

TERRESTRIAL DEPOSITIONAL SYSTEMS

Deciphering Complexities
through Multiple
Stratigraphic Methods

Edited by

KATE E. ZEIGLER

Zeigler Geologic Consulting
Albuquerque, NM
United States

WILLIAM G. PARKER

Petrified Forest National Park
Petrified Forest, AZ
United States



CONTENTS

<i>Contributors</i>	<i>xi</i>
<i>Preface</i>	<i>xiii</i>
Building Local Biostratigraphic Models for the Upper Triassic of Western North America: Methods and Considerations	1
W.G. Parker, J.W. Martz	
Introduction	1
Constructing Local Stratigraphic Models	15
Acknowledgments	32
References	32
Revised Formulation of the Late Triassic Land Vertebrate “Faunachrons” of Western North America: Recommendations for Codifying Nascent Systems of Vertebrate Biochronology	39
J.W. Martz, W.G. Parker	
Introduction	40
The Path From Biostratigraphy to Biochronology	41
Proposed Reformulation of the Late Triassic Land Vertebrate “Faunachrons”	84
Application of Teilzone, Estimated Holochronozone, and Estimated Holochron Definitions	92
Discussion	106
Conclusions	111
Acknowledgments	113
References	113
Methods in Paleopalynology and Palynostratigraphy: An Application to the K-Pg Boundary	127
A. Bercovici, J. Vellekoop	
What Is Palynology?	127
The Major Groups of Palynomorphs and Their Application	128
Methods in Paleopalynology	136
A Case Study in Palynostratigraphy: The Cretaceous-Paleogene Transition	141
Conclusions	152
Acknowledgments	153
References	153
Further Reading	164

Sedimentologist's Guide for Recognition, Description, and Classification of Paleosols	165
N.J. Tabor, T.S. Myers, L.A. Michel	
Introduction	165
Recognition and Description	166
Classification	186
Conclusion	202
References	202
Overview of Methods in Paleomagnetism and Magnetostratigraphy for Terrestrial Strata	209
K.E. Zeigler, K.P. Kodama	
Introduction	209
Magnetization in Sedimentary Rocks	210
Sampling Schemes and Choice of Lithology	212
Sample Processing: To AF or to Thermal Demagnetize?	218
Rock Magnetism Experiments	219
Chemical Demagnetization	222
Quality of the Data: Statistical Analysis	223
Assessing the Possibility of Remagnetization	223
Developing a Magnetic Polarity Chronology and Wrestling With Correlations	225
Final Thoughts on Utilizing Paleomagnetic and Rock Magnetic Data	232
Acknowledgments	232
References	232
The Lower Chinle Formation (Late Triassic) at Petrified Forest National Park, Southwestern USA: A Case Study in Magnetostratigraphic Correlations	237
K.E. Zeigler, W.G. Parker, J.W. Martz	
Introduction	237
The Late Triassic Chinle Formation	238
Sampling and Analytical Methods	244
Paleomagnetic Results	248
Discussion	254
Conclusions	266
Acknowledgments	267
Appendix I	267
Appendix II	270
References	273

Magnetostratigraphy of the Upper Jurassic Morrison Formation at Dinosaur National Monument, Utah, and Prospects for Using Magnetostratigraphy as a Correlative Tool in the Morrison Formation **279**

S.C.R. Maidment, D. Balikova, A.R. Muxworthy

Introduction	280
The Morrison Formation	281
Paleomagnetism and Magnetostratigraphy	284
Previous Magnetostratigraphic Studies of the Morrison Formation	284
Methods	285
Results	288
Discussion	292
Conclusions	296
Acknowledgments	298
References	298

Terrestrial Carbon Isotope Chemostratigraphy in the Yellow Cat Member of the Cedar Mountain Formation: Complications and Pitfalls **303**

M.B. Suarez, C.A. Suarez, A.H. Al-Suwaidi, G. Hatzell, J.I. Kirkland, J. Salazar-Verdin, G.A. Ludvigson, R.M. Joeckel

Introduction	304
Continental Carbon Isotope Chemostratigraphy	305
Background Geology	305
Locality Descriptions	307
Methods	311
Results	312
Depositional Environment Interpretation	314
Carbon Isotope Correlations in the YCM	314
Discussion	317
Suggestions for Chemostratigraphic Studies	320
Correlation to Global C-Isotope Curves	323
Conclusion	324
Acknowledgments	326
Appendix I	326
References	332

<i>Index</i>	337
--------------	-----