



# FOUR CORNERS GEOLOGICAL SOCIETY NEWSLETTER

May 2008

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# Four Corners Geological Society

## May Meeting and Presentation

**DATE:** Friday, May 16, 2008

**SPEAKER:** Dr. Ron Blakey, Professor of Geology, Northern Arizona University

**TOPIC:** Distal Record of Turbulent Tectonic Times, Pennsylvanian-Permian Deposition on the Southern and Western Colorado Plateau

**PLACE:** Fort Lewis College, 1000 Rim Drive, Durango, Colorado (970) 247-7010

**AGENDA:**

5:30 PM- Social Hour, **“Sub CUB Pub aka Extreme Room”**, in the College Union Building

6:30 PM- Dinner – Buffet of Grub

7:30 PM- Presentation

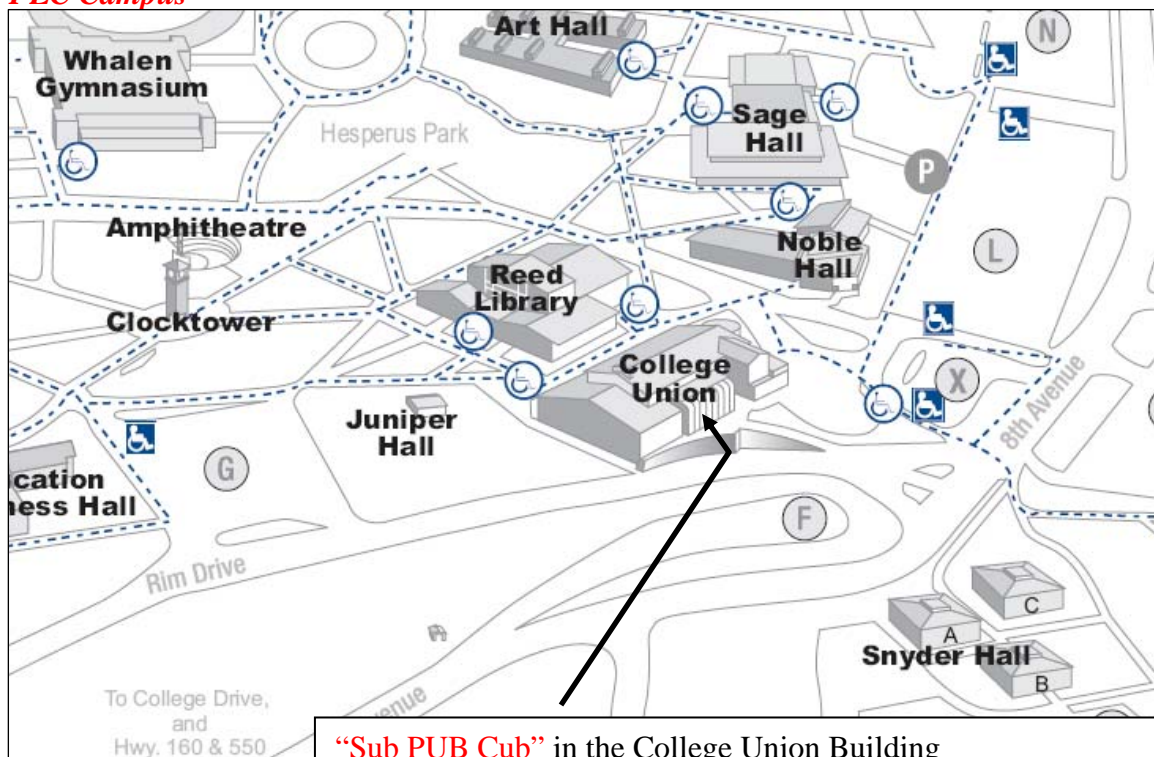
**COSTS:** \$20.00 per person (dinner and talk), \$2.00 per person (talk only), student’s free (talk only)

