

DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY

Sedimentary basin models documented on computer  
diskettes for USGS Bulletin 1810 the muPETROL Expert System  
for classifying world sedimentary basins

by

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Open-File Report 87-404

This documentation of computer-designed basin models recorded on computer diskettes is provided for USGS Bulletin 1810, The muPETROL Expert System for classifying world sedimentary basins, by Betty M. Miller, 1987, and has been reviewed for conformity with U.S. Geological Survey editorial standards.

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TABLE OF CONTENTS  
 FOR COMPUTER DISKETTES IN  
 OPEN-FILE REPORT 87-404

Content	File Name
Title and table of contents.....	OPEN
Sedimentary basin models using the Klemme world basin classification scheme for the muPETROL Expert System documented on computer diskettes.....	INTRO
Header file for the muPETROL Expert System.....	muPETROL.HDR
Introduction and Tutorial model.....	START.MDL
Transcript of a trial run of the Introduction and Tutorial model.....	TRIAL
Class I--Craton Interior Basins (model 1).....	CRATON.MDL
Class IIA--Craton Margin Composite Basins (model 2).....	IIAMARG.MDL
Class IIB--Craton-Accreted Margin Complex Basins (model 3).....	IIBCAMB.MDL
Class IIC--Crustal Collision Zone-Convergent Plate Margin Basins (model 4).....	CCZM.MDL
Class IIIA--Craton and Accreted Zone Rift Basins (model 5).....	CAZR.MDL
Class IIIB--Rifted Convergent Margin Basins (model 6).....	RCM.MDL
Class IIIC--Rifted Passive Margin Basins (model 7).....	RPM.MDL
Class IV--Delta Basins--Tertiary to Recent (model 8).....	DELTA.MDL
Class V--Forearc Basins (model 9).....	FOREAC.MDL

SEDIMENTARY BASIN MODELS USING THE KLEMME  
WORLD BASIN CLASSIFICATION SCHEME  
FOR THE muPETROL EXPERT SYSTEM

-DOCUMENTED ON COMPUTER DISKETTES-

INTRODUCTION

The prototype expert system muPETROL is comprised of sedimentary basin models constructed for nine sedimentary basin types or classes as defined by Klemme for a world sedimentary basin classification scheme (Klemme, 1980; written communication, 1985, 1987). In addition, an Introduction and Tutorial model is designed to aid in using the muPETROL expert system and also to familiarize the user with the basic geologic attributes and concepts used by Klemme for classifying world basins.

The basin models are encoded in a form compatible with muPROSPECTOR II (McCammon, 1986). An evaluation using muPETROL consists of a probabilistic estimate of the likelihood of occurrence of the basin type being considered, coupled with the reasons on which the evaluation is based. Each evaluation takes into account the geologic evidence judged favorable or unfavorable.

This documentation is intended for the reader who wishes to use the existing basin models in muPETROL or for those users who wish to build their own models.

SEDIMENTARY BASIN MODELS

The Introduction and Tutorial model and the nine sedimentary basin models are listed by the following basin identifications and file codes in the menu of options for the user to select in running the muPETROL expert system.

Name	Basin model number	File code
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An Introduction and Tutorial model		START.MDL
I. Craton Interior Basins	1	CRATON.MDL
II. Continental Multicycle Basins		
A. Craton Margin Composite	2	IIAMARG.MDL
B. Craton-Accreted Margin Complex	3	IIBCAMB.MDL
C. Crustal Collison Zone- Convergent Plate Margin "Tethyan"	4	CCZM.MDL
a) Closed		
b) Trough		
c) Open		

### III. Continental Rifted Basins

A. Craton and Accreted Zone Rift	5	CAZR.MDL
B. Rifted Convergent Margin "Pacific" a) Back arc b) Transform c) Median	6	RCM.MDL
C. Rifted Passive Margin "Atlantic" a) Parallel b) Transform	7	RPM.MDL
IV. Delta Basins--Tertiary to Recent a) Synsedimentary b) Structural	8	DELTA.MDL
V. Forearc Basins	9	FOREAC.MDL

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The computer listings, identified by file code, and the inference net diagrams for the Introduction and Tutorial model and for the nine sedimentary basin models are documented in U.S. Geological Survey Bulletin 1810 (Miller, 1987) in appendices B through L. A transcript of a trial run for Option 1 (Introduction and Tutorial model) is listed in Bulletin 1810 in appendix C-2. A source listing for the expert system shell used for muPETROL and adapted from the muPROSPECTOR II version was published by McCammon and others (1984, appendix C).

muPETROL is an operational prototype expert system presently consisting of 10 computer models designed to classify world sedimentary basins. These 10 models, encoded for the muLISP-muPROSPECTOR system and designed for an IBM-PC-XT/AT, are available to the public on MS-DOS formatted diskettes.

SEE ATTACHED DISKETTE.

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Directory of A:\OPEN FILE REPORT  
87-404

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START	MDL	41984	7-24-87	1:10p
CRATON	MDL	19328	7-24-87	1:10p
IIAMARG	MDL	13056	7-24-87	1:11p
IIECAMB	MDL	14848	7-24-87	1:12p
CCZM	MDL	36736	7-24-87	1:13p
CAZR	MDL	14848	7-24-87	1:13p
RCM	MDL	32128	7-24-87	1:14p
RPM	MDL	20864	7-24-87	1:14p
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FOREAC	MDL	19840	7-24-87	1:16p
TRIAL		12160	7-27-87	6:42a

14 File(s) 99328 bytes free