

New Mexico GEOLOGY

May 2016
Volume 38, Number 2



New Mexico GEOLOGY

May 2016
Volume 38, Number 2

Latest Miocene-earliest Pliocene evolution of the ancestral Rio Grande at the Española-San Luis Basin boundary, northern New Mexico

Daniel J. Koning, Scott Aby, V.J.S. Grauch, Matthew J. Zimmerer.....24–49

Gallery of Geology—The youngest silicic eruptions from the Valles Caldera and volcanic hazard potential in north-central New Mexico

Giday WoldeGabriel, Rick Kelley, Elizabeth Miller, and Emily Schultz-Fellenz.....50–51



Cover Image

Confluence of the Rio Embudo and Rio Grande in the Rio Grande Gorge, looking upstream (towards the east). Photo courtesy of Paul Bauer. The gorge formed due to net incision of the Rio Grande during the late Pliocene and Pleistocene. The lead article of this volume uses dated basalts to interpret the river's history between 5.5 and 4.5 million years ago, prior to the development of the gorge. During that time period, two merging tributaries to the ancestral Rio Grande deposited a 10–25 m-thick package of gravelly sand as far as 14 km northeast of the present-day course of the river.

A publication of the
New Mexico Bureau of Geology and
Mineral Resources,
a division of the New Mexico Institute of
Mining and Technology

Science and Service
ISSN 0196-948X

New Mexico Bureau of Geology and Mineral Resources

Director and State Geologist
Matthew J. Rhoades, CPG, RG

Acting Geologic Editor: Steve Cather
Layout and Production Editor: Richard Arthur
Managing Editor: Gina D'Ambrosio

Cover image: Paul Bauer
Cartography & Graphics:
Leo Gabaldon and Stephanie Chavez

EDITORIAL BOARD

Dan Koning, *NMBGMR*
Penelope Boston, *NMIMT*
Barry S. Kues, *UNM*
Jennifer Lindline, *NMHU*
Gary S. Morgan, *NMMNHS*

New Mexico Institute of Mining and Technology

President
Daniel H. López

BOARD OF REGENTS

Ex-Officio
Susana Martinez
Governor of New Mexico

Dr. Barbara Damron
Secretary of Higher Education

Appointed
Deborah Peacock
President, 2011–2016, Albuquerque

Jerry A. Armijo
Secretary/Treasurer, 2015–2020, Socorro

David Gonzales
2015–2020, Farmington

Donald Monette
2015–2018, Socorro

Myissa Weiss, *student member*
2015–2016, Farmington

New Mexico Geology is an "electronic only" publication as of 2015. Each issue is available as a free PDF download from the New Mexico Bureau of Geology and Mineral Resources website. Subscribe to receive e-mail notices when each issue is available at: geoinfo.nmt.edu/publications/subscribe

Editorial Matter: Articles submitted for publication should be in the editor's hands a minimum of five (5) months before date of publication (February, May, August, or November) and should be no longer than 40 typewritten, double-spaced pages. All scientific papers will be reviewed by at least two people in the appropriate field of study. Address inquiries to Dan Koning, Geologic Editor, New Mexico Bureau of Geology and Mineral Resources, Socorro, New Mexico 87801-4750; phone (575) 835-6950.

Email: nmgeology@nmbg.nmt.edu
geoinfo.nmt.edu/publications/periodicals/nmg