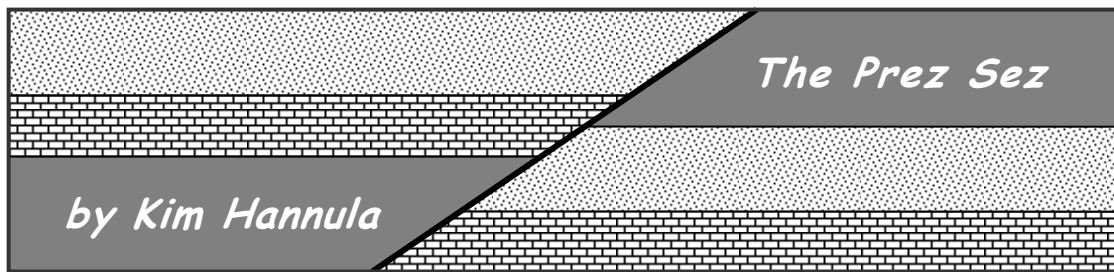
**Reservations** for this months meeting and presentation should be made by Wednesday, May 14.

**Farmington Contact:** Chip Head – email: [Chead1@earthlink.net](mailto:Chead1@earthlink.net) phone: (505) 320-6045

**Durango Contact:** Kim Hannula – email: [hannula\\_k@fortlewis.edu](mailto:hannula_k@fortlewis.edu) phone: (970) 247-7463

### *FLC Campus*





The last meeting of the year is coming up. That means that it's time to elect new officers. We will be voting at the May meeting, so please let me know if you are interested in volunteering for a position.

This month's meeting will be in Durango again, and will feature Dr. Ron Blakey of Northern Arizona University. You probably have seen Dr. Blakey's beautiful paleogeographic maps. If you haven't I recommend checking them out, at <http://jan.ucc.nau.edu/~rcb7/> . Dr. Blakey will be speaking about Pennsylvanian-Permian deposition on the southern and western Colorado plateau, its relationship to the Ancestral Rockies and to the more distant Appalachians.

Kim



## **DISTAL RECORD OF TURBULENT TECTONIC TIMES, PENNSYLVANIAN-PERMIAN DEPOSITION ON THE SOUTHERN AND WESTERN COLORADO PLATEAU**

**Dr. Ron Blakey, Department of Geology,  
Northern Arizona University**

Although the Colorado Plateau lies immediately adjacent to the Ancestral Rocky Mountains (ARM), only modest volumes of coarse detritus were deposited on the Plateau and only sand and mud reached distal areas to the south and west. However, parts of the Pennsylvanian and most of the Permian rocks are siliclastic units that record massive influxes of sedimentation across the Colorado Plateau. Rough calculations of volume of sediment indicate that much sand, silt, and mud was derived from sources other than ARM. Detrital zircon analyses confirm Appalachian and Gondwanan contribution for Permian sandstone and siltstone units. Paleogeographical constraints and paleocurrent data coupled with detrital zircon analyses suggest that large Appalachian rivers flowed NW across central North America, became desiccated along the western margin of the craton, and were deflated by northerly winds to supply huge volumes of eolian sand and loess southward to strata deposited on the Colorado Plateau. Coincidentally, sand, silt, and mud derived from ARM spread south and west and was mixed with Appalachian-derived detritus. The Plateau was a broad, low-lying, region mantled by eolian dunes, sluggish alluvial systems, and broad loess plains. During marine highstands, shallow marine carbonate and mudstone tongues penetrated across much of the region.

The geometry and distribution of Pennsylvanian-Permian sedimentary units described above document complex flexuring of the crust across the region. In some areas, rapid, short-lived subsidence is followed by periods of non-deposition and erosion; sedimentation in adjacent basins is commonly non-synchronous. Overall, sediment influx appears to be the most dominant control, at least during the Permian, as rates of continental sedimentation accumulation generally matched combined rates of subsidence and sea-level rise.

