, Marion Plateau, Northeast Australia

Covering Leg 194 of the cruises of the Drilling Vessel *JOIDES Resolution*  
Townsville, Australia, to Apra Harbor, Guam  
Sites 1192–1199

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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)).

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 a thin section of Sample 194-1196B-1R-1, 0 cm, by Co-Chief Scientist Flavio S. Anselmetti. The horizontal image width = 1 mm. Ferromanganese laminations of submarine hardground from the modern seafloor at 304 meters below sea level directly overlie the southern Marion platform edifice. This hardground surface formed after carbonate platform production ceased and the platform drowned in the late Miocene. Thereafter, strong bottom currents prevented deposition of Pliocene–Holocene sediments, favoring formation of hydrogenetic mineralizations.

# 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 16 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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# CD-ROM CONTENTS: CORE DESCRIPTIONS

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

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## CD-ROM CONTENTS: ASCII TABLES

This CD-ROM contains ASCII versions of all of the **smear slide data tables** and **thin section data tables** presented under “Core Descriptions.” A complete listing of the smear slide and thin section data tables can be found on the next page.

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

### WINDOWS 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.

[Smear slide data tables](#)

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### Smear Slide Data Tables

**Site 1192** smear slide table.

**Site 1193** smear slide table.

**Site 1194** smear slide table.

**Site 1195** smear slide table.

**Site 1197** smear slide table.

**Site 1198** smear slide table.

### Thin Section Data Tables

**Site 1192** thin section table.

**Site 1193** thin section table.

**Site 1194** thin section table.

**Site 1195** thin section table.

**Site 1196** thin section table.

**Site 1197** thin section table.

**Site 1198** thin section table.

**Site 1199** thin section table.



## CD-ROM CONTENTS: OVERSIZED FIGURES

These figures are printed on the oversized foldout that is located in the front pocket of this publication. They are also available as oversized figures in PDF format on the *Initial Reports* CD-ROM included with this publication.

### Chapter 1, Leg 194 Summary

**Figure F10A.** Parts of seismic sections MAR13, MAR20, MAR15, and MAR07 with locations of all Leg 194 sites.

**Figure F10B.** Stratigraphic correlation summary for Leg 194.

## CD-ROM CONTENTS: QUICKTIME MOVIES

This CD-ROM contains QuickTime movies for Figure **F3** in Chapter 4 and Figure **F3** in Chapter 7. These movies may be viewed from within the respective chapter PDF file or opened directly from the MOVIES directory. QuickTime 5 software is provided on the CD-ROM but is available only for the Macintosh and Windows platforms. Please see "**QuickTime Software**" in README.PDF for information on installing the software. Please see \QUIKTIME\**README.TXT** for information on minimum system requirements. QuickTime and the QuickTime logo are trademarks used under license. The QuickTime logo is registered in the U.S. and other countries.

## 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 194 Site Map**

**ODP Map** (Legs 100–194)

**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 194 depth-shifted and processed downhole logging data and shipboard core logging data (color reflectance, gamma ray attenuation bulk density, magnetic susceptibility, moisture and density, and natural gamma radiation). The downhole logging data are provided by the Borehole Research Group at the Lamont-Doherty Earth Observatory, 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.ideo.columbia.edu/BRG/ODP](http://www.ideo.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, Columbia University, Route 9W, Palisades NY 10964, USA; Tel: (845) 365-8341; Fax: (845) 365-3182; E-mail: [borehole@ideo.columbia.edu](mailto:borehole@ideo.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 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.

# CD-ROM DIRECTORY STRUCTURE

<b>194IR.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 location maps)	<b>194_MAP.PDF</b> (Leg 194 site map)	
	<b>ODPMAP.PDF</b> (ODP map, Legs 100 through 194)	
	<b>DSDPMAP.PDF</b> (DSDP map, Legs 1 through 96)	
<b>VOLUME</b> (Leg 194 <i>Initial Reports</i> volume)	<b>CHAPTERS</b> (Volume chapters)	<b>IR194_01.PDF</b> (Leg 194 Summary)
		<b>IR194_02.PDF</b> (Explanatory Notes)
		<b>IR194_03.PDF</b> (Site 1192)
		<b>IR194_04.PDF</b> (Site 1193)
		<b>IR194_05.PDF</b> (Site 1194)
		<b>IR194_06.PDF</b> (Site 1195)
		<b>IR194_07.PDF</b> (Sites 1196 and 1199)
		<b>IR194_08.PDF</b> (Site 1197)
		<b>IR194_09.PDF</b> (Site 1198)
	<b>CORES</b> (Visual core descriptions, smear slide and thin section data tables, and digital core images)	<b>COR_1192.PDF</b> (Site 1192)
		<b>COR_1193.PDF</b> (Site 1193)
		<b>COR_1194.PDF</b> (Site 1194)
		<b>COR_1195.PDF</b> (Site 1195)
		<b>COR96_99.PDF</b> (Sites 1196 and 1199)
		<b>COR_1197.PDF</b> (Site 1197)
		<b>COR_1198.PDF</b> (Site 1198)
		<b>IMAGES</b> (PDF files of core images)
<b>TABLES</b> (ASCII versions of smear slide and thin section data tables)	<b>S_SLIDES</b> (Sites 1192 through 1198)	
	<b>T_SECT</b> (Sites 1192 through 1199)	
	<b>README.TXT</b>	
<b>OVERSIZE</b> (Large-format figure)	<b>IR194_01</b> (Chapter 1 files)	
<b>MOVIES</b> (QuickTime movies)	<b>IR194_04</b> (Chapter 4 file)	
	<b>IR194_07</b> (Chapter 7 file)	
	<b>README.TXT</b>	
(Continued on next page)	<b>INDEX.PDX</b> (Acrobat file used to enable Acrobat Search of the 194 <i>Initial Reports</i> )	

## CD-ROM DIRECTORY STRUCTURE (CONTINUED)

### **ODPINDEX**

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

### **101NDX.PDF through 173NDX.PDF and 174BNDX.PDF**

(Index files)

### **NDX.PDX**

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

### **QUICKTIME**

(QuickTime 5.02 installation  
software and instructions for  
different platforms)

### **MAC**

### **WINDOWS**

### **README.TXT**