## BIOGRAPHICAL SKETCH

**RONALD C. BLAKEY**, Professor of Geology  
Department of Geology, Box 4099, Northern Arizona University, Flagstaff, AZ, 86011  
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### Professional Preparation:

Ph.D. in Geology University of Iowa, Iowa City 1973  
M.S. in Geology University of Utah, Salt Lake City 1970  
B.S. in Geology University of Wisconsin, Madison 1967

### Appointments:

1988-Present	Professor of Geology, Northern Arizona University
1990-1994	Chair, Department of Geology, Northern Arizona University
1981-1988	Associate Professor of Geology, Northern Arizona University
1981-1983	Consultant, U.S. Geological Survey, Flagstaff; Geology of Navajo Reservation
1975-1981	Assistant Professor of Geology, Northern Arizona University
1973-1975	Assistant Professor of Geology, Fort Hays, Kansas State University
1970-1973	Teaching Assistant, University of Iowa
1968-1970	Teaching Assistant, University of Utah

### Examples of recent publications:

- Blakey, R.C., Peterson, F., and Kocurek, G., 1988, Late Paleozoic and Mesozoic eolian deposits of the Western Interior of the United States: *Sedimentary Geology*, vol. 56, p. 3-125.
- Blakey, R.C., 1989, Triassic and Jurassic geology of southern Colorado Plateau: *in* Jenney, J.P. and Reynolds, S.J., *Geologic evolution of Arizona*, Arizona Geological Society Digest 17, p. 369-396.
- Blakey, R.C., 1994, Paleogeographic and tectonic controls on some Lower and Middle Jurassic erg deposits, Colorado Plateau, *in* Caputo, M.V., Peterson, J.A., Franczyk, J.J., (eds.), *Mesozoic systems of the Rocky Mountain region, USA: Rocky Mountain Section, Society of Economic Paleontologists and Mineralogists, Special Publication*, p. 273-298.
- Blakey, R.C., Havholm, K.G., and Jones, L.S., 1996, Stratigraphic analysis of eolian interactions with marine and fluvial deposits, Middle Jurassic Page Sandstone and Carmel Formation, Colorado Plateau, U.S.A.: *Journal of Sedimentary Research*, p. 324-342.
- Blakey, R. C., (in press), Pennsylvanian-Jurassic sedimentary basins of the Colorado Plateau and Southern Rocky Mountains in, Miall, A. D. (ed), *Sedimentary Basins of North America*: Elsevier, Amsterdam.
- Blakey, R.C., and Parnell, R.A., 1995, Middle Jurassic magmatism: the volcanic record in the eolian Page Sandstone and related Carmel Formation, Colorado Plateau, *in* Busby, C.J., and Miller, D.M., (eds.), *Jurassic magmatism and tectonics*

of the North American Cordillera: Geological Society of America Special Paper 199, p. 393-411.

Umhoefer, P.J. and Blakey, R.C., 2006, Moderate (1600 km) northward translation of Baja British Columbia from southern California: An attempt at reconciliation of paleomagnetism and geology, in Haggart, J.W., Enkin, R.J. and Monger, J.W.H., eds., Paleogeography of the North American Cordillera: Evidence For and Against Large-Scale Displacements: Geological Association of Canada, Special Paper 46, p. 305-327.

Blakey, R. C., 2007, Carboniferous-Permian paleogeography of the Assembly of Pangaea: in, Wong, Th.E (Ed.): Proceedings of the XVth International Congress on Carboniferous and Permian Stratigraphy. Utrecht, 10-16 August 2003. Royal Dutch Academy of Arts and Sciences (Amsterdam) p. 443-456.

Chan, M., D. Netoff, R. Blakey, G. Kocurek, and W. Alvarez, 2007, Clastic-injection pipes and syndepositional deformation structures in Jurassic eolian deposits: Examples from the Colorado Plateau, in A. Hurst and J. Cartwright, eds., Sand injectites: Implications for hydrocarbon exploration and production: AAPG Memoir 87, p. 233–244.

Miall, A. D., and Blakey, R. C., (in press) The Phanerozoic tectonic and sedimentary evolution of North America, in, Miall, A. D. (ed), Sedimentary Basins of North America: Elsevier, Amsterdam.

### **Synergistic Activities:**

- 1.** Web site on plate tectonics and Geology of Colorado Plateau <http://jan.ucc.nau.edu/~rcb7/> which is widely used by geologists, teachers, and students world-wide. Includes large database of material on Colorado Plateau geology.
- 2.** Paleogeographic maps of many regions and scales, including global, that are available free for educational and non-profit use. Last year I distributed over 1000 of these maps to universities, museums, and K-12 classrooms. See above website for examples of maps.
- 3.** I was part of first wave of educators to use World-wide web and computer presentations effectively in the classroom. Over 90% of my teaching is done using these technologies.
- 4.** Education in the media: 1) Plate tectonic maps and global geology – interviewed by Pioneer Productions (National Geographic, Naked Science) for three programs in last year; interviewed by Earth and Space (NPR radio program); paleogeographic maps used by Discovery Channel, National Geographic (publications and TV), History Channel. Interviewed by several newspapers and radio stations. 2) Geology of Colorado Plateau – interviewed for Naked Science series; interviewed by KJZZ (NPR, Phoenix).
- 5.** K-12 Education: routinely consulted by teachers and students for information on plate tectonics, paleogeography, and geology of Colorado Plateau.
- 6.** Service to industry: 1) Paleogeography – BP Petroleum, Unocal; 2) Geology of Colorado Plateau as related to Uranium resources – Plateau Resources, Union Pacific Resources, Energy Fuels Nuclear.



## General Announcements/News from other Geo-Societies

The **Rocky Mountain Section of the AAPG** and the Colorado Oil and Gas Association will present the “Rocky Mountain Energy Epicenter” at the Colorado Convention Center, July 9-11, 2008, and hosted by the RMAG. The Energy Epicenter theme recognizes the fact that the Rocky Mountains combine all critical aspects of unconventional oil and gas plays in the context of intense land-use and marketing issues that influence the economy of this country. For more information visit [www.rms-aapg.org](http://www.rms-aapg.org)

The **AAPG** will be offering over 50 short courses and field seminars from May 1, 2008 to June 20, 2008, designed with the goal of helping you explore and better understand the petroleum industry. For complete details on any of the field seminars and short courses offered by the AAPG, call +1 918 560-2650, or visit <http://www.aapg.org/education/>

The **Geothermal Resources Council** will hold its 2008 Annual Meeting October 5-8, 2008 at the Peppermill Hotel and Casino, Reno, Nevada. Contact and information: <http://www.geothermal.org/meet.html>

The **GSN Symposium** on the Great Basin Evolution and Metallogeny will be held May 14-22, 2010.

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# ROCKY MOUNTAIN **Energy Epicenter** 2008

**ENERGY SUMMIT  
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**JULY 9-11  
DENVER, CO**  
Colorado Convention Center

**Rocky Mountain Natural Gas Strategy  
Conference & Investment Forum**

Presented by Colorado Oil & Gas Association

**Rocky Mountain Geology &  
Energy Resources Conference**

Presented by Rocky Mountain Section AAPG

## Call for Papers, Exhibitors, Sponsors

Technical Sessions Include:

- \* Rockies O&G Resources
- \* Petroleum Systems
- \* Technology & Operations
- \* Reservoir Styles
- \* 3-D Seismic and Resource Plays
- \* Shale Gas Plays

### Contact:

Speakers: Mark Sonnenfeld [sonnenfeld@whiting.com](mailto:sonnenfeld@whiting.com)

Sponsors: Jim Emme [jim\\_emme@yahoo.com](mailto:jim_emme@yahoo.com)

Exhibitors: Brian Richter [berichter@aol.com](mailto:berichter@aol.com)



**FOR MORE INFORMATION**

Colorado Oil & Gas Association: [www.coga.org](http://www.coga.org)



ROCKY MOUNTAIN SECTION  
[www.rms-aapg.org](http://www.rms-aapg.org)

Rocky Mountain Section AAPG: [www.rms-aapg.org](http://www.rms-aapg.org)

The **GEOLOGICAL SOCIETY OF AMERICA** will hold a joint annual meeting and exposition October 5-9, 2008 in Houston, Texas. The meeting will be celebrating the International Year of the Planet Earth. The GSA will be joined by the Soil Science Society of America, the American Society of Agronomy, the Crop Science Society of America, The Gulf Coast Association of Geological Societies with the Gulf Coast Section SEPM, and will be hosted by the Houston Geological Society. The meeting will highlight and stimulate discussion in areas of the participating Societies' shared involvement including: energy, water resources, education, earth systems, and more. For additional information, contact: GSA: Darline Daley, 303-914-0695; ASA-CSSA-SSSA: Alexander Barton, 608-268-4947; GCAGS; Bruce Lemmon, 918-585-1004. For rates and on-line reservations go to: [www.geosociety.org/JointExhibits08.asp](http://www.geosociety.org/JointExhibits08.asp)

The **NEVADA PETROLEUM SOCIETY** announces the annual field trip for 2008. "The Sheep Pass Formation: Sedimentation and Tectonics Within the Late Cretaceous to Eocene Sevier Hinterland," led by Peter Druschke, University of Nevada, Las Vegas. Field Trip dates are May 31 through June 2, 2008. The NPS homepage is: <http://www.nbmng.unr.edu/nps/>

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The **NEW MEXICO GEOLOGICAL SOCIETY** announces its 2008 Fall Field Conference, mid-October in Silver City, New Mexico. The trip will focus on Eocene-Oligocene volcanism, Paleozoic and Precambrian stratigraphy, and ore deposits of the Gila Wilderness and in southwestern New Mexico. Greg Mack and Jim Witcher are the principal conveners of the 2008 conference. For information, go to the NMGS web site: <http://nmgs.nmt.edu/ffc/home.html>

**PTTC Technology Connections** of the Rocky Mountain Region presents the following upcoming workshops at the Colorado School of Mines:

*Petra Basics*, May 15, 2008

*Successfully Awakening Mature Oil Fields: The Process for Reversing Field Production Decline*, May 20, 2008

**Core Workshop:** Depositional Environments, Diagenesis, and Hydrothermal Alteration of the Mississippian Leadville Reservoir, Paradox Basin, Utah, May 23, 2008. To register online, go to [www.pttcrockeis.org](http://www.pttcrockeis.org) For more information, contact Mary Carr, 303-273-3107, [mcarr@mines.edu](mailto:mcarr@mines.edu)

The **RMAG/PTTC Symposium** and Short Course will take place September 23-24, 2008. Rocky Mountain “Dusters,” Lessons learned and Opportunities created will include stories of “near misses” that are the key to our future success. The one day symposium will consist of oral presentations and posters focused on learnings from significant dry holes and disappointing or economically challenged plays in the Rocky Mountain area. The second day will offer an optional Rick Management short Course. Abstracts will be due May 1, 2008. For ideas or questions, please contact Jim Emme at [jemme@elkresources.net](mailto:jemme@elkresources.net) (303-339-1949) or Mary Carr with PTTC at [mcarr@mines.edu](mailto:mcarr@mines.edu) (303-273-3107).

**Wyoming Geological Association  
Tooke Mudlog Collection**

The Wyoming Geological Association has mudlogs in the Rocky Mountain areas of Wyoming, Colorado and Utah that have been scanned. We are in the process of scanning other areas with the help of industry that contribute towards this project with their financial contributions. If you would like to see what is available please use our database located on our website at [www.wyogeo.org](http://www.wyogeo.org) and click on Mudlogs. The logs cost \$12.50 each and can be emailed to you if the log is small enough. Deeper well depths or several logs will require CD or DVD media for an additional fee. For more information contact Mary at [info@wyogeo.org](mailto:info@wyogeo.org) or call 307-237-0027.

The **SOCIETY OF INDEPENDENT PROFESSIONAL EARTH SCIENTISTS** will hold their 45<sup>th</sup> Annual Meeting and 2008 Convention on Oil and Prospecting May 12-15, 2008 in New Orleans, Louisiana. This event is co-sponsored by the SIPES National Organization and the SIPES New Orleans Chapter.

The **TATE Geological Museum** will hold the 14<sup>th</sup> Annual Symposium in Paleontology and Geology – “The Eocene Epic.” Kirk Johnson of the Denver Museum of Nature and Science will be the keynote speaker on June 5<sup>th</sup>. June 7<sup>th</sup> and 8<sup>th</sup> will be the field trips to visit Eocene areas in southwestern Wyoming. For information, call the Tate Museum at 307-268-2447, or write to the Tate Geological Museum, Casper College, 125 College Drive, Casper, WY, 82601. To register, go to:  
<http://nw4.caspercollege.edu/community/campus/tate/conference/index.html>

The **WYOMING GEOLOGICAL ASSOCIATION** invites you to meet in the Gem City of Laramie, Wyoming for the 2008 Annual Field Conference, September 3-7, 2008,

“Black Gold, Diamonds in the Rough, and Other Gems.” The WGA is soliciting presentations on topics relevant to the conference for presentation September 4 and 5, 2000. Deadline for abstracts is April 15, 2008. The range of subjects includes economic and general geology of southeastern Wyoming. Abstracts should be e-mailed to Alan Thompson at [alan@goolsbyfinley.com](mailto:alan@goolsbyfinley.com). Phone 307-266-3199. The WGA website is [www.wyogeo.org](http://www.wyogeo.org).

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Odd sizes are \$3.50 per column inch per month, minimum \$10.00

**For more information, please contact the FCGS Treasurer. Proceeds will go toward the further development of the Society (i.e., offset meeting costs, publications, etc.).**

**Four Corners Geological Society**

P.O. Box 1501, Durango, CO 81302

[www.fourcornersgeologicalsociety.org](http://www.fourcornersgeologicalsociety.org)

**2007-08 Officers**

**President** – Kim Hannula: Phone: 970.247.7463, e-mail: [hannula\\_k@fortlewis.edu](mailto:hannula_k@fortlewis.edu)

**President-Elect** – Charles Head: Phone: 505.320.6045, e-mail: [Chead@earthlink.net](mailto:Chead@earthlink.net)

**Secretary** – Stephanie Johnson: Phone: 970.247.1064, e-mail: [twilightgeo@frontier.net](mailto:twilightgeo@frontier.net)

**Treasurer** – James Hornbeck: Phone: 505.325.8874, email: [jmh@bmgdrilling.com](mailto:jmh@bmgdrilling.com)

**Book Chairperson** – Tom Ann Casey: phone: 505-326-3753, email: [tcasey@djsimmons.com](mailto:tcasey@djsimmons.com)

**Newsletter Editor** – Luke Titus: phone: 505.326.4242, email: [ltitus@cedarridgellc.com](mailto:ltitus@cedarridgellc.com)

**Past President**– Steve Hayden: phone: 505.334.6178, email: [steven.hayden@state.nm.us](mailto:steven.hayden@state.nm.us)

**Web Coordinator**– Doug Briggs: website: [www.rdbriggs.com](http://www.rdbriggs.com)

**Field Trip Coordinator**– Kim Gerhardt: Phone: 970.375.2700, e-mail: [kd@mydurango.net](mailto:kd@mydurango.net)

**Foundation President**– Joe Hewitt: phone: 505.599.6365, email: [jhewitt@blm.gov](mailto:jhewitt@blm.gov)

**Foundation Secretary** – Jim Hornbeck: phone: 505.325.8874, email: [jmh@bmgdrilling.com](mailto:jmh@bmgdrilling.com)

**Foundation Treasurer** – Gary Gianniny: phone: 970.247.7254, email: [gianniny\\_g@fortlewis.edu](mailto:gianniny_g@fortlewis.edu)